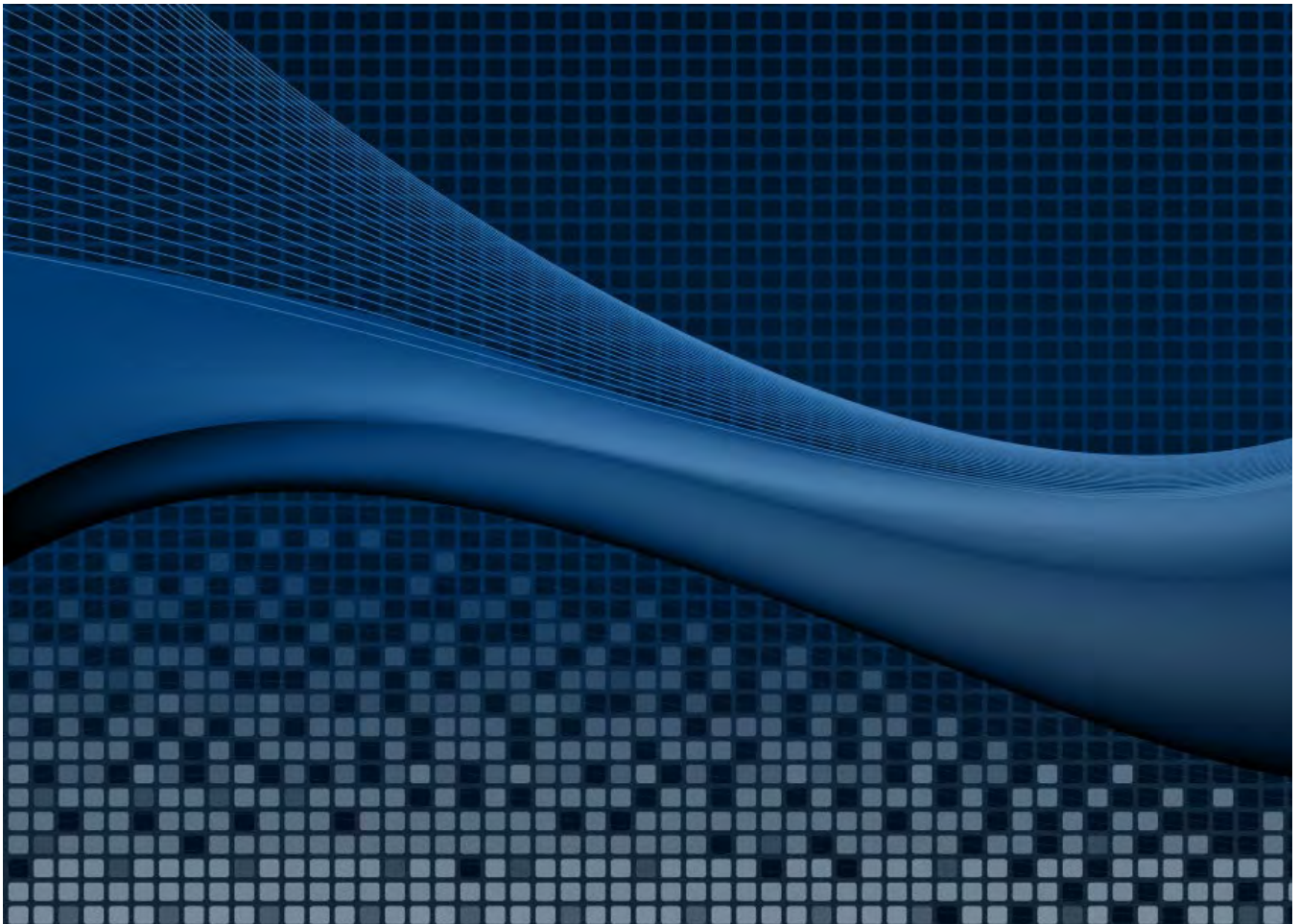




2021 Repetitive Loss Area Analysis

Public Document



City and County of Honolulu 2021 Repetitive Loss Area Analysis

July 2021

PREPARED FOR

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TABLE OF CONTENTS

PART 1— PLANNING PROCESS AND PROJECT BACKGROUND

- 1. Introduction..... 1-1
 - 1.1 Repetitive Loss Properties and the Community Rating System..... 1-1
 - 1.2 City & County of Honolulu Repetitive Loss Area Analysis 1-2
- 2. Repetitive Loss Area Analysis Methodology 2-1
 - 2.1 Basic Requirements..... 2-1
 - 2.2 Reverse Damage Function Methodology (Initial Identification)..... 2-1
 - 2.3 Secondary Identification..... 2-3
- 3. Repetitive Loss Areas Outreach..... 3-1
 - 3.1 CRS Outreach Requirements for RLAA 3-1
 - 3.2 RLAA Outreach Effort 3-1
 - 3.3 Repetitive Loss Area Specific Outreach..... 3-2
- 4. Relevant Programs and Regulations 4-1
 - 4.1 Relevant Federal and State Agencies, Programs and Regulations 4-1
 - 4.2 Local..... 4-3
- 5. Mitigated Repetitive Loss Properties 5-1
 - 5.1 Repetitive Loss List Correction..... 5-1
 - 5.2 Mitigated Repetitive Loss Properties 5-3
- 6. Mitigation Alternatives Considered..... 6-1
 - 6.1 Preventive..... 6-1
 - 6.2 Property Protection..... 6-2
 - 6.3 Natural Resource Protection..... 6-5
 - 6.4 Emergency Services 6-5
 - 6.5 Structural Projects 6-6
 - 6.6 Public Information..... 6-6
 - 6.7 Mitigation Measure Groupings..... 6-6

PART 2— ANALYSIS OF INDIVIDUAL REPETITIVE LOSS AREAS

- 7. Drainage Maintenance and/or Elevation..... 7-1
 - 7.1 Repetitive Loss Area No. 1 7-2
 - 7.2 Repetitive Loss Area No. 2 7-4
 - 7.3 Repetitive Loss Area No. 3 7-6
 - 7.4 Repetitive Loss Area No. 4 7-8
 - 7.5 Repetitive Loss Area No. 5 7-9
 - 7.6 Repetitive Loss Area No. 6 7-11
 - 7.7 Repetitive Loss Area No. 7 7-13
 - 7.8 Repetitive Loss Area No. 8 7-14
 - 7.9 Repetitive Loss Area No. 9 7-16
 - 7.10 Repetitive Loss Area No. 11 7-17
 - 7.11 Repetitive Loss Area No. 12 7-18
 - 7.12 Repetitive Loss Area No. 13 7-20
 - 7.13 Repetitive Loss Area No. 14 7-22

7.14 Repetitive Loss Area No. 15	7-24
7.15 Repetitive Loss Area No. 18	7-26
7.16 Repetitive Loss Area No. 20	7-28
7.17 Repetitive Loss Area No. 21	7-29
7.18 Repetitive Loss Area No. 22	7-31
7.19 Repetitive Loss Area No. 23	7-32
7.20 Repetitive Loss Area No. 24	7-33
7.21 Repetitive Loss Area No. 28	7-35
7.22 Repetitive Loss Area No. 30	7-37
7.23 Repetitive Loss Area No. 31	7-38
7.24 Repetitive Loss Area No. 33	7-40
7.25 Repetitive Loss Area No. 34	7-41
7.26 Repetitive Loss Area No. 35	7-42
7.27 Repetitive Loss Area No. 36	7-44
7.28 Repetitive Loss Area No. 37	7-45
7.29 Repetitive Loss Area No. 38	7-47
7.30 Repetitive Loss Area No. 39	7-48
7.31 Repetitive Loss Area No. 40	7-50
7.32 Repetitive Loss Area No. 41	7-52
7.33 Repetitive Loss Area No. 42	7-53
7.34 Repetitive Loss Area No. 44	7-55
7.35 Repetitive Loss Area No. 45	7-58
7.36 Repetitive Loss Area No. 46	7-60
7.37 Repetitive Loss Area No. 47	7-62
7.38 Repetitive Loss Area No. 50	7-65
7.39 Repetitive Loss Area No. 52	7-67
7.40 Repetitive Loss Area No. 55	7-69
7.41 Repetitive Loss Area No. 56	7-71
7.42 Repetitive Loss Area No. 57	7-73
7.43 Repetitive Loss Area No. 58	7-75
7.44 Repetitive Loss Area No. 59	7-77
7.45 Repetitive Loss Area No. 60	7-79
7.46 Repetitive Loss Area No. 61	7-81
7.47 Repetitive Loss Area No. 62	7-83
7.48 Repetitive Loss Area No. 63	7-86
7.49 Repetitive Loss Area No. 64	7-89
7.50 Repetitive Loss Area No. 65	7-92
7.51 Repetitive Loss Area No. 68	7-95
7.52 Repetitive Loss Area No. 69	7-98
7.53 Repetitive Loss Area No. 70	7-100
7.54 Repetitive Loss Area No. 71	7-102
7.55 Repetitive Loss Area No. 72	7-104
7.56 Repetitive Loss Area No. 73	7-106
7.57 Repetitive Loss Area No. 74	7-108
7.58 Repetitive Loss Area No. 75	7-110
7.59 Repetitive Loss Area No. 76	7-112

7.60 Repetitive Loss Area No. 77	7-113
7.61 Repetitive Loss Area No. 78	7-115
7.62 Repetitive Loss Area No. 79	7-117
7.63 Repetitive Loss Area No. 80	7-119
7.64 Repetitive Loss Area No. 82	7-121
7.65 Repetitive Loss Area No. 84	7-123
7.66 Repetitive Loss Area No. 85	7-125
8. Floodproofing (Non-Residential).....	8-1
8.1 Repetitive Loss Area No. 16	8-2
8.2 Repetitive Loss Area No. 25	8-5
8.3 Repetitive Loss Area No. 51	8-6
8.4 Repetitive Loss Area No. 54	8-8
8.5 Repetitive Loss Area No. 66	8-10
8.6 Repetitive Loss Area No. 83	8-12
PART 3— REPETITIVE LOSS AREA ACTION PLAN	8-1
9. Repetitive Loss Area Analysis.....	9-1
9.1 Mitigation Actions.....	9-1
9.2 Annual Evaluation Report	9-1
10. Plan Adoption	10-1
References	
Terminology	

Appendices

- Appendix A. Generic Depth-Damage Relationships for Residential Structures
- Appendix B. Letter to Repetitive Loss Area Residents
- Appendix C. Federal and State Agencies, Programs and Regulations
- Appendix D. RLAA Adoption Resolution

Figures

Figure 2-1. Foundation Types	2-4
Figure 4-1. Hazard Mitigation Planning Process.....	4-3
Figure 4-2. Geographic Regions of Honolulu	4-5
Figure 5-1. Example AW-501	5-2
Figure 6-1. Wet Flood-Proofing Example.....	6-4

City and County of Honolulu 2021 Repetitive Loss Area Analysis

PART 1—PLANNING PROCESS AND PROJECT BACKGROUND

1. INTRODUCTION

1.1 REPETITIVE LOSS PROPERTIES AND THE COMMUNITY RATING SYSTEM

A repetitive loss property is defined by the Federal Emergency Management Agency (FEMA) as a property for which two or more National Flood Insurance Program (NFIP) losses of at least \$1,000 each have been paid within any 10-year rolling period since 1978 (FEMA 2017). From 1978 through 2020, about a quarter of all claims paid under the NFIP nationwide were for repetitive loss properties, even though such properties make up fewer than 2 percent of all NFIP insurance policies (FEMA 2017).

Federal programs such as the Community Rating System (CRS) encourage communities to identify and mitigate the causes of repetitive losses. The first step is to map repetitive loss areas, which are contiguous areas that include one or more properties on FEMA's list of repetitive loss properties and all nearby properties with exposure to the same or similar flooding conditions. FEMA considers listed repetitive loss properties to be indicative of an overall repetitive loss problem that may affect other nearby properties. Designation of repetitive loss areas around listed repetitive loss properties allows an evaluation of actual or potential flooding problems at properties that may not have flood insurance or may have had only a single previous claim. This ensures that all properties with the same exposure to a flood risk are addressed equally.

1.1.1 Requirements for Category C Communities

The CRS, which provides for reduced flood insurance premiums in communities that carry out various flood mitigation activities, requires the following from participating communities with 50 or more repetitive loss properties (Category C communities):

- Prepare a map of repetitive loss areas.
- Review and describe each area's repetitive loss problem.
- Prepare a list of the addresses of all properties in the repetitive loss areas with insurable buildings, which are defined to include the following (FEMA 2020):
 - A structure that is affixed to a permanent site and has two or more outside rigid walls and a fully secured roof
 - A manufactured home (also known as a mobile home) built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation
 - A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws.
- Undertake an annual outreach project to those addresses.

- Prepare a floodplain management plan or area analysis for the repetitive loss areas.

1.1.2 The Repetitive Loss Area Analysis

FEMA prescribes the following five-step process for conducting an area analysis for repetitive loss:

- Step 1—Advise all the property owners in the repetitive flood loss area that the analysis will be conducted.
- Step 2—Contact agencies or organizations that may have plans that could affect the cause or impacts of the flooding.
- Step 3—Collect data on the analysis area and each building in it to determine the causes of the repetitive damage.
- Step 4—Review alternative mitigation approaches and determine whether any property protection measures or drainage improvements are feasible.
- Step 5—Document the findings in a report.

As required under Step 5, it provides the following information:

- A summary of the process followed
- Problem statements with maps for each area
- A table of basic information about each building in the area
- A description of alternative approaches considered to address the problem
- A set of recommended action items to address the problem

1.2 CITY & COUNTY OF HONOLULU REPETITIVE LOSS AREA ANALYSIS

The City & County of Honolulu prepared a Floodplain Management Plan in 2019. The plan addressed general flooding problems and identified possible solutions for individual homeowners. However, the plan did not include all required procedures for repetitive loss area analysis as outlined in the *Community Rating System Coordinator's Manual*. This report documents the fulfillment of the CRS requirements for Category C communities, following the five-step area-analysis process.

Individual properties and structures are counted and described in this document, but specific address information is withheld under the federal Privacy Act of 1974. A separate document on file with the City & County of Honolulu for internal use only correlates the property ID numbers presented here with specific address information.

FEMA's last report on October 20, 2020, designated 121 repetitive loss properties in the City & County of Honolulu. Corrections to this list, as described in Chapter 5, resulted in 101 properties included in the analysis. These properties have been mapped into 72 repetitive loss areas, and an analysis has been conducted for each area. Table 1-1 summarizes the properties, along with the dates of flooding events and the flood insurance claims filed for each since 1978. All of the RLPs suffered flooding damage at least twice in that period. As indicated by the flood zone information in Table 1-1, many RLPs in Honolulu are not within a mapped FEMA floodplain.

Table 1-1. Repetitive Loss Properties in the City & County of Honolulu

FEMA Repetitive Loss Property #	Claim History (Month/Year)	Flood Zone ^a	Total Claim Paid as of October 2020	Repetitive Loss Area # ^b
31478	1/80, 11/78	X	\$10,427.50	1
12813	9/92, 3/91, 1/88	A05	\$27,973.46	2
44110	12/87, 1/80	A	\$28,019.29	3
275897	2/18, 12/17	X	\$18,329	4
275397	2/18, 6/11	D	\$143,310	5
59540	4/18, 1/96, 12/87, 1/80	AE	\$76,330.83	6
184820	12/06, 3/06	X	\$39,195.22	7
281464	11/18, 2/18	D	\$57,815.88	8
47600	2/85, 12/80	A	\$4,647.23	9
199518	3/12, 6/11, 10/09	X	\$22,400.53	11
275891	2/18, 7/16	X	\$9,290.81	11
240401	7/14, 12/08	X	\$164,949.80	12
276345	10/17, 2/17	AE	\$193,391.77	13
59542	4/89, 1/82	C	\$38,638.60	14
212817	3/12, 3/06	X	\$123,656.88	15
76925	2/95, 9/92, 9/86	X	\$44,500.75	16
89962	6/19, 8/17, 7/16, 2/04, 3/04, 6/01, 11/96, 2/95	X	\$1,058,713.60	16
59551	12/87, 10/85	C	\$3,563.47	16
183997	12/08, 3/06	X	\$32,599.01	18
212478	7/14, 3/12, 12/08	X	\$51,659.80	20
165060	4/06, 2/04	X	\$9,202.26	21
164023	3/06, 2/04	X	\$6,603.46	21
54984	1/93, 2/85	C	\$23,469.91	21
127692	3/04, 11/96	A	\$23,787.54	22
31483	12/83, 1/80	A	\$4,916.94	23
240356, 239858, 240623, 240113	7/14, 3/20, 4/89, 3/06, 4/06, 7/14	AE/VE	\$113,558.78	24
59546	5/11, 10/92, 11/82	AE	\$22,176.75	25
31484, 212925	2/85, 3/12, 5/78, 12/10, 1/80	X	\$10,204.37	28
275972	11/18, 2/18, 7/16	X	\$23,988.68	30
276940	11/18, 2/18, 7/16	X	\$78,883	30
50322	12/87, 9/82, 10/81	AO	\$8,661.43	31
212582	3/12, 10/09	X	\$34,376.89	33
273440	12/21, 12/10	X	\$22,109.12	34
231329	3/12, 3/06	X	\$87,744.78	35
59550	3/91, 12/88	X	\$42,232.26	35
59543	11/90, 2/86	X	\$2,835.00	36
212552	3/12, 6/11	X	\$127,834.42	37
255985	2/17, 7/16	X	\$8,269.48	38
276301	2/18, 3/12	X	\$69,814.01	39
245657	11/15, 7/14	X	\$12,652.03	40

FEMA Repetitive Loss Property #	Claim History (Month/Year)	Flood Zone ^a	Total Claim Paid as of October 2020	Repetitive Loss Area # ^b
275416	12/17, 3/12	X	\$19,364.44	41
254249	8/16, 2/08	X	\$28,115.84	42
59556	7/14, 3/91, 1/88	AE	\$22,672.21	44
3451	3/91, 1/88	AE	\$7,075.37	44
9315	7/14, 3/06, 1/97, 11/96, 3/96, 2/94, 11/92, 3/91	AE	\$59,020.96	44
47244	12/87, 2/85	A	\$8,208.54	44
14692	2/94, 3/91, 1/88, 2/85, 11/84	V14	\$42,247.32	44
59555	7/14, 3/06, 2/94, 3/91, 1/88	AE	\$4,255.87	44
9168	12/92, 3/91, 2/85	A04	\$13,662.63	45
9169	3/06, 10/92, 3/91	AO	\$61,137.37	46
74993	3/12, 3/06, 3/91, 12/88	AO	\$69,375.59	46
9170	3/91, 11/90	VE	\$3,244.08	47
59548	4/18, 3/91, 12/87	AE	\$169,581.85	50
276700	4/18, 3/12	AE	\$238,558.38	50
59549	4/18, 9/92, 12/87	AE	\$77,040.95	50
276891	4/18, 3/12,	AE	\$388,112.10	50
14313	4/18, 9/92, 3/91, 1/88	AE	\$590,655.66	50
14317	11/00, 11/96, 2/95, 3/91, 12/90, 10/85, 2/85, 10/82, 3/80	A	\$207,365.34	51
15260	6/80, 1/80	A	\$12,678.46	51
14690	7/89, 2/83, 1/81, 3/80	V24	\$19,299.37	52
41778	12/90, 8/82, 1/81	AO	\$44,798.65	54
31475	8/82, 3/80	AO	\$104,757.18	54
31479	2/85, 3/82	A06	\$11,509.26	55
31481	12/87, 1/80	AH	\$21,605.92	56
31482	11/93, 3/91, 1/80, 10/78	AE	\$21,568.43	57
70822	4/18, 11/93, 10/92	AE	\$156,344.09	57
43233	3/91, 11/84	A	\$3,588.97	58
302309	11/96, 2/93	VE	\$9,508.14	58
56106	6/11, 12/08, 3/06, 5/02, 9/94 2/94, 3/91, 4/89, 12/87	V14	\$109,711.22	59
59544	2/17, 11/96, 3/91, 1/89	AE	\$75,174.81	60
59569	1/88, 1/80	AH	\$35,812.75	61
184995	3/12, 12/08, 3/91,	A	\$73,635.48	62
59577	3/91, 3/82, 1/82,	A	\$24,877.68	62
183398	12/08, 11/03, 12/95,	AH	\$67,123.94	62
59575	12/08, 3/91, 11/84,	A	\$45,607.43	62
59576	3/91, 3/82	A	\$24,276.26	63
182437	3/12, 12/08, 3/91	AH	\$63,247.59	64
59578	12/08, 2/94, 3/91, 1/88	AH	\$97,970.33	65
71411	8/15, 3/06, 3/94, 10/92	AE	\$272,852.53	66
81743	3/06, 11/96, 12/92	AO	\$77,417.36	68
163744	3/06, 10/04	AO	\$5,180.95	69
82286	11/96, 3/91	VE	\$184,759.76	70

FEMA Repetitive Loss Property #	Claim History (Month/Year)	Flood Zone ^a	Total Claim Paid as of October 2020	Repetitive Loss Area # ^b
83273	11/96, 10/91	AE	\$11,942.40	71
90445	2/97, 8/93	VE	\$27,056.77	72
127821	12/08, 3/04, 11/96	AE	\$25,147.04	73
138898	3/06, 1/05, 9/92	C	\$106,921.02	74
174279	2/18, 12/08, 11/07, 3/06,	AE	\$58,324.78	75
184112	12/08, 9/92,	AE	\$2,129,189.30	76
184723	12/08, 3/06	AE	\$4,818.31	77
190961	7/14, 11/09, 12/08	AE	\$63,675.07	78
192072	1/14, 12/13, 1/10, 1/83	VE	\$57,858.42	79
239982	7/14, 12/08	AE	\$46,639.59	80
36311	7/16, 3/06, 11/96, 3/94, 9/92, 12/88, 2/79	X	\$480,658.21	82
244654	8/15, 12/10	AE	\$11,129.38	82
246186	8/15, 5/11, 9/92, 2/79	AE	\$414,568.32	83
276258	4/18, 3/11,	AE	\$568,102.21	84
303239	12/88, 2/83	A04	\$6,123.32	85

a. Flood zones are defined as follows:

AE—Special hazard area inundated by the 1% annual chance flood with base flood elevation determined.

AH—Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones..

Shaded X—The area between the special hazard areas and the limits of the 0.2% annual chance floodplain.

X—The area determined to be outside the 0.2% annual chance floodplain.

b. After conducting the analysis of data and mapping of each area, 12 numbered areas were merged into another repetitive loss area (10, 17, 19, 26, 27, 29, 32, 43, 48, 49, 67, and 81). Their numbers have been omitted, but the remaining areas were not renumbered to account for the missing numbers. This will allow for future positioning should additional areas be identified over time.

2. REPETITIVE LOSS AREA ANALYSIS METHODOLOGY

2.1 BASIC REQUIREMENTS

There are two key sets of requirements to be met for a repetitive loss area analysis (RLAA):

- **Repetitive loss area mapping** requirements contained in Section 503 of the CRS Coordinator’s Manual and in the supplemental publication, *Mapping Repetitive Loss Areas* (FEMA 2015).
- **Building data collection** requirements contained in Section 512.b of the CRS Coordinator’s Manual (FEMA 2017):
 - Review each building in the repetitive loss area and collect basic data.
 - Collect data that is sufficient to make a preliminary determination of the cause of the repetitive flooding and of mitigation measures that would be appropriate to address the problem. This usually includes a review of drainage patterns around the building, the condition of the structure, and the condition and type of foundation.
 - The person conducting the review should not have to enter the property—adequate information should be collected from observations and other data.
 - Floor elevations or historical flood levels are not required, but can be helpful if available.
 - The date of each building’s insurance claim can help identify the cause of flooding (e.g., rainfall, hurricane or overbank flooding). The amount of the claim can help determine the amount of damage. Every community should request repetitive loss data including its historical insurance claims. This includes single-claim properties.

More information on building data can be found in *Selecting Appropriate Mitigation Measures for Floodprone Structures* (FEMA-551).

2.2 REVERSE DAMAGE FUNCTION METHODOLOGY (INITIAL IDENTIFICATION)

2.2.1 Rationale for Alternative Approach

For the City & County of Honolulu RLAA, building data collection requirements were met using an alternative to the approach outlined in the CRS Coordinator’s Manual. The RLAA planning team selected the alternative approach—a “reverse damage function” methodology—for initial identification of repetitive loss areas for the following reasons:

- The City & County of Honolulu received a formal update of its repetitive loss data from FEMA in October 2020 from FEMA Region IX. This was the last official dataset available for this RLAA.

- A Level 2, user-defined flood model using Hazus-MH, version 4.2 was constructed using State data. The County Assessor’s data provided key building attributes to model flood risk, such as date of construction, foundation type, occupancy class, and permit history. The detailed model data allowed the use of the selected alternative approach.

2.2.2 Description of Selected Approach

The selected reverse damage function approach used available data and capabilities to prepare the RLAA. The alternative approach achieves the same objectives as the approach prescribed in the 2017 CRS Coordinator’s Manual (Section 512b), while providing the City a better protocol for maintaining data in the future to identify properties in a defined repetitive loss area and determine the cause of repetitive flooding. This data can then be used for possible grant opportunities.

The reverse damage function approach is a quantitative process. It uses an existing model to apply the principles of the “depth-damage function,” which is the cornerstone of risk assessment in FEMA’s Hazus-MH and Benefit-Cost Analysis programs. Both of these programs estimate damage using curves that show the percentage of asset value that will be damaged as a function of the depth of floodwaters. These depth-damage curves are well-established as a basis for estimating losses caused by flooding.

The reverse damage function methodology uses known values of damage from a flood event, based on filed claims, to estimate what the floodwater depth was for that event. The following protocol was followed:

- Each repetitive loss property from the FEMA 2020 data set was mapped in GIS to look for possible groupings based on proximity. The GIS mapping was based on the LiDAR-generated digital elevation model. This digital elevation model has a 3-foot resolution.
- The average loss for each repetitive-loss (RL) property was determined by taking the average of all claims for that property.
- Replacement cost for each structure was calculated by applying the size and construction class for each RL property to the construction-cost-per-square-foot tables in *2015 BNi Home Builder’s Costbook* (Building News International, 2015).
- The percent damage “X” was calculated as:
$$X = Z \div Y$$

where:
X is the percent damage (to be determined)
Y is the replacement cost of the structure (based on assessor information)
Z is the estimated loss (based on the flood insurance claim)
- Once the percent damage was determined, the corresponding flood depth was determined by looking at the U.S. Army Corps of Engineers 2003 *Generic Depth-Damage Relationships for Residential Structures* (see Appendix A). These are the same damage functions contained in FEMA’s Hazus-MH and BCAR platforms. They represent projected flood depths above the top of the finished floor.
- The determined flood depth was applied to the repetitive loss structure. Using the foundation type determined using Google Street View Pro and assuming crawl space foundations for any structures not visible in that application, the depth was added to the top of the finished floor. For a structure with a slab foundation, the top of the finished floor was set at 8 inches above adjacent grade. For a structure with a crawlspace foundation, the finished floor was set at 24 inches above adjacent grade. These parameters are

based on standard building practices. None of the RL properties were shown to have basements, according the analysis.

- Once the depth was applied to the finished floor, it was extended across the digital elevation model until it ran to zero depth (high ground) and a boundary was delineated. These boundaries were projected north, south, east and west for each property. In areas with multiple RL properties, the property with the highest depth above finished floor was used for this exercise.
- The boundary for each repetitive loss area was intersected with an ortho-photo and parcel boundary map. Each parcel with a structure within the delineated boundary was determined to be a property potentially subjected to repetitive flooding and was added to a repetitive loss list for the City.
- Property condition assessments were included in existing assessor's data, which were used for this RLAA.

Utilizing this methodology, 72 repetitive loss areas were delineated. Maps and descriptions of the causes of flooding for each area can be found in Chapters 7 and 8.

The final step was to determine the cause of flooding, giving consideration to the following findings from the initial identification:

- 23 RL properties were identified as “not being an actual RL property” because the original structure had been replaced with a new post-FIRM structure at appropriate elevation, the structure had been torn down so that the property is now vacant, and/or the loss was caused by a 100-year or great storm. Correction worksheet has been submitted to FEMA.
- 65 properties are in a FEMA-designated 100-year flood zone.
- 23 properties are in a FEMA-designated 500-year flood zone.
- 24 percent had more than three or more claims and 76 percent had two claims per property.
- The average claim paid was \$111,123.93. The highest average claim per property was \$2,129,189.30 and the lowest was \$3,563.47.
- The average replacement cost for the RL properties was \$1,080,957. Two of the properties have replacement cost values of over \$10,000,000. The average replacement cost for the RL properties excluding the two properties was \$640,604.

The planning team concluded that the majority of the repetitive losses are associated with localized urban/hillside drainage flood problems, even for properties within a FEMA-designated flood zone. There is no record of costly loss events that would indicate the maximum flood risk reflected in FEMA mapping.

2.3 SECONDARY IDENTIFICATION

Once the initial identification of the repetitive loss areas was completed using the reverse-damage-function methodology, the planning team performed a secondary review of each repetitive loss area based on three questions about each area:

- Is there really a repetitive loss problem in this area, based on local knowledge?
- Does the list of properties make sense based on what we know about the area?
- Does the City have any additional qualifying data on the area to justify adding or removing properties?

This secondary review included the following aspects of each structure considered for inclusion in a repetitive loss area:

- **Structure condition**—To assess the condition of the structures in the repetitive loss areas, the planning team relied on the Honolulu Assessor’s data.
- **Foundation type**—In the City & County of Honolulu, there are generally four types of foundations (see Figure 2-1):
 - A slab foundation is usually concrete poured directly onto the ground. This type of foundation uses concrete rather than wood to help support the weight of the home.
 - A crawlspace, or raised foundation, is built above the ground, with just enough room to crawl underneath. There are stem walls on the perimeters, pierced in-between, with a girder system and floor joists on top of that. The foundation is high enough to leave at least 2 feet below to crawl into for access to the home’s mechanical systems.
 - Elevated structure supporting beams and columns with lowest floor above the FEMA elevation.
 - Elevated structure with enclosure (allowed based on zoning and enclosure size).

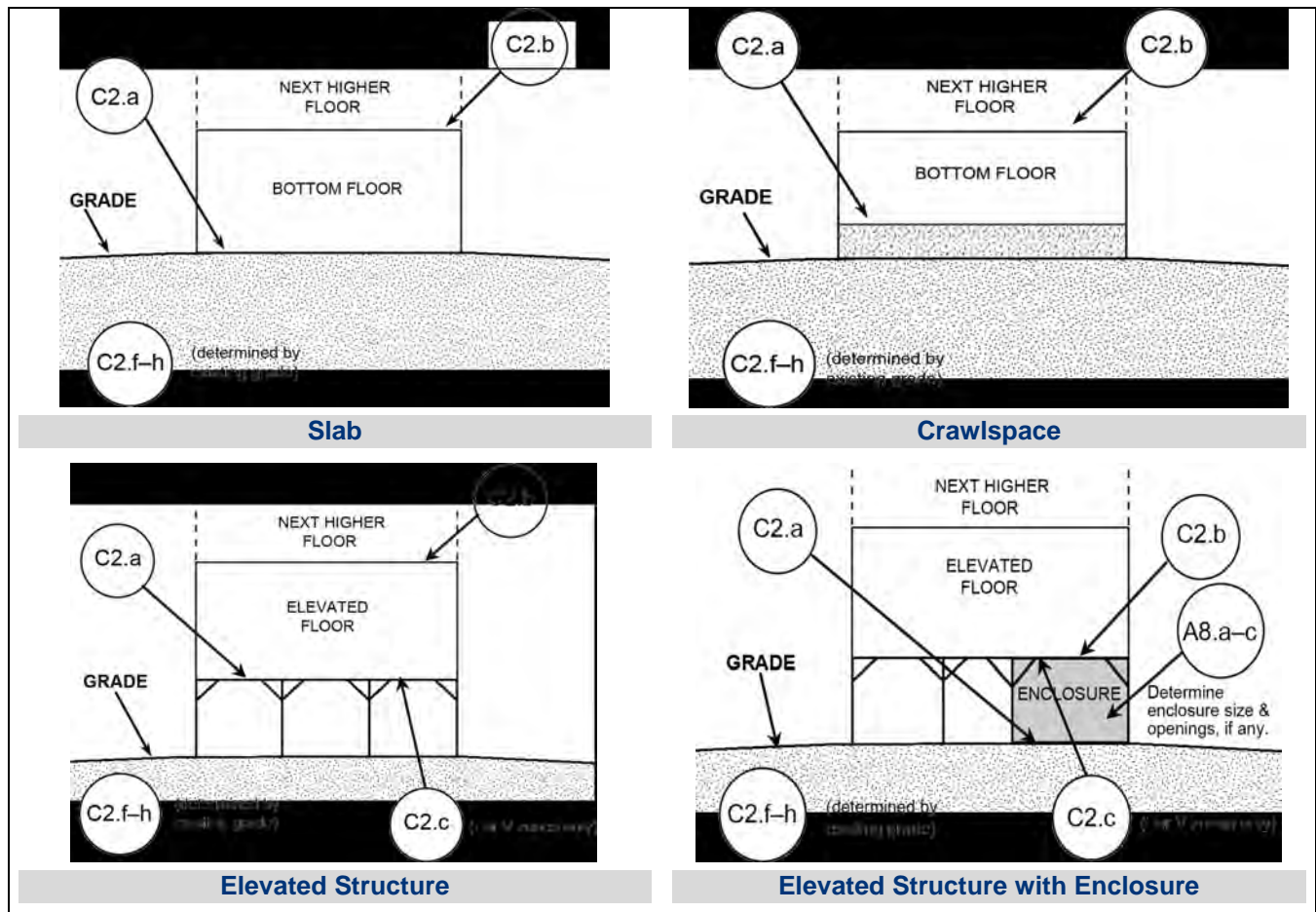


Figure 2-1. Foundation Types

Adjustments were made after applying this review to each repetitive loss area. Based on the analysis, there are 529 properties in 72 repetitive loss areas. This became the final repetitive loss area mailing list for the City & County of Honolulu.

Many properties outside the special flood hazard area do not have flood insurance and are not required to do so. However, structures identified in the analysis as having conditions similar to those of FEMA-identified RL properties will be encouraged to seek insurance as part of the City outreach.

3. REPETITIVE LOSS AREAS OUTREACH

3.1 CRS OUTREACH REQUIREMENTS FOR RLAA

RLAA Step 1 (2017 CRS Coordinator's Manual Section 512.b) requires notification that an analysis is being conducted to all properties in the repetitive loss areas, with a request for input on the hazard and recommended actions. The notice (or any public document) must not identify which properties are on FEMA's repetitive loss list. There are no restrictions on publicizing what properties are in repetitive loss areas that have more than one property and there are no restrictions on publishing aggregate data, such as how many properties received claims or the average value of those claims. Planning staff may share insurance claim information with the owner of a property but may not make it available to anyone else.

- The notice can be sent to owners OR residents, at the community's discretion, as long as a representative of each property is notified.
- The notice cannot be done via a newspaper or newsletter notice or article.
- The notice must advise the recipients when and how copies of the draft report can be obtained and ask for their comments on the draft.

Several methods were deployed to engage repetitive loss area property owners during the course of this RLAA process. This chapter highlights those efforts.

RLAA Step 2 requires contact with agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The analysis report must identify contacted agencies and organizations.

3.2 RLAA OUTREACH EFFORT

This Repetitive Loss Area Analysis is considered by the City & County of Honolulu Resilience Office to meet the prerequisite of the CRS. After consulting with ISO and the courtesy review of the hazard mitigation plan, it was determined the RLAA was required. Further discussion with FEMA Region IX State DNR and the CRS contractor, Tetra Tech, a coordinated effort with below listed agencies for their input to satisfy RLAA Step 2. A single letter has been sent to all FEMA repetitive loss and similar properties near the repetitive loss property for comments and or suggestions relating to the analysis. All precautions have been taken to observe and follow the Privacy Act.

3.2.1 Contact with Agencies and Organizations

The following agencies, as direct stakeholders within the planning area, were invited to participate in the plan development. Whether they participated or not, they were kept apprised of plan development milestones:

- State of Hawaii DNR
- Hawaii Office of Emergency Services
- FEMA Region IX
- University of Hawaii, Sea Grant
- Hawaii Office of Climate Change, Sustainability and Resiliency

3.3 REPETITIVE LOSS AREA SPECIFIC OUTREACH

Upon the completion of a draft of this report, the City & County of Honolulu Office of Resilience disseminated a letter to residents in each repetitive loss area informing them of this report, where and how they would be able to review it, and where and how they might submit comments regarding it. The communication document is shown in Appendix B.

4. RELEVANT PROGRAMS AND REGULATIONS

Existing laws, ordinances and plans at the federal, state and local level can support or impact hazard mitigation initiatives identified in this plan. Hazard mitigation plans are required to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process, as stated in 44 CFR, Section 201.6(b)(3). Pertinent federal, state, and local laws are described below.

4.1 RELEVANT FEDERAL AND STATE AGENCIES, PROGRAMS AND REGULATIONS

State and federal regulations and programs that need to be considered in hazard mitigation are constantly evolving. For this plan, a review was performed to determine which regulations and programs are currently most relevant to hazard mitigation planning. The findings are summarized in Table 4-1 and Table 4-2. Additional information is provided in Appendix C.

Table 4-1. Summary of Relevant Federal Agencies, Programs and Regulations

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
Americans with Disabilities Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Bureau of Land Management	Wildfire Hazard	The Bureau funds and coordinates wildfire management programs and structural fire management and prevention on Bureau lands.
Civil Rights Act of 1964	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Clean Water Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Community Development Block Grant Disaster Resilience Program	Action Plan Funding	This is a potential alternative source of funding for actions identified in this plan.
Community Rating System	Flood Hazard	This voluntary program encourages floodplain management activities that exceed the minimum National Flood Insurance Program requirements.
Disaster Mitigation Act	Hazard Mitigation Planning	This is the current federal legislation addressing hazard mitigation planning.
Emergency Relief for Federally Owned Roads Program	Action Plan Funding	This is a possible funding source for actions identified in this plan.
Emergency Watershed Program	Action Plan Funding	This is a possible funding source for actions identified in this plan.
Endangered Species Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Federal Energy Regulatory Commission Dam Safety Program	Dam Failure Hazard	This program cooperates with a large number of federal and state agencies to ensure and promote dam safety.

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
Federal Wildfire Management Policy and Healthy Forests Restoration Act	Wildfire Hazard	These documents mandate community-based collaboration to reduce risks from wildfire.
Hazard Mitigation Assistance Grant Programs	Action Plan Implementation	These programs are potential sources of funding for the implementation of mitigation actions recommended in this plan
National Dam Safety Act	Dam Failure Hazard	This act requires a periodic engineering analysis of most dams in the country
National Environmental Policy Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
National Fire Plan (2001)	Wildfire Hazard	This plan calls for joint risk reduction planning and implementation by federal, state and local agencies.
National Flood Insurance Program	Flood Hazard	This program makes federally backed flood insurance available to property owners in exchange for communities enacting floodplain regulations
National Incident Management System	Action Plan Development	Adoption of this system for government, nongovernmental organizations, and the private sector to work together to manage incidents involving hazards is a prerequisite for federal preparedness grants and awards
Presidential Executive Order 11988, Floodplain Management	Flood Hazard	This order requires federal agencies to avoid long and short-term adverse impacts associated with modification of floodplains
Presidential Executive Order 11990 (Protection of Wetlands)	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable presidential executive orders.
U.S. Army Corps of Engineers Dam Safety Program	Dam Failure Hazard	This program is responsible for safety inspections of dams that meet size and storage limitations specified in the National Dam Safety Act.
U.S. Army Corps of Engineers Flood Hazard Management	Flood Hazard, Action Plan Implementation, Action Plan Funding	The Corps of Engineers offers multiple funding and technical assistance programs available for flood hazard mitigation actions
U.S. Fire Administration	Wildfire Hazard	This agency provides leadership, advocacy, coordination, and support for fire agencies and organizations.
U.S. Fish and Wildlife Service	Wildfire Hazard	This service's fire management strategy employs prescribed fire throughout the National Wildlife Refuge System to maintain ecological communities.

Table 4-2. Summary of Relevant State Agencies, Programs and Regulations

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
Hawai'i Coastal Zone Management Program	Action Plan Implementation, Surf/Storm Surge/Coastal Flood Hazard	Mitigation actions need to conform to the goals and policies of this plan
Hawai'i Hazards Awareness and Resilience Program	Action Plan Implementation	Provides a resource for hazard education measures
Hawai'i State Plan	Action Plan Implementation	Mitigation actions need to conform to the goals and policies of this plan
Hawai'i State Grants-in-Aid Capital Improvement Projects Program	Action Plan Implementation	This program provides a potential source of funding for implementing mitigation actions
Ocean Resources Management Plan	Action Plan Implementation, Surf/Storm Surge/Coastal Flood Hazard	Mitigation actions need to conform to the goals and policies of this plan
State Building Code and Design Standards	Action Plan Implementation	Mitigation actions need to comply with all state building code requirements
State General Flood Control Plan	Action Plan Implementation, Flood Hazard	Mitigation actions need to conform to the goals and policies of this plan
State of Hawai'i Hazard Mitigation Plan	Mitigation Plan development	The state hazard mitigation plan provides information that is useful in developing local hazard mitigation plans
State of Hawai'i Land Use Law	Action Plan Implementation	Mitigation actions need to comply with all state land use requirements

4.2 LOCAL

4.2.1 Hazard Mitigation Planning and Plan Development

Hazard mitigation planning is the process that analyzes a community’s risk from natural hazards, evaluates existing measure and identifies gaps, and implements actions to further reduce risks. Since November 1, 2003, local governments seeking Pre-Disaster Mitigation (PDM) funds through a state application must have an approved local mitigation plan prior to the approval of local mitigation project grants. Since November 1, 2004, states must also have an approved standard State Mitigation Plan in order to receive PDM funds for state or local mitigation projects. The standard State Mitigation Plan also is required for non-emergency assistance, including Public Assistance restoration of damaged facilities and Hazard Mitigation Grant Program (HMGP) funding. Therefore, state and local multi-hazard mitigation plans are keys to maintaining eligibility for future FEMA mitigation and disaster recovery funding. County plans must be updated every five years to continuously maintain funding eligibility. Figure 4-1 shows the planning process.

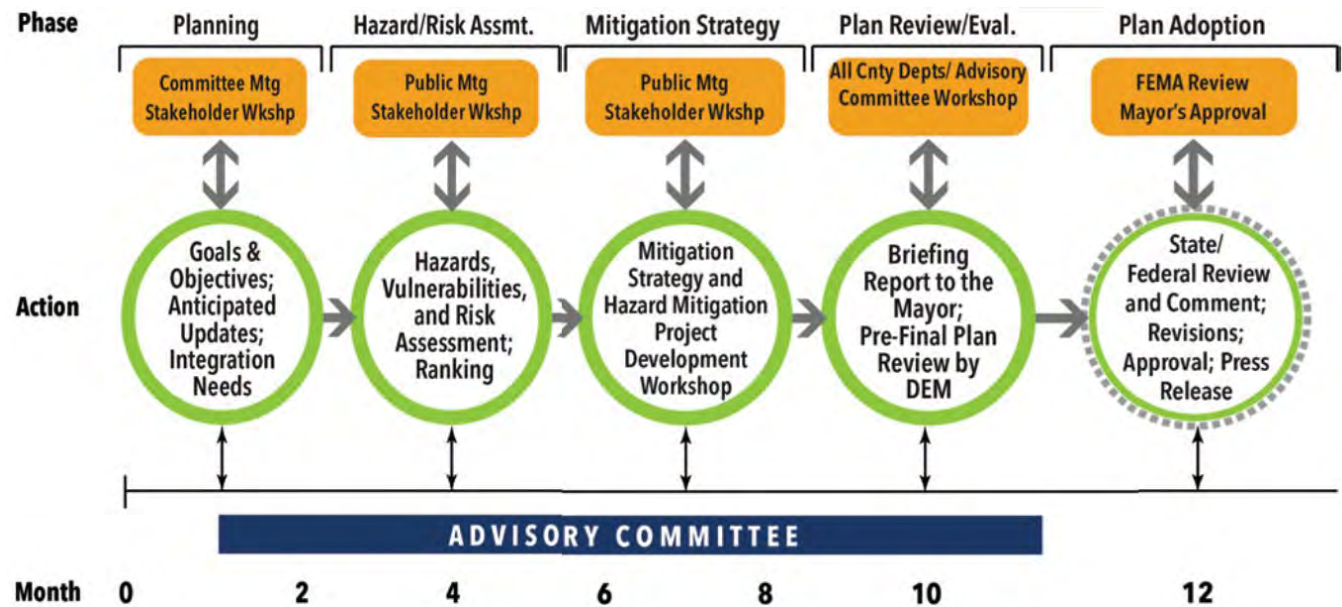


Figure 4-1. Hazard Mitigation Planning Process

Hazards are physical conditions or events that have the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of losses. The intent is to present the current state of knowledge of the following significant natural hazards within the City & County of Honolulu.

- Climate Change Effects
- Coastal Erosion
- Strong Winds (Non-tropical cyclonic)
- Tropical Cyclones (including Hurricanes)
- Floods
- Tsunamis

- Earthquakes
- Landslides and Rockfalls
- Droughts
- Wildfire
- Hazardous Materials
- Dam Failures

The hazard mitigation planning effort for the City & County of Honolulu involves the participation of the following agencies:

- Department of Emergency Management (DEM),
- The Mayor
- The City Council
- The City's Office of Climate Change, Sustainability and Resiliency
- The Honolulu Climate Change Commission
- Other City department representatives
- The plan's Advisory Committee
- Cross Island Communities Resilience Network
- Hawaii Emergency Management Agency
- The Hawaii Department of Land and Natural Resources
- The State Hazard Mitigation Forum
- Hawaiian Electric Company
- National Oceanic and Atmospheric Administration Central Pacific Hurricane Center.

4.2.2 Land Use Planning and Development in the City & County of Honolulu

The City guides and directs land use and growth through a three-tier system of objectives, policies, planning principles, guidelines, and regulations.

- The General Plan forms the first tier of this system, consisting primarily of statements of objectives and policies.
- The second tier of the system is formed by the Development Plans or Sustainable Communities Plans, depending whether growth is planned for the region. These plans address eight geographic regions of the island: the Primary Urban Center, Central Oahu, Ewa, Waianae, North Shore, Koolauloa, Koolaupoko, and East Honolulu (see Figure 4-2).
- The third tier of the system is composed of the implementing ordinances, including the Land Use Ordinance (Honolulu's zoning code) and the City's Capital Improvement Program. Mandated by the City Charter, these ordinances constitute the principal means for implementing the City's plans.



Figure 4-2. Geographic Regions of Honolulu

The tiers are supplemented with functional plans for the countywide water and wastewater systems and transportation. There is a high priority need to integrate natural hazard policies into the General Plan & Community Development Plans.

The major flooding events in Hawaii are caused by storms, storm surge, high surf and tsunamis. High waves from hurricanes most often hit the eastern shores as hurricanes approach the islands from the east, and south- and west-facing shorelines as the storm passes to the south and west. In the City, from about 1915, floods caused by rainstorms, including tsunamis and hurricanes, have claimed more than 140 lives and inflicted more than \$225 million dollars of direct and indirect damage. Some of the largest rainfall counts and most severe flooding events have occurred in the last several years, with the Kauai and East Oahu floods in April 2018 alone causing an estimated \$20 million in damage to public infrastructure on Oahu. The electrical code should incorporate special requirements to keep electrical equipment of essential and critical facilities protected from flooding. Homeowners in the flood zones will benefit from reduced insurance premiums when if the City participates in FEMA's Community Rating System (CRS).

4.2.3 Office of Climate Change, Sustainability and Resiliency

The City and County of Honolulu (City) Office of Climate Change, Sustainability and Resiliency (Resilience Office) is tasked with tracking climate change science and potential impacts on City facilities and communities, coordinating actions and policies of departments within the City to increase community preparedness, developing resilient infrastructure in response to the effects of climate change, and integrating sustainable and environmental values into City plans, programs, and policies. The Resilience Office was established by the voters of the City via a City Charter amendment in the 2016 election.

The Resilience Office has led and coordinated the City's efforts to produce the [Ola: O'ahu Resilience Strategy](#), [Climate Action Plan](#), currently underway climate adaptation strategy, [Climate Ready O'ahu](#), and the City's participation in the FEMA's National Flood Insurance Program (NFIP) Community Rating System (CRS). The Resilience Office also produces the City's [Annual Sustainability Report](#) to track progress on a variety of sustainability measures and indicators. Additionally, in coordination with the City's Department of Emergency Management, the Resilience Office assists in establishing and managing a pre-disaster hazard mitigation program including the production of the City's [Multi-Hazard Pre-Disaster Mitigation Plan](#)

100 Resilient Cities

The City of Honolulu was selected as an inaugural member of 100 Resilient Cities network pioneered by the Rockefeller Foundation, an organization that helps cities confront 21st century challenges. The network gives cities tools to develop a road map to resilience:

- Financial and logistical guidance for establishing an innovative new position in city government—a Chief Resilience Officer—to lead the city's resilience efforts
- Expert support for development of a robust resilience strategy
- Connection with service providers and others who can help implement resilience strategies
- Membership in a global network of member cities that share best practices and support pioneering resilience.

Through these actions, the 100 Resilient Cities network aims to build urban resilience and establish guidelines for resilience among governments, non-governmental organizations, the private sector, and individual residents.

5. MITIGATED REPETITIVE LOSS PROPERTIES

5.1 REPETITIVE LOSS LIST CORRECTION

CRS-participating communities are required to review their lists of repetitive-loss properties for accuracy, for correct addresses, to determine whether the properties are actually in the community's corporate limits, and to determine whether the insured buildings have been removed, retrofitted, or otherwise protected from the cause of the repetitive flooding. The result of this review is recorded on a Repetitive Loss Update Worksheet (AW-501; see Figure 5-1). A community with repetitive losses must sign the Repetitive Loss List Community Certification (CC-RL), certifying that each address has been checked. If there are updates, the submittal must include corrected Repetitive Loss Update Worksheets with any required supporting documentation. The community must note the following situations in which the form should be updated:

1. The property is not located in the community's jurisdiction. The property may be outside the community's corporate limits, it may be in another city, or it may have been annexed by another community. If it can be determined in which community the property belongs, the property will be reassigned to the correct community. If a property is not in the community, it will not be reassigned unless the community in which the property does belong can be definitely identified.
2. There was an error in the repetitive loss data base, such as a duplicate listing or an incorrect address.
3. The property has subsequently been protected from the types of events that caused the losses. Buildings that have been acquired, relocated, retrofitted, or otherwise protected from the types of frequent floods that caused the past damage are not counted in determining the community's CRS requirements.
4. The property is protected from damage by the base flood shown on the current Flood Insurance Rate Map (FIRM). For example, the community may demonstrate that the building is elevated or flood-proofed above the base flood elevation but was flooded by a higher level. If the property is outside the Special Flood Hazard Area, the community may show that all of the repetitive losses were caused by events with recurrence intervals of over 100 years.

For corrections made under situations 3 or 4 above, all future AW-501s issued for the community will be segregated into two categories: mitigated and unmitigated.

Federal Emergency Management Agency OMB #1660-0023 EXPIRES Sept 30, 2013
National Flood Insurance Program
NFIP REPETITIVE LOSS UPDATE WORKSHEET (AW-501)

THE INFORMATION ON THE FORM IS BASED ON CLAIMS ON OR BEFORE 01/31/2011

REPETITIVE LOSS NUMBER: 0987654

Internal Use Only	A	N/A	FRR
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NFIP Community Name: BALDWIN COUNTY* CID#: 015000

Local Property Identifier: 56-09-29-0-999-000

Current Property Address ----- 12345 MEMORY LANE FAIRHOPE AL 365325963	Previous Property Address/Community ID# -----
--	--

Last Claimant: _____

Insured: YES Named Insured: ELMER FLOOD

Dates of Losses: _____ Total Number of Losses for Property: 2

20040916	19980927						
----------	----------	--	--	--	--	--	--

REQUESTED UPDATES

MARK ALL UPDATES BELOW THAT APPLY (IMPORTANT - SEE INSTRUCTIONS)

1. **INFORMATION PROVIDED NOT SUFFICIENT TO IDENTIFY PROPERTY.**
Choose this update if all attempts to locate the property fail. Please describe the steps you took to locate the property in the comments section below.
2. **COSMETIC CHANGES REQUIRED TO THE ADDRESS:**
Update the address shown above and/or add your local alternative property identifier such as a Tax Assessor #.
3. **PROPERTY NOT IN OUR COMMUNITY OR JURISDICTION:**
Choose this update if you have positively determined that the property shown is not located in your community. Please provide the correct NFIP community name and if known the NFIP Community ID Number. If available, please attach a map showing the property location.
ASSIGN TO NFIP COMMUNITY NAME: _____ NFIP COMMUNITY ID #: _____
4. **FLOOD PROTECTION PROVIDED.**
Choose this update if some type of structural intervention has occurred to the building, property or the source of flooding that protects the building from future events similar to those that occurred in the past. The update must be supported by documentation such as an Elevation Certificate and the Mitigation action and funding information below must be provided.
Mitigation Action 1.) F Source of Primary Mitigation Funding 3.) Q Secondary Source of Funding 3.) W
5. **NO BUILDING ON PROPERTY.**
Choose this update only if the property in question can be positively identified as the site of the previously flooded building and documentation is available to support that an insurable building no longer exists at this site. The update must be supported by documentation such as a Demolition or Relocation Permit and the Mitigation action and funding information below must be provided.
Mitigation Action 2.) _____ Source of Primary Mitigation Funding 3.) _____ Secondary Source of Funding 3.) _____
See Appropriate Mitigation Action and Funding Codes
6. **DUPLICATE LISTING WITH RL NUMBER:** _____ **COMBINE AS ONE LISTING.**
Choose this update to identify two or more separate listings that are for the same building. List all other RL numbers that are duplicates to this property. Please indicate which address shown is the correct address to use.
7. **HISTORIC BUILDING:**
Choose this update if you know the building is or would be eligible to be listed on a State or National Historic Registry.

COMMENTS SECTION: _____

A signed RL Transmittal Sheet must accompany this form for approval of the update!

03/31/2011 PAGE 73 OF 448

Figure 5-1. Example AW-501

5.2 MITIGATED REPETITIVE LOSS PROPERTIES

The City & County of Honolulu provided AW-501 correction worksheets for the following RL properties:

2380	14693	46738	53340	59583
9348	31471	49591	59552	59584
12815	41693	49917	59553	83272
14314	44686	50581	59574	127302

These properties were subsequently removed from FEMA's list of repetitive loss properties for the following reasons (see below example):

- Property not in Honolulu
- Loss caused by 100-year or greater storm
- Pre-firm structure demolished, vacant lot
- Pre-firm structure demolished; post-firm structure built to current elevation
- Listed with PO Box, unable to determine location
- Duplicate listing

6. MITIGATION ALTERNATIVES CONSIDERED

Although this report presents separate analyses for each identified repetitive loss area in the City & County of Honolulu, the list of potential mitigation measures to address repetitive flooding problems was the same for each area. This chapter summarizes the alternatives that were identified for consideration. These mitigation measures can be implemented by the City, the homeowner, or other entities. The selection of suitable measures for each at-risk property in the repetitive loss areas is described in the chapters presenting individual repetitive loss area analyses.

Many types of flood hazard mitigation exist, and there is not one mitigation measure that fits every case or even most cases. Successful mitigation often requires multiple strategies. The CRS Coordinator's Manual (FEMA 2017) breaks the primary types of mitigation down as follows:

- **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 usually administered by building, zoning, planning, and/or code enforcement offices.
- **Property protection** activities are usually undertaken by property owners on a building-by- building or parcel basis.
- **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
- **Emergency services** are measures taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
- **Structural projects** keep floodwaters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
- **Public information** activities advise property owners, potential property owners, and visitors about hazards and ways to protect people and property from them, as well as the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.

6.1 PREVENTIVE

The City & County of Honolulu regulates residential and commercial development through its building code, planning and zoning requirements, stormwater management regulations and floodplain management ordinances. Any project located in a floodplain, regardless of its size, requires a permit from the City/County, unless the project can be characterized as routine maintenance.

6.2 PROPERTY PROTECTION

Property protection measures are generally performed by property owners or their agents. FEMA has published numerous manuals to help property owners determine appropriate property protection measures:

- FEMA 259, Engineering Principles and Practices of Retrofitting Floodprone Residential Structures
- FEMA 312, Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding
- FEMA 551, Selecting Appropriate Mitigation Measures for Floodprone Structures
- FEMA 348, Protecting Building Utilities from Flood Damage
- FEMA 511, Reducing Damage from Localized Flooding
- FEMA 102, Floodproofing Non-Residential Structures
- FEMA 84, Answers to Questions about the NFIP
- FEMA 54, Elevated Residential Structures Book
- FEMA 268, Protecting Floodplain Resources: A Guidebook for Communities
- FEMA 347, Above the Flood: Elevating Your Floodprone House
- FEMA 85, Protecting Manufactured Homes from Floods and Other Hazards

The manuals listed above are available for review at FEMA's website. For a complete guide to retrofitting homes for flood protection, see FEMA P-312, *Homeowner's Guide to Retrofitting 3rd Edition* (FEMA 2014). The primary methods of property protection in the City are:

- Demolition/relocation.
- Elevation (structure or damage prone components such as furnace or AC unit)
- Dry flood-proof (so water cannot get in).
- Direct drainage away from the building.
- Drainage maintenance.
- Sewer Improvements.

6.2.1 Acquisition

One of the most effective approaches to preventing further flood damage to a building is acquisition and relocation or clearing of the structure. The property would then serve as open space or recreation area. Property owners retain the right to select this as a mitigation method. They may sell their property to a government agency or an agency dedicated to the preservation and management of local open space. The property owner can also relocate the building to another property. Alternatively, the building can be moved to another area of the same property, if that area is outside the flood hazard. The property owner can also take advantage of federal funding for such mitigation.

For the City & County of Honolulu's RLAA, it has been determined that acquisition would not be a cost-effective alternative for structures with probable flood depths of 2 feet or less. "Cost-effective" means that the benefits of the action would equal or exceed the costs to implement the action. For this RLAA, a benefit is considered to be

an avoided loss. The high value of property in the City & County of Honolulu makes it unlikely that acquisition projects can be cost-effective.

6.2.2 Home Elevation

Sometimes dry or wet flood-proofing are not enough and greater measures must be taken. For example, if the floodwaters are too high for dry flood-proofing and the inhabited area is too low for wet flood-proofing, it may be necessary to raise the structure. Whenever the floor of a home is below the 100-year flood elevation, physically elevating the structure is often recommended as it is one of the most effective means to prevent flood damage. Financial assistance may be available for floodproofing. The City requires all substantially improved residential buildings to have their lowest floor elevated 1 foot above the 100-year elevation.

6.2.3 Dry Flood-Proofing

Dry flood-proofing consists of completely sealing around the exterior of the building so that water cannot enter the building. Dry flood-proofing is not a good option for areas where floodwater is deep or flows quickly. The hydrostatic pressure and/or hydrodynamic force can structurally damage the building by causing the walls to collapse or causing the entire structure to float. However, in areas that have minimal velocity and low depth, dry flood-proofing can be a good option.

Many flood hazards can be mitigated with various forms of dry flood-proofing. Properties that do not have adequate protection of their low opening (window or basement door) can effectively raise the low opening height with a window well or a flood gate. The ultimate height of the low opening depends on several factors, such as: the level of flood protection desired, the appearance, and cost. The flood protection elevation could be set 1-foot higher than the existing low opening elevation, or it could be set to match the elevation of the lowest opening into a home that cannot be raised. This might be the elevation of the threshold of a door, for example.

The NFIP only allows dry flood-proofing for residential retrofits that are not classified as a substantial improvement. A substantial improvement is any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the “start of construction” of the improvement.

6.2.4 Wet Flood-Proofing

Wet flood-proofing consists of modifying uninhabited portions of a home, such as a crawlspace, garage, or unfinished basement with flood-damage resistant materials, to allow floodwaters to enter the structure without causing damage (see Figure 6-1). Wet flood-proofing requires portions of the building to be cleared of valuable items and mechanical utilities. A key component of wet flood-proofing is providing openings large enough for the water to flow through the structure such that the elevation of the water in the structure is equal to the elevation of the water outside of the structure. This equilibrium of floodwater prevents hydrostatic pressure from damaging structural walls.

Source: FEMA P-312, June 30, 2014

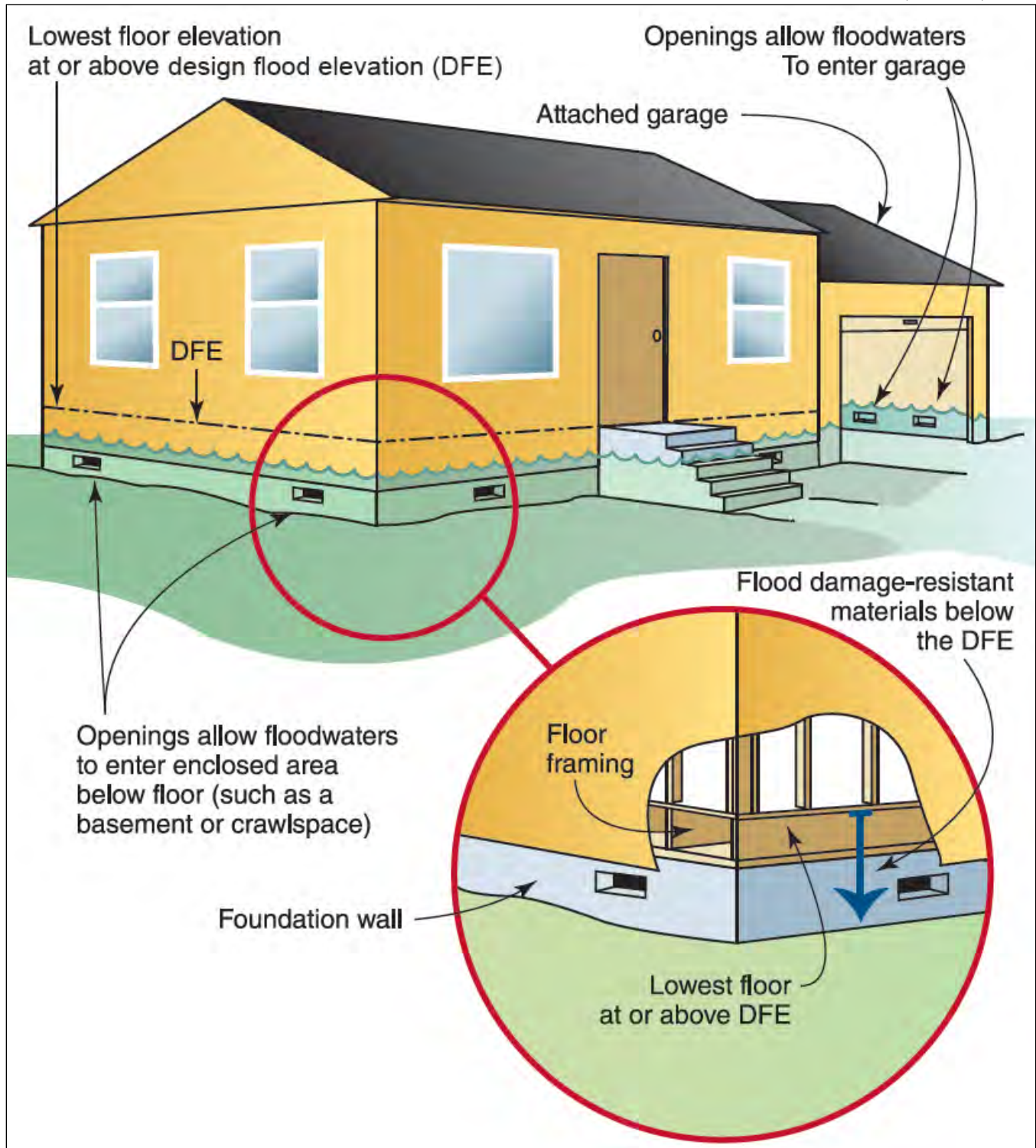


Figure 6-1. Wet Flood-Proofing Example

6.2.5 Direct Drainage Away from the Building

In some cases, there are activities that the property owner can do on-site such as directing shallow floodwater away from a flood-prone structure. Shallow flooding can often be kept away from a structure if some simple improvements are made to the yard. Sometimes structures are built at the bottom of a hill or in a natural drainage way or storage area, so that water naturally flows toward them.

One solution is to regrade the yard. If water flows toward the building; a new swale or wall can direct the flow to the street or a drainage way. Filling and grading next to the building can also direct shallow flooding away. Although water may remain in the yard temporarily, it is kept away from the structure. When these types of drainage modifications are made, care must be taken not to adversely affect the drainage patterns of adjacent properties. Over time, the swales along the lot lines or in the back yard may get filled in. Property owners build fences, garages, sheds, swimming pools, and other obstructions up to the lot line. These drainage problems can be fixed by removing the obstructions and restoring the swales so they will carry water away from the building.

6.2.6 Drainage Maintenance

Dumping into the drainage system is a violation under the City & County of Honolulu's Chapter 21 Code. Debris can accumulate and restrict the flow of stormwater, increasing the potential of localized flooding.

Heavy rains can saturate the soil and infiltrate the sanitary sewer system through leaky joints or cracks in the pipes. The inflow of stormwater floods the sanitary sewer system causing water to back-up into the home through lower level plumbing fixtures. This occurrence can be prevented by installing a sewer backflow preventer. A backflow preventer will allow the sanitary sewer water to flow freely from the home to the sewer, but restrict the reverse flow. Backflow preventers do require maintenance and can fail if debris in the sewer prevents the valve seating properly. An overhead sewer system pumps wastewater from basement level plumbing fixtures up to an elevation near the ground level, where it can drain by gravity into the sewer service line. This higher sewer makes it unlikely that water will back-up into the building.

6.2.7 Temporary Barriers

Several types of temporary barriers are available to address typical flooding problems. They work to direct drainage away from structures with the same principles as permanent barriers such as floodwalls or levees, but can be removed, stored, and reused in subsequent flood events.

6.3 NATURAL RESOURCE PROTECTION

Care should be taken to maintain the streams, wetlands and other natural resources within a floodplain or repetitive loss area. Removing debris from streams and channels prevents obstructions. Preserving and restoring natural areas provides flood protection, preserves water quality and provides natural habitat.

6.4 EMERGENCY SERVICES

Advance identification of an impending storm is only the first part of an effective Flood Warning and Response Plan. To truly realize the benefit of an early flood warning system, the warning must be disseminated quickly to floodplain occupants, repetitive loss areas and critical facilities. Appropriate response activities must then be implemented, such as: road closures, directing evacuations, sandbagging, and moving building contents above

flood levels. Finally, a community should take measures to protect public health and safety and facilitate recovery. These measures may include: cleaning up debris and garbage, clearing streets, and ensuring that that citizens have shelter, food, and safe drinking water.

6.5 STRUCTURAL PROJECTS

Structural projects keep floodwaters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by appropriate staff. The City & County of Honolulu Department of Public Works develops and implements capital projects.

6.6 PUBLIC INFORMATION

One of the most important, and often overlooked, aspects of mitigation is public awareness. Awareness starts with recognition of the flood risk. FIRM panels, which designate areas of a community according to various levels of flood risk, can be viewed at www.FEMA.gov. Also, real estate transactions require disclosure of known flood hazards. The next level of awareness is related to flood hazard mitigation measures. Often homeowners can greatly reduce their risks with mitigation efforts if they are aware of the risks.. For that reason, as part of this analysis, every resident in the repetitive loss area has been contacted and informed of the opportunity to review this Report. In addition, the City & County of Honolulu Resilience Office sends an annual outreach letter to every resident in each repetitive loss area.

6.7 MITIGATION MEASURE GROUPINGS

Grouping RL areas by appropriate mitigation alternatives provides a better understanding of current and future repetitive loss claims, options for outreach, and grant opportunities for residents. Based on the analysis performed for this report, two mitigation groupings were identified:

- Properties suitable for mitigation that includes drainage maintenance and/or elevation (see Chapter 7)
- Properties suitable for mitigation that includes floodproofing (see Chapter 8)

An outreach letter explaining the analysis of each repetitive loss area and requesting feedback on experiences opened the dialogue as to the cause of flooding. All structure owners are aware of the possibility for future flooding along with various options for mitigation.

City and County of Honolulu 2021 Repetitive Loss Area Analysis

PART 2—ANALYSIS OF INDIVIDUAL REPETITIVE LOSS AREAS

7. DRAINAGE MAINTENANCE AND/OR ELEVATION

This chapter presents the repetitive loss areas where drainage maintenance and/or elevation is suggested. In each of these repetitive loss areas, property damage was determined to have been caused from flooding due to poor drainage. Mitigation for these properties includes improved drainage maintenance to address increased run-off from new development or lack of capacity from underground storm sewer. Most structures would also benefit from elevation to recent FEMA mapping requirements or to levels determined by increased flood heights caused by recent development. Some of the properties in these areas are not in the FEMA-identified special flood hazard area and may not have flood insurance.

Each section of this chapter describes one repetitive loss area, including a list of repetitive loss properties (referenced by the FEMA RL identifier), a description of additional properties in the area (if any were identified), and a map of the repetitive loss area. Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.1 REPETITIVE LOSS AREA NO. 1

7.1.1 FEMA-Identified Repetitive Loss Properties

Table 7-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 7-1. Repetitive Loss Properties in Repetitive Loss Area 1

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
31478	<i>Addresses omitted from public version of document</i>	1/80, 11/78	\$10,427.50

7.1.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-2. Additional Properties Included in Repetitive Loss Area 1

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
1-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
1-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
1-3 – 1-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
1-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
1-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
1-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
1-11	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
1-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
1-13	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
1-14	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
1-15	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation

7.1.3 Map of Repetitive Loss Area



7.2 REPETITIVE LOSS AREA NO. 2

7.2.1 FEMA-Identified Repetitive Loss Properties

Table 7-3 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-3. Repetitive Loss Properties in Repetitive Loss Area 2

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
12813	<i>Addresses omitted from public version of document</i>	9/92, 03/91, 1/88	\$27,973.46

7.2.2 Additional Properties Included in Repetitive Loss Area

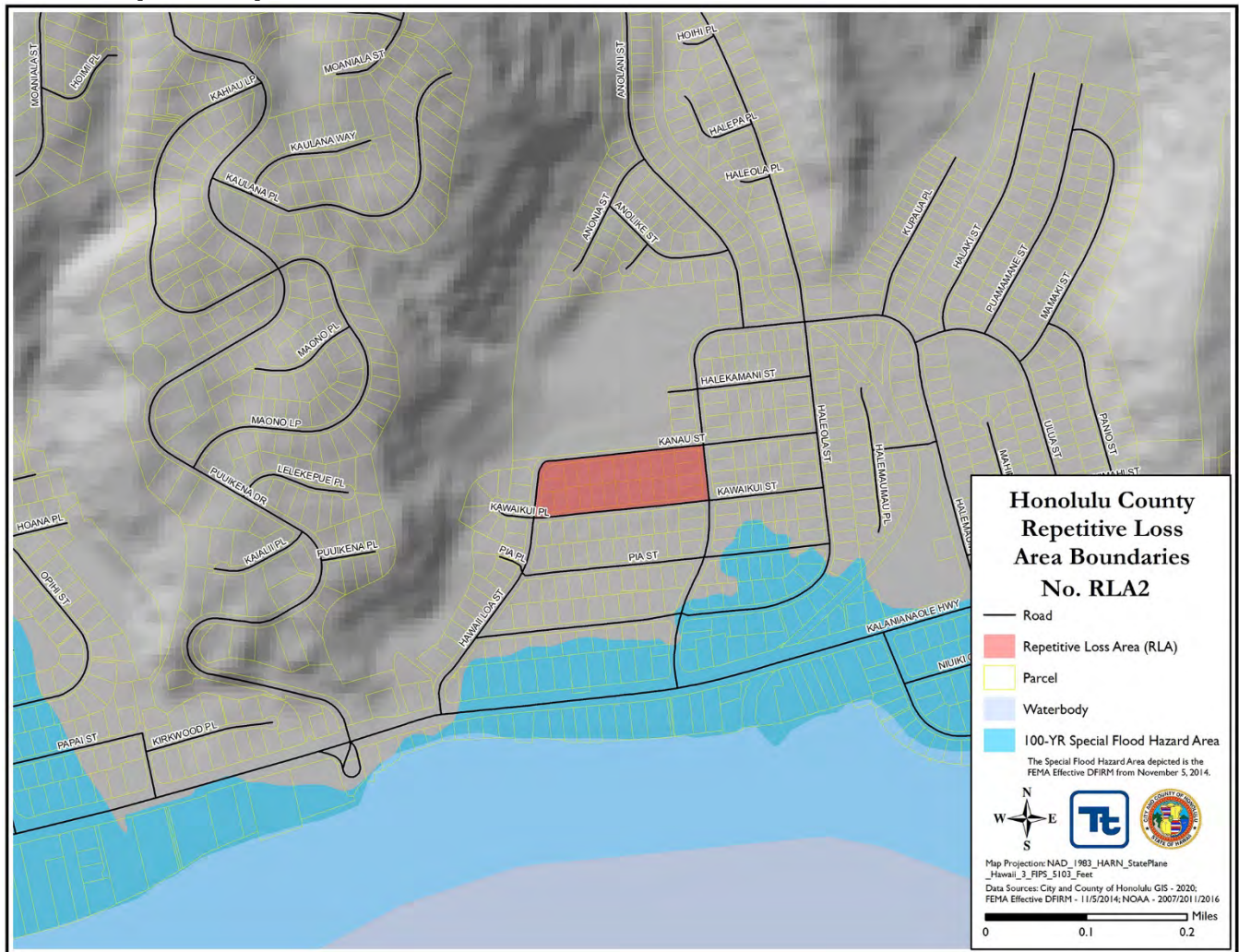
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-4 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-4. Additional Properties Included in Repetitive Loss Area 2

Property ID	Address	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
2-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
2-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
2-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
2-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
2-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
2-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
2-7	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
2-8	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
2-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
2-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation

Property ID	Address	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
2-11	Addresses omitted from public version of document	1	Crawlspace	Good	Drainage maintenance and Elevation
2-12	Addresses omitted from public version of document	1	Slab	Good	Drainage maintenance and Elevation
2-13	Addresses omitted from public version of document	1	Slab	Good	Drainage maintenance and Elevation
2-13	Addresses omitted from public version of document	1	Slab	Good	Drainage maintenance and Elevation

7.2.3 Map of Repetitive Loss Area



7.3 REPETITIVE LOSS AREA NO. 3

7.3.1 FEMA-Identified Repetitive Loss Properties

Table 7-5 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-5. Repetitive Loss Properties in Repetitive Loss Area 3

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
44110	<i>Addresses omitted from public version of document</i>	12/87, 01/80	\$28,019.29

7.3.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-6 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-6. Additional Properties Included in Repetitive Loss Area 3

Property ID	Address	Number of Insurable Buildings	Building Description		
			Foundation	Condition	
3-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation

7.3.3 Map of Repetitive Loss Area



7.4 REPETITIVE LOSS AREA NO. 4

7.4.1 FEMA-Identified Repetitive Loss Properties

Table 7-7 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-7. Repetitive Loss Properties in Repetitive Loss Area 4

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
275897	<i>Addresses omitted from public version of document</i>	02/18, 12/17	\$18,329

7.4.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.4.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.5 REPETITIVE LOSS AREA NO. 5

7.5.1 FEMA-Identified Repetitive Loss Properties

Table 7-8 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-8. Repetitive Loss Properties in Repetitive Loss Area 5

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
275397	<i>Addresses omitted from public version of document</i>	02/81, 6/11	\$143,310

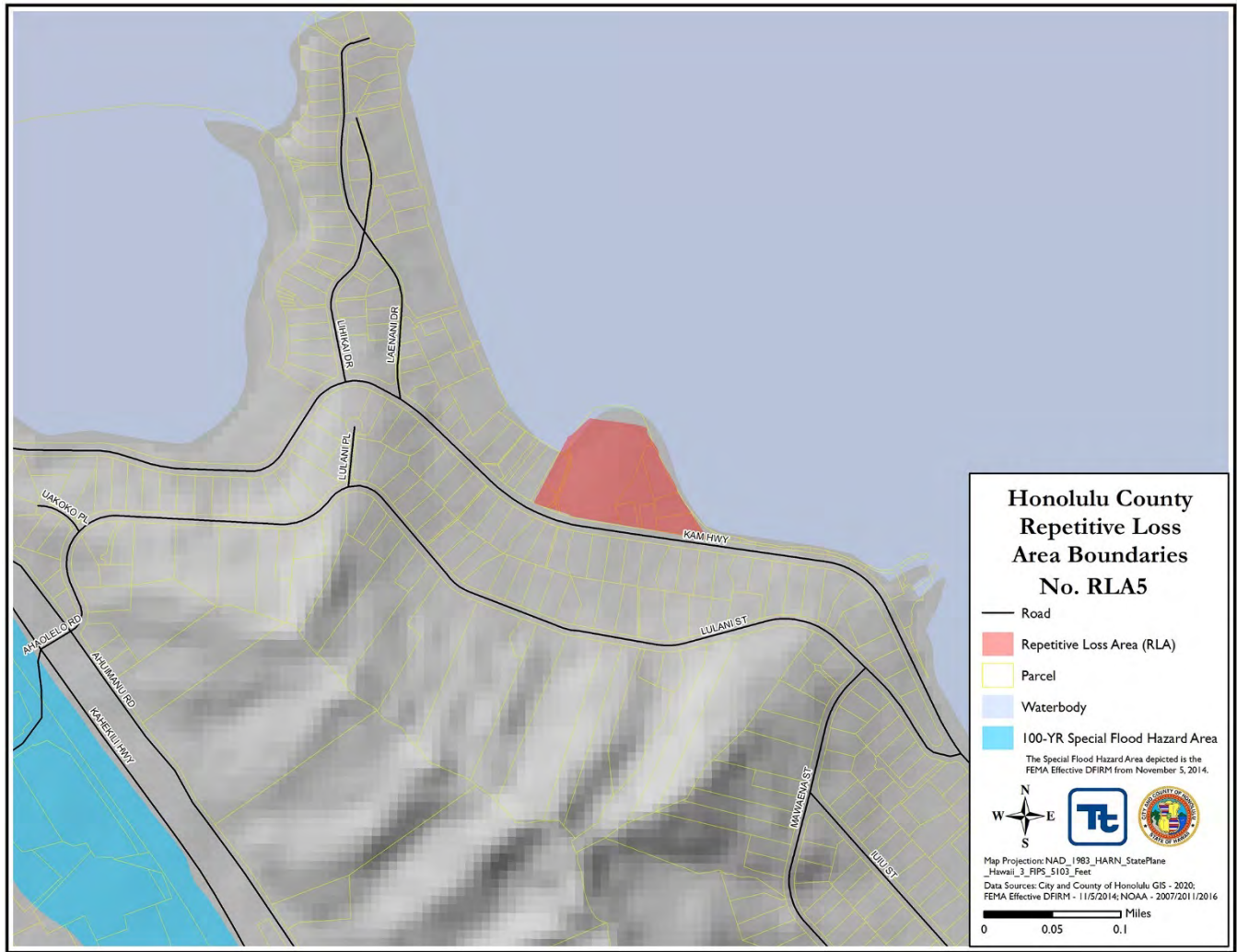
7.5.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-9 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-9. Additional Properties Included in Repetitive Loss Area 5

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
5-1	<i>Addresses omitted from public version of document</i>	1		Crawlspace	Drainage maintenance and Elevation

7.5.3 Map of Repetitive Loss Area



7.6 REPETITIVE LOSS AREA NO. 6

7.6.1 FEMA-Identified Repetitive Loss Properties

Table 7-10 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-10. Repetitive Loss Properties in Repetitive Loss Area 6

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59540	<i>Addresses omitted from public version of document</i>	04/18, 12/87, 1/80	\$76,330.83

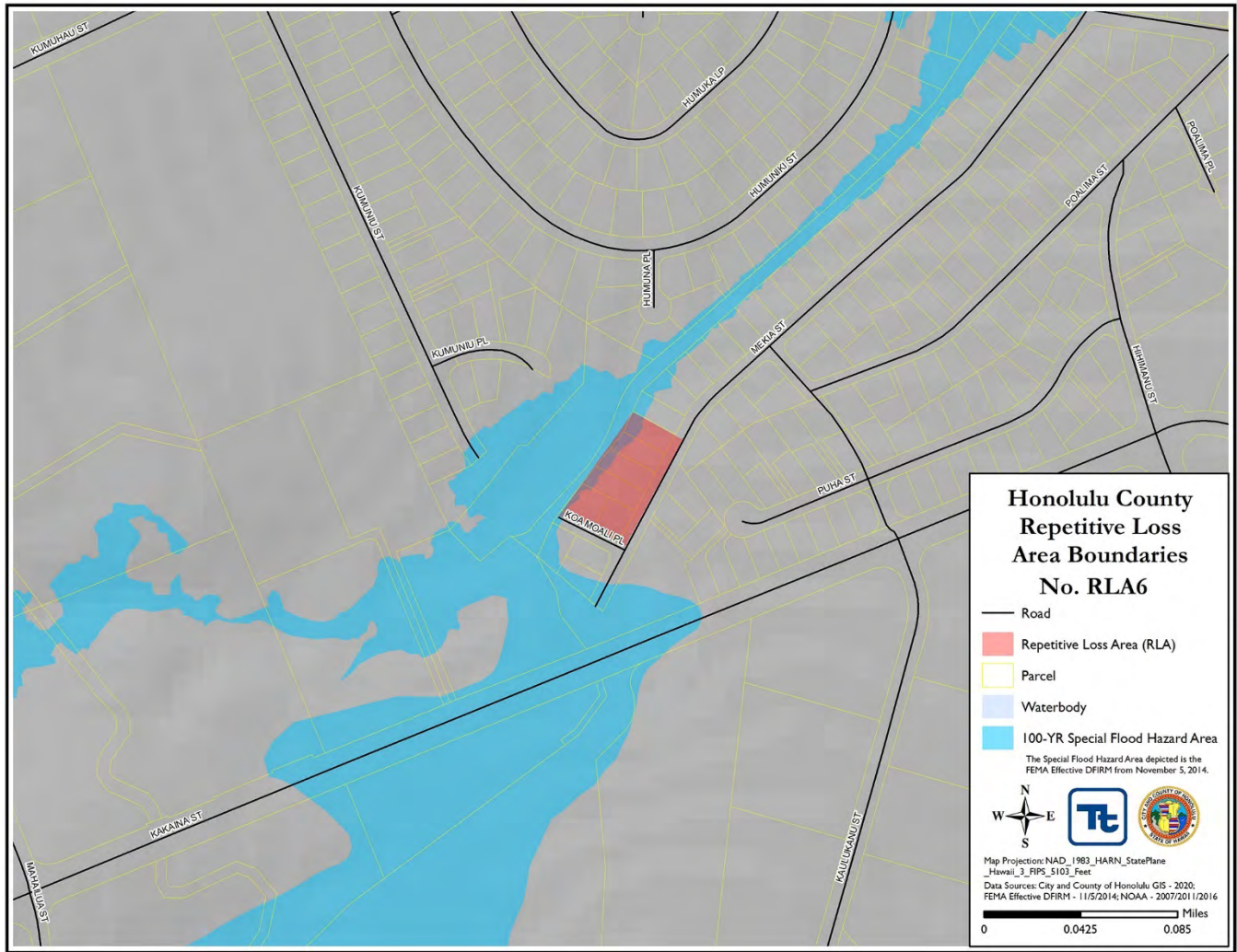
7.6.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-11 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them

Table 7-11. Additional Properties Included in Repetitive Loss Area 6

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
6-1	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
6-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
6-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
6-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
6-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation

7.6.3 Map of Repetitive Loss Area



7.7 REPETITIVE LOSS AREA NO. 7

7.7.1 FEMA-Identified Repetitive Loss Properties

Table 7-12 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-12. Repetitive Loss Properties in Repetitive Loss Area 7

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
184820	<i>Addresses omitted from public version of document</i>	12/06, 3/06	\$39,195.22

7.7.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.7.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.8 REPETITIVE LOSS AREA NO. 8

7.8.1 FEMA-Identified Repetitive Loss Properties

Table 7-13 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-13. Repetitive Loss Properties in Repetitive Loss Area 8

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
281464	<i>Addresses omitted from public version of document</i>	11/18, 2/18	\$57,815.88

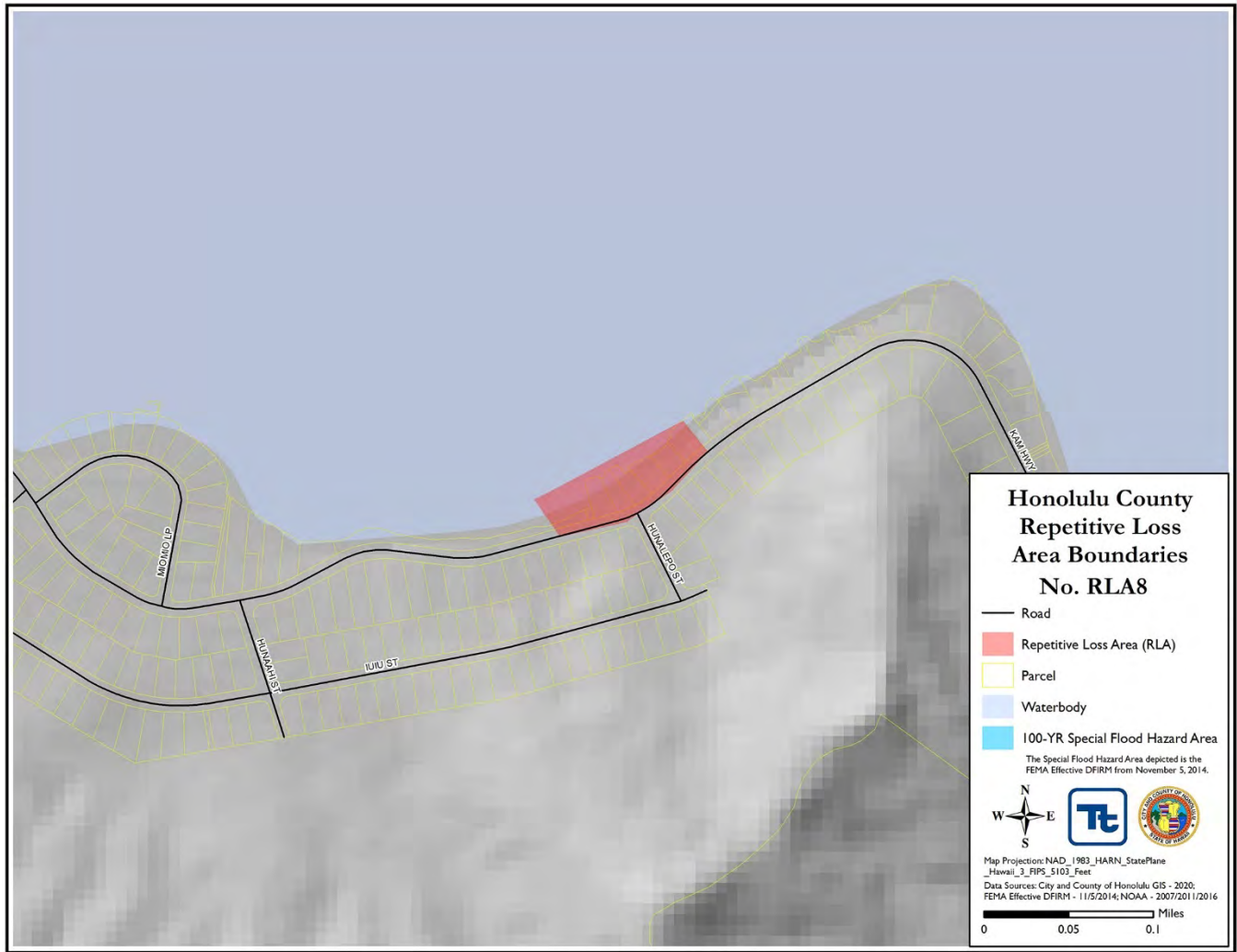
7.8.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-14 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them

Table 7-14. Additional Properties Included in Repetitive Loss Area 8

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
6-1	<i>Addresses omitted from public version of document</i>	1	Slab	Poor	Drainage maintenance and Elevation

7.8.3 Map of Repetitive Loss Area



7.9 REPETITIVE LOSS AREA NO. 9

7.9.1 FEMA-Identified Repetitive Loss Properties

Table 7-15 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-15. Repetitive Loss Properties in Repetitive Loss Area 9

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
47600	<i>Addresses omitted from public version of document</i>	2/85, 12/80	\$4,647.23

7.9.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.9.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.10 REPETITIVE LOSS AREA NO. 11

7.10.1 FEMA-Identified Repetitive Loss Properties

Table 7-16 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

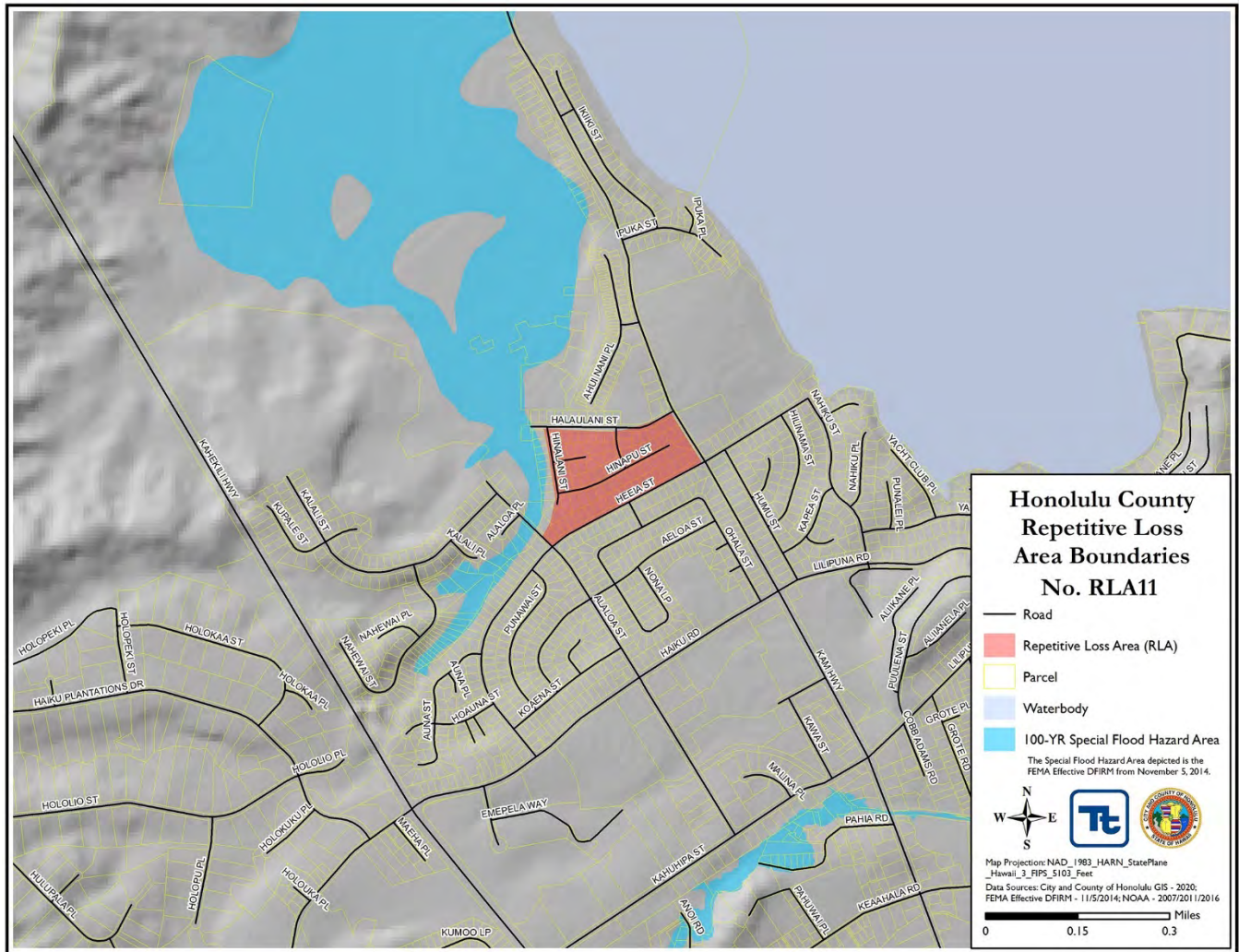
Table 7-16. Repetitive Loss Properties in Repetitive Loss Area 11

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
199518	Addresses omitted from public version of document	3/12, 6/11, 10/09	\$22,400.53
275891	Addresses omitted from public version of document	2/18, 7/16	\$9,290.81

7.10.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.10.3 Map of Repetitive Loss Area



7.11 REPETITIVE LOSS AREA NO. 12

7.11.1 FEMA-Identified Repetitive Loss Properties

Table 7-17 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-17. Repetitive Loss Properties in Repetitive Loss Area 12

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
240401	<i>Addresses omitted from public version of document</i>	7/14, 12/08	\$164,949.80

7.11.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-18 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them

Table 7-18. Additional Properties Included in Repetitive Loss Area 12

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
12-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage maintenance and Elevation
12-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
12-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
12-3	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
12-4	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
12-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation
12-6	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage maintenance and Elevation

7.11.3 Map of Repetitive Loss Area



7.12 REPETITIVE LOSS AREA NO. 13

7.12.1 FEMA-Identified Repetitive Loss Properties

Table 7-19 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-19. Repetitive Loss Properties in Repetitive Loss Area 13

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
276345	<i>Addresses omitted from public version of document</i>	10/17, 2/17	\$193,391.77

7.12.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-20 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them

Table 7-20. Additional Properties Included in Repetitive Loss Area 13

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
13-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
13-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
13-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
13-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
13-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.12.3 Map of Repetitive Loss Area



7.13 REPETITIVE LOSS AREA NO. 14

7.13.1 FEMA-Identified Repetitive Loss Properties

Table 7-21 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-21. Repetitive Loss Properties in Repetitive Loss Area 14

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59542	<i>Addresses omitted from public version of document</i>	4/89, 1/82	\$38,638.60

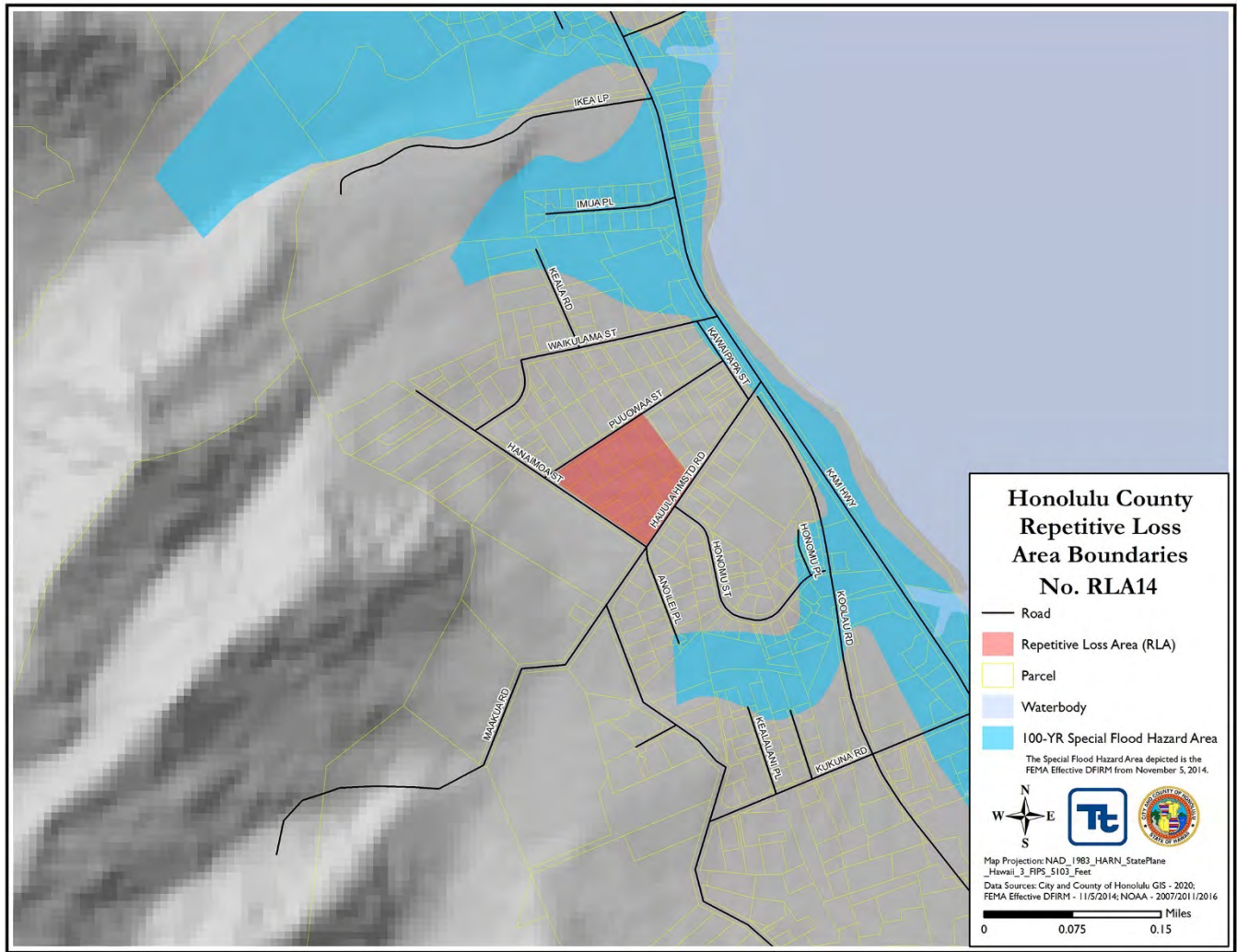
7.13.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-22 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-22. Additional Properties Included in Repetitive Loss Area 14

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
14-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
14-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
14-3	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
14-4	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
14-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
14-6	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
14-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
14-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
14-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
14-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.13.3 Map of Repetitive Loss Area



7.14 REPETITIVE LOSS AREA NO. 15

7.14.1 FEMA-Identified Repetitive Loss Properties

Table 7-23 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-23. Repetitive Loss Properties in Repetitive Loss Area 15

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
212817	<i>Addresses omitted from public version of document</i>	3/12, 3/06	\$1238,656.88

7.14.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-24 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-24. Additional Properties Included in Repetitive Loss Area 15

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
15-1	<i>Addresses omitted from public version of document</i>	1	Slab	Fair	Elevation and Drainage Maintenance
15-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
15-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
15-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
15-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
15-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance

7.14.3 Map of Repetitive Loss Area



7.15 REPETITIVE LOSS AREA NO. 18

7.15.1 FEMA-Identified Repetitive Loss Properties

Table 7-25 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-25. Repetitive Loss Properties in Repetitive Loss Area 18

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
183997	<i>Addresses omitted from public version of document</i>	12/08, 3/06	\$32,599.01

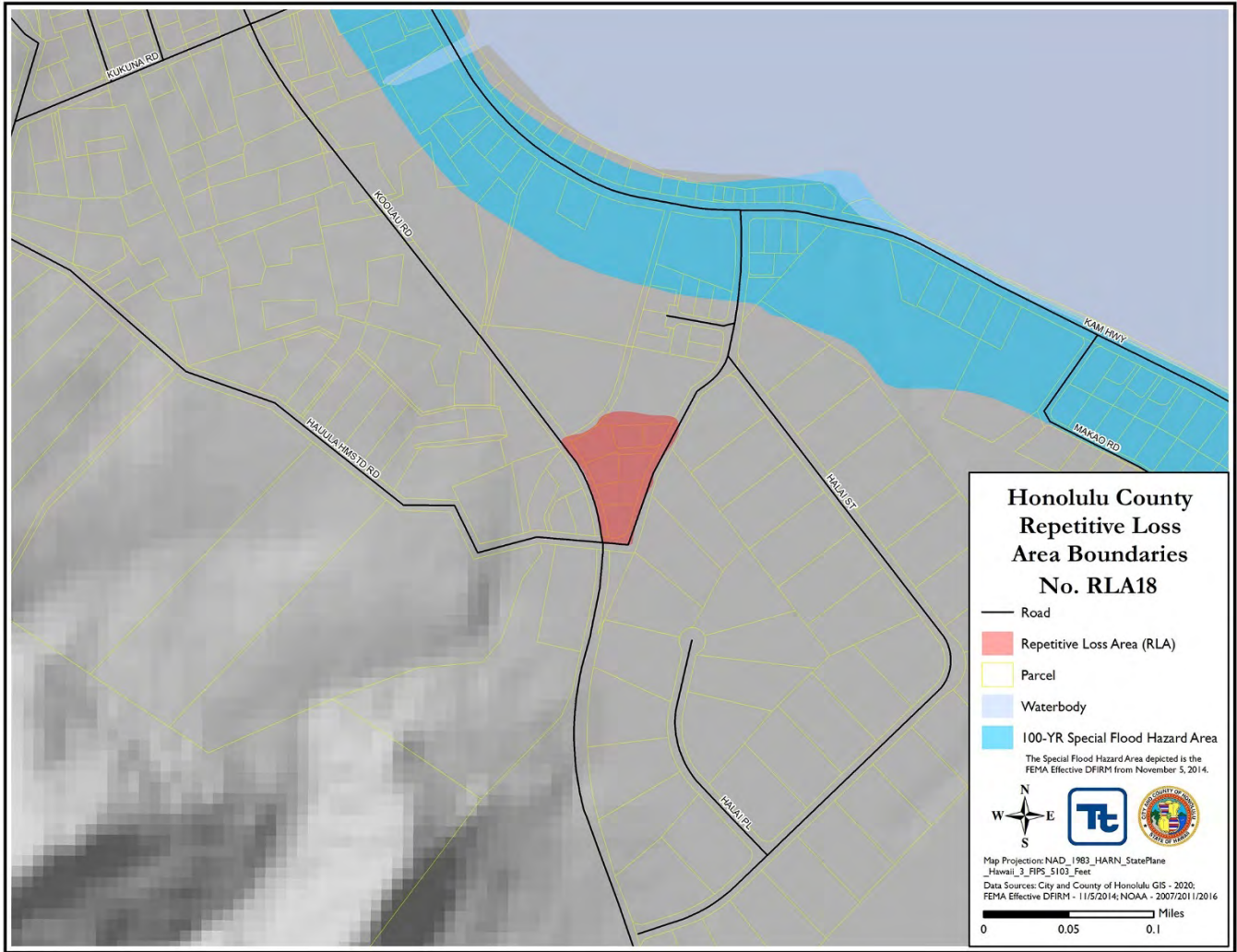
7.15.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-26 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-26. Additional Properties Included in Repetitive Loss Area 18

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
18-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
18-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
18-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
18-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance
18-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation and Drainage Maintenance

7.15.3 Map of Repetitive Loss Area



7.16 REPETITIVE LOSS AREA NO. 20

7.16.1 FEMA-Identified Repetitive Loss Properties

Table 7-27 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-27. Repetitive Loss Properties in Repetitive Loss Area 20

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
212478	<i>Addresses omitted from public version of document</i>	7/14, 3/12, 12/08	\$51,659.80

7.16.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.16.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.17 REPETITIVE LOSS AREA NO. 21

7.17.1 FEMA-Identified Repetitive Loss Properties

Table 7-28 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-28. Repetitive Loss Properties in Repetitive Loss Area 21

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
165060	<i>Addresses omitted from public version of document</i>	4/06, 2/04	\$9,202.26
164023	<i>Addresses omitted from public version of document</i>	3/06, 2/04	\$6,603.46
54984	<i>Addresses omitted from public version of document</i>	1/93, 2/85	\$23,469.91

7.17.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-29 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them

Table 7-29. Additional Properties Included in Repetitive Loss Area 21

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
21-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
21-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
21-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
13-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.18 REPETITIVE LOSS AREA NO. 22

7.18.1 FEMA-Identified Repetitive Loss Properties

Table 7-30 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-30. Repetitive Loss Properties in Repetitive Loss Area 22

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
127692	<i>Addresses omitted from public version of document</i>	3/04, 11/96	\$23,787.54

7.18.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.18.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.19 REPETITIVE LOSS AREA NO. 23

7.19.1 FEMA-Identified Repetitive Loss Properties

Table 7-31 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-31. Repetitive Loss Properties in Repetitive Loss Area 23

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
31483	<i>Addresses omitted from public version of document</i>	12/83, 1/80,	\$4,916.94

7.19.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.19.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.20 REPETITIVE LOSS AREA NO. 24

7.20.1 FEMA-Identified Repetitive Loss Properties

Table 7-32 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-32. Repetitive Loss Properties in Repetitive Loss Area 24

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
240356, 239858, 240623, 240113	<i>Addresses omitted from public version of document</i>	7/14, 3/20, 4/89, 3/06, 4/06, 7/14	\$113,558.78

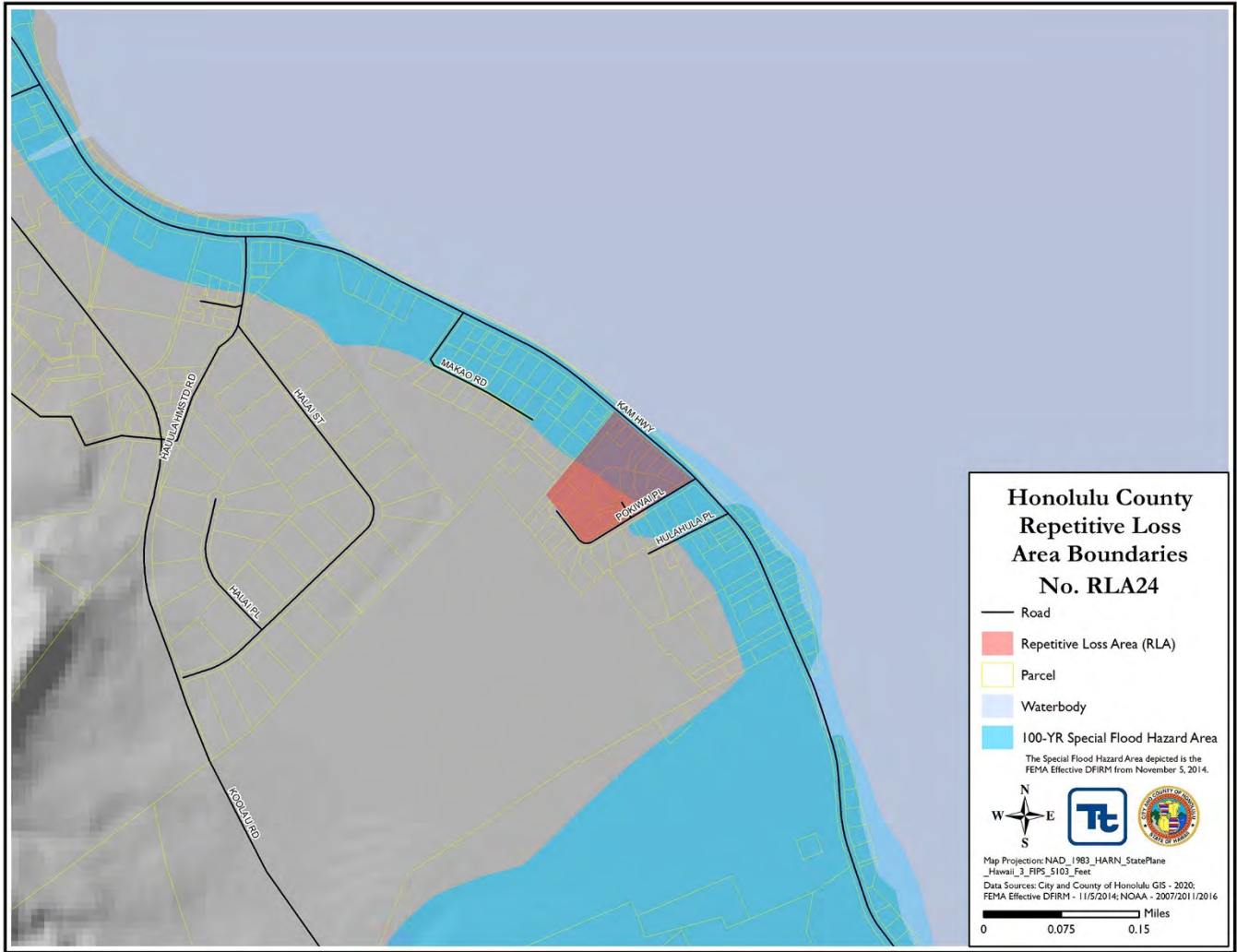
7.20.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-33 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-33. Additional Properties Included in Repetitive Loss Area 24

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
24-1	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.20.3 Map of Repetitive Loss Area



7.21 REPETITIVE LOSS AREA NO. 28

7.21.1 FEMA-Identified Repetitive Loss Properties

Table 7-34 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-34. Repetitive Loss Properties in Repetitive Loss Area 28

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
31484, 212925	<i>Addresses omitted from public version of document</i>	2/85, 3/12, 5/78, 12/10, 1/80	\$10,204.37

7.21.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-35 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-35. Additional Properties Included in Repetitive Loss Area 28

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
28-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
28-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.22 REPETITIVE LOSS AREA NO. 30

7.22.1 FEMA-Identified Repetitive Loss Properties

Table 7-36 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

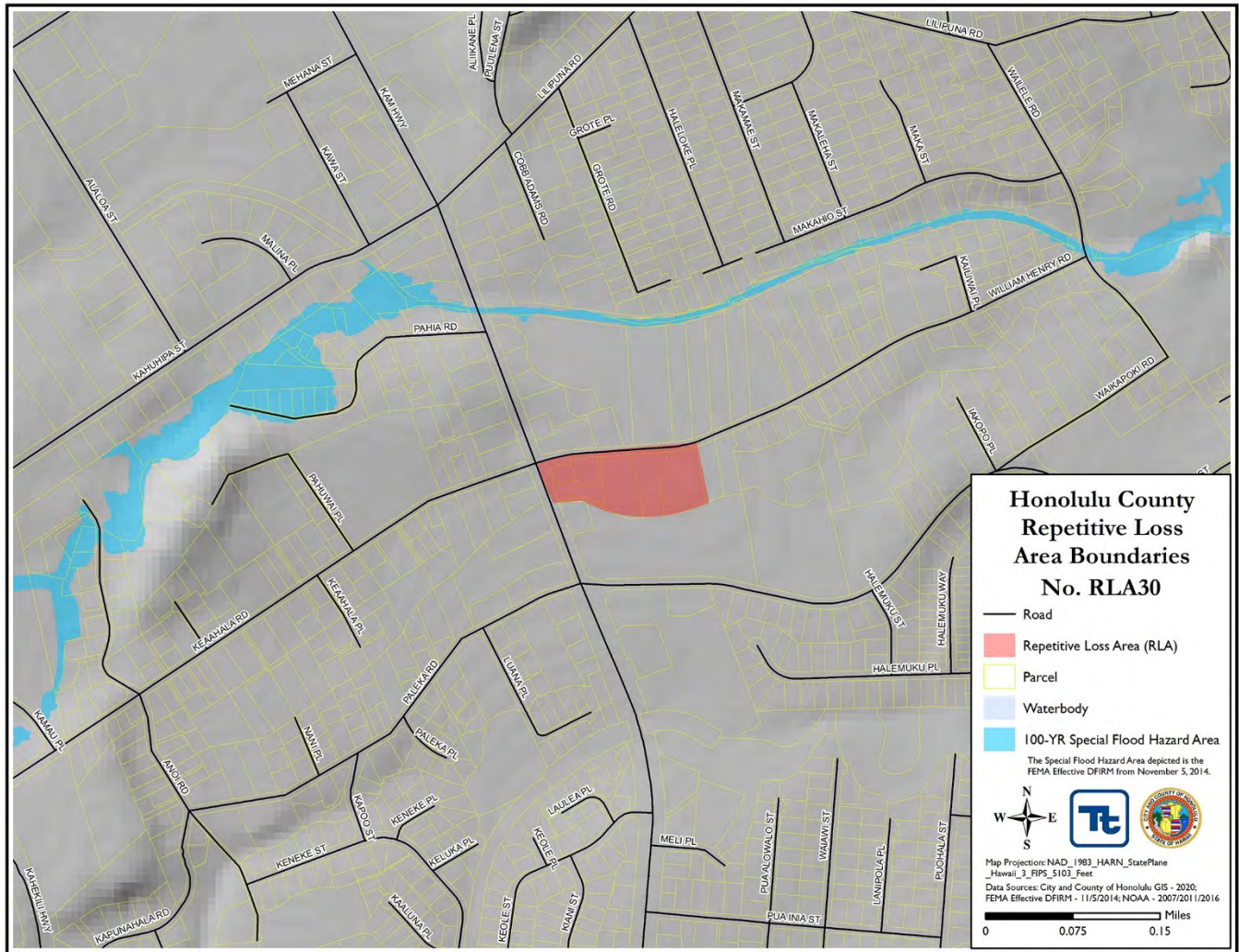
Table 7-36. Repetitive Loss Properties in Repetitive Loss Area 30

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
275972	Addresses omitted from public version of document	11/18, 2/18, 7/16	\$23,988.68
276940	Addresses omitted from public version of document	11/18, 2/18, 7/16	\$78,883.00

7.22.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.22.3 Map of Repetitive Loss Area



7.23 REPETITIVE LOSS AREA NO. 31

7.23.1 FEMA-Identified Repetitive Loss Properties

Table 7-37 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-37. Repetitive Loss Properties in Repetitive Loss Area 31

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
50322	<i>Addresses omitted from public version of document</i>	12/87, 9/82, 10/81	\$8,661.43

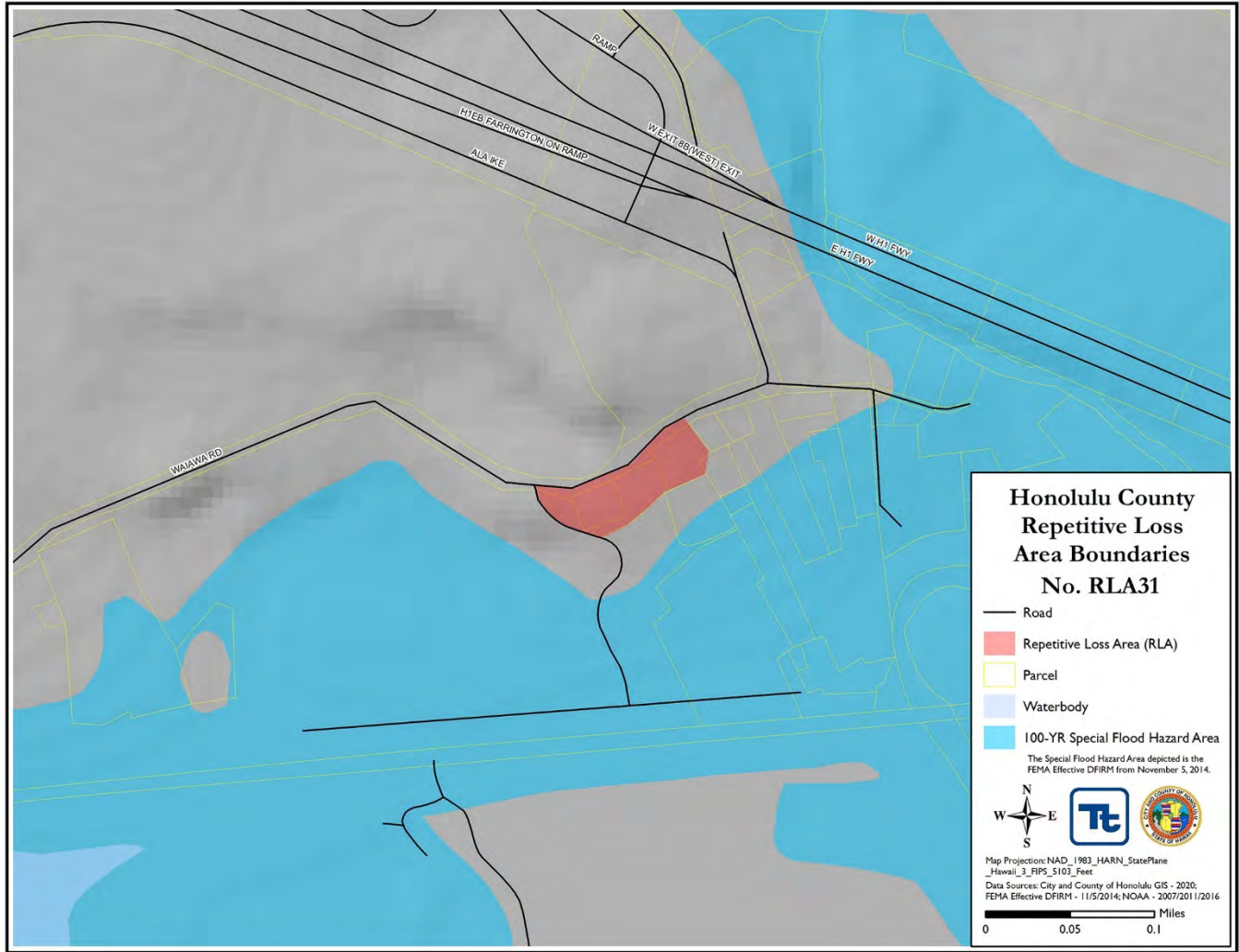
7.23.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-38 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-38. Additional Properties Included in Repetitive Loss Area 31

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
31-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage Maintenance and Elevation
31-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage Maintenance and Elevation

7.23.3 Map of Repetitive Loss Area



7.24 REPETITIVE LOSS AREA NO. 33

7.24.1 FEMA-Identified Repetitive Loss Properties

Table 7-39 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-39. Repetitive Loss Properties in Repetitive Loss Area 33

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
212582	<i>Addresses omitted from public version of document</i>	3/12, 10/09,	\$34,376.89

7.24.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.24.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.25 REPETITIVE LOSS AREA NO. 34

7.25.1 FEMA-Identified Repetitive Loss Properties

Table 7-40 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-40. Repetitive Loss Properties in Repetitive Loss Area 34

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
273440	<i>Addresses omitted from public version of document</i>	12/21, 12/10,	\$22,109.12

7.25.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.25.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.26 REPETITIVE LOSS AREA NO. 35

7.26.1 FEMA-Identified Repetitive Loss Properties

Table 7-41 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-41. Repetitive Loss Properties in Repetitive Loss Area 35

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
231329	<i>Addresses omitted from public version of document</i>	3/12, 6/06	\$87,744.78
59550	<i>Addresses omitted from public version of document</i>	3/91, 12/88	\$42,232.26

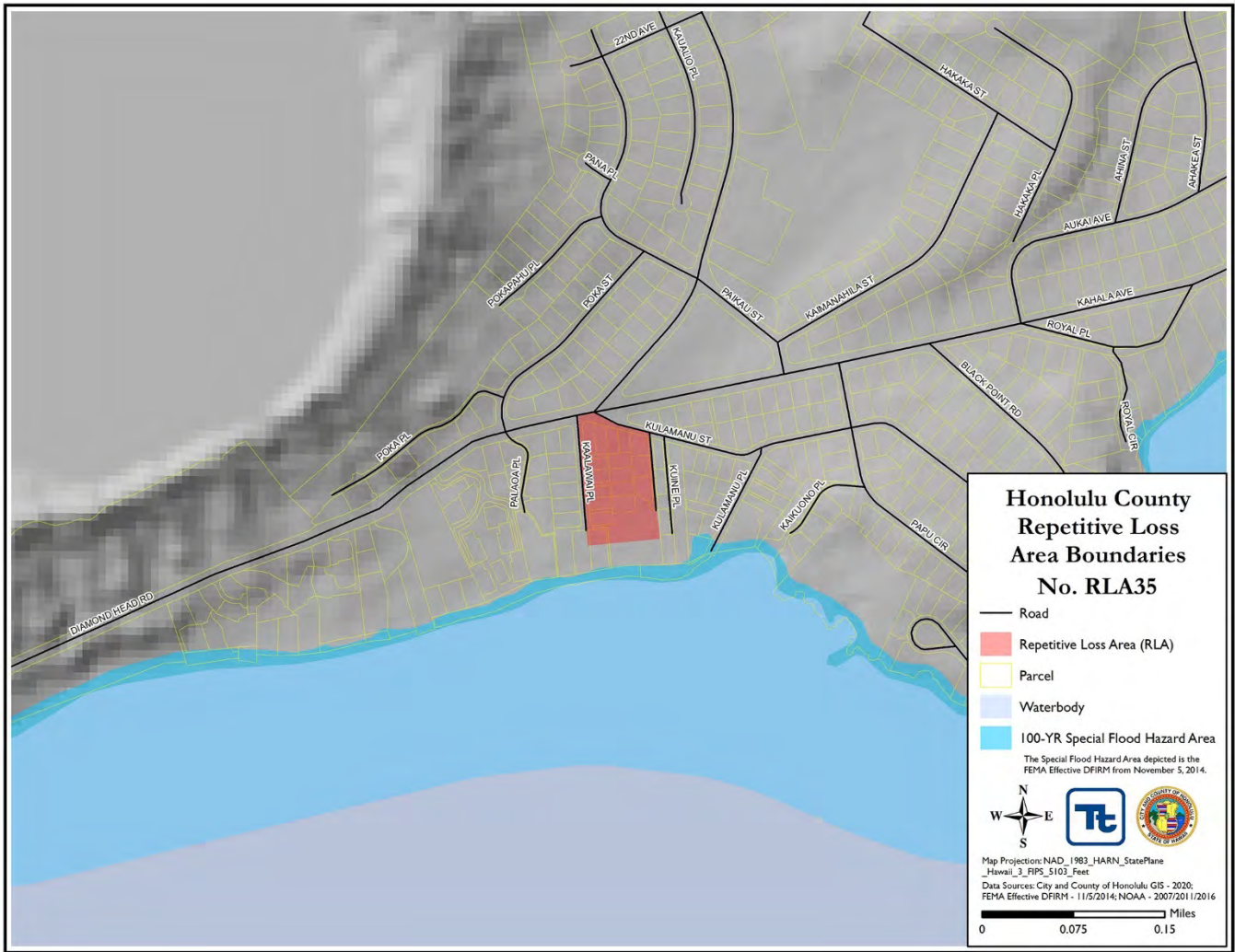
7.26.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-42 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-42. Additional Properties Included in Repetitive Loss Area 35

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
35-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
35-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
35-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.26.3 Map of Repetitive Loss Area



7.27 REPETITIVE LOSS AREA NO. 36

7.27.1 FEMA-Identified Repetitive Loss Properties

Table 7-43 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-43. Repetitive Loss Properties in Repetitive Loss Area 36

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59543	<i>Addresses omitted from public version of document</i>	11/90, 2/86,	\$2,835.00

7.27.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.27.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.28 REPETITIVE LOSS AREA NO. 37

7.28.1 FEMA-Identified Repetitive Loss Properties

Table 7-44 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-44. Repetitive Loss Properties in Repetitive Loss Area 37

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
212552	<i>Addresses omitted from public version of document</i>	3/12, 6/11,	\$127,834.42

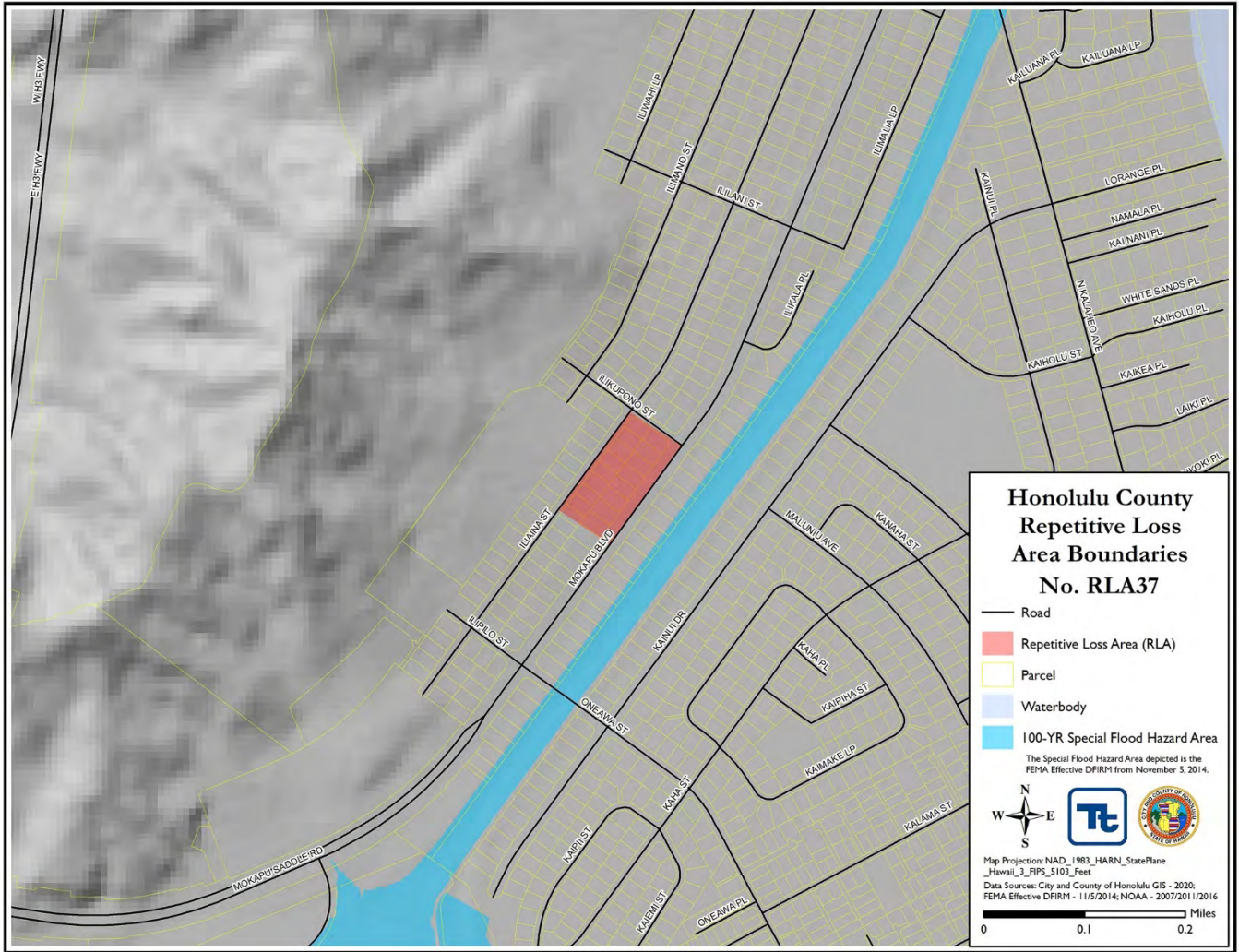
7.28.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-45 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-45. Additional Properties Included in Repetitive Loss Area 37

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
37-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage Maintenance and Elevation

7.28.3 Map of Repetitive Loss Area



7.29 REPETITIVE LOSS AREA NO. 38

7.29.1 FEMA-Identified Repetitive Loss Properties

Table 7-46 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-46. Repetitive Loss Properties in Repetitive Loss Area 38

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
255985	<i>Addresses omitted from public version of document</i>	2/17, 7/16	\$8,269.48

7.29.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.29.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.30 REPETITIVE LOSS AREA NO. 39

7.30.1 FEMA-Identified Repetitive Loss Properties

Table 7-47 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-47. Repetitive Loss Properties in Repetitive Loss Area 39

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
276301	<i>Addresses omitted from public version of document</i>	2/18, 3/12,	\$69,814.01

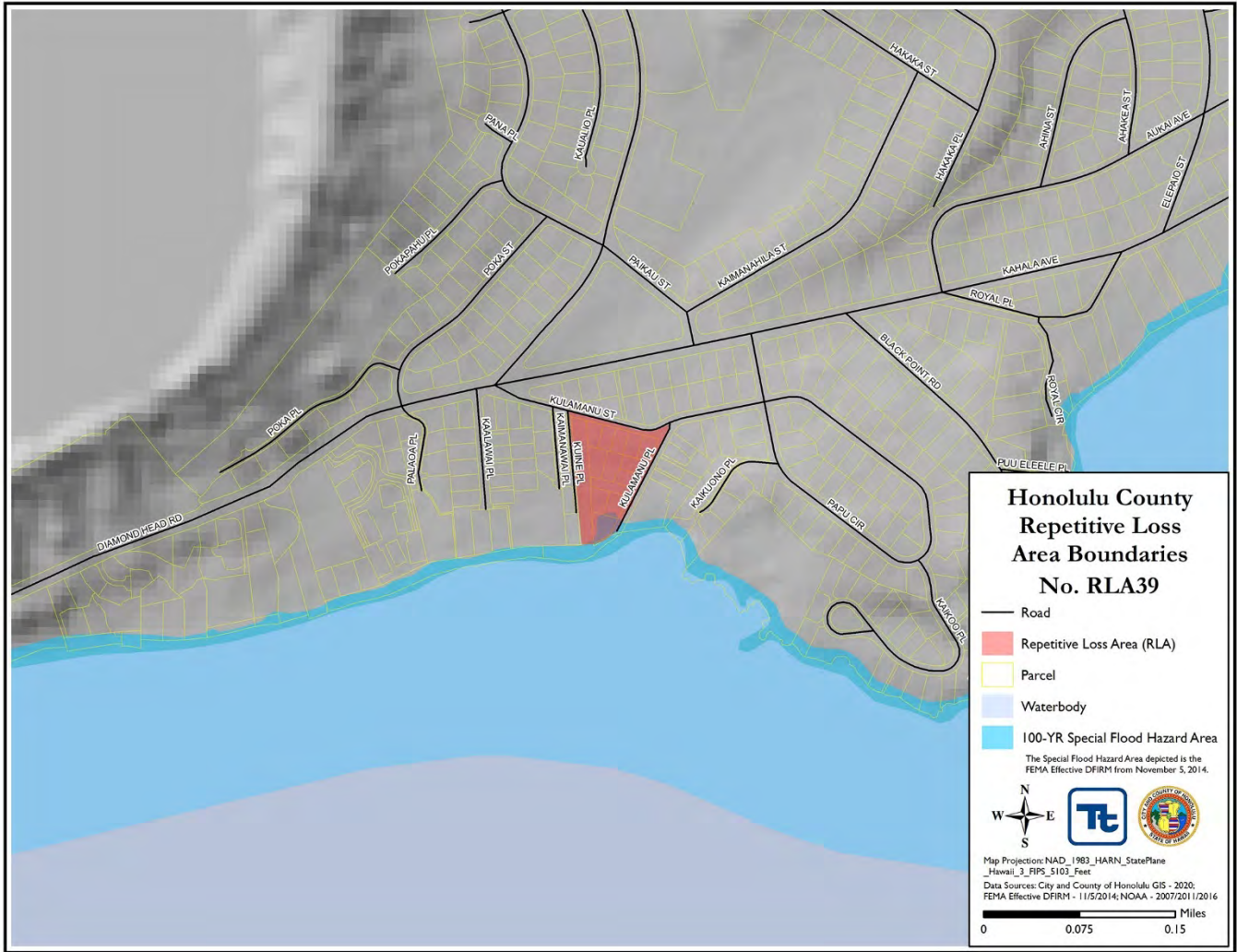
7.30.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-48 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-48. Additional Properties Included in Repetitive Loss Area 39

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
39-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.30.3 Map of Repetitive Loss Area



7.31 REPETITIVE LOSS AREA NO. 40

7.31.1 FEMA-Identified Repetitive Loss Properties

Table 7-49 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-49. Repetitive Loss Properties in Repetitive Loss Area 40

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
245657	<i>Addresses omitted from public version of document</i>	2/18, 3/12,	\$69,814.01

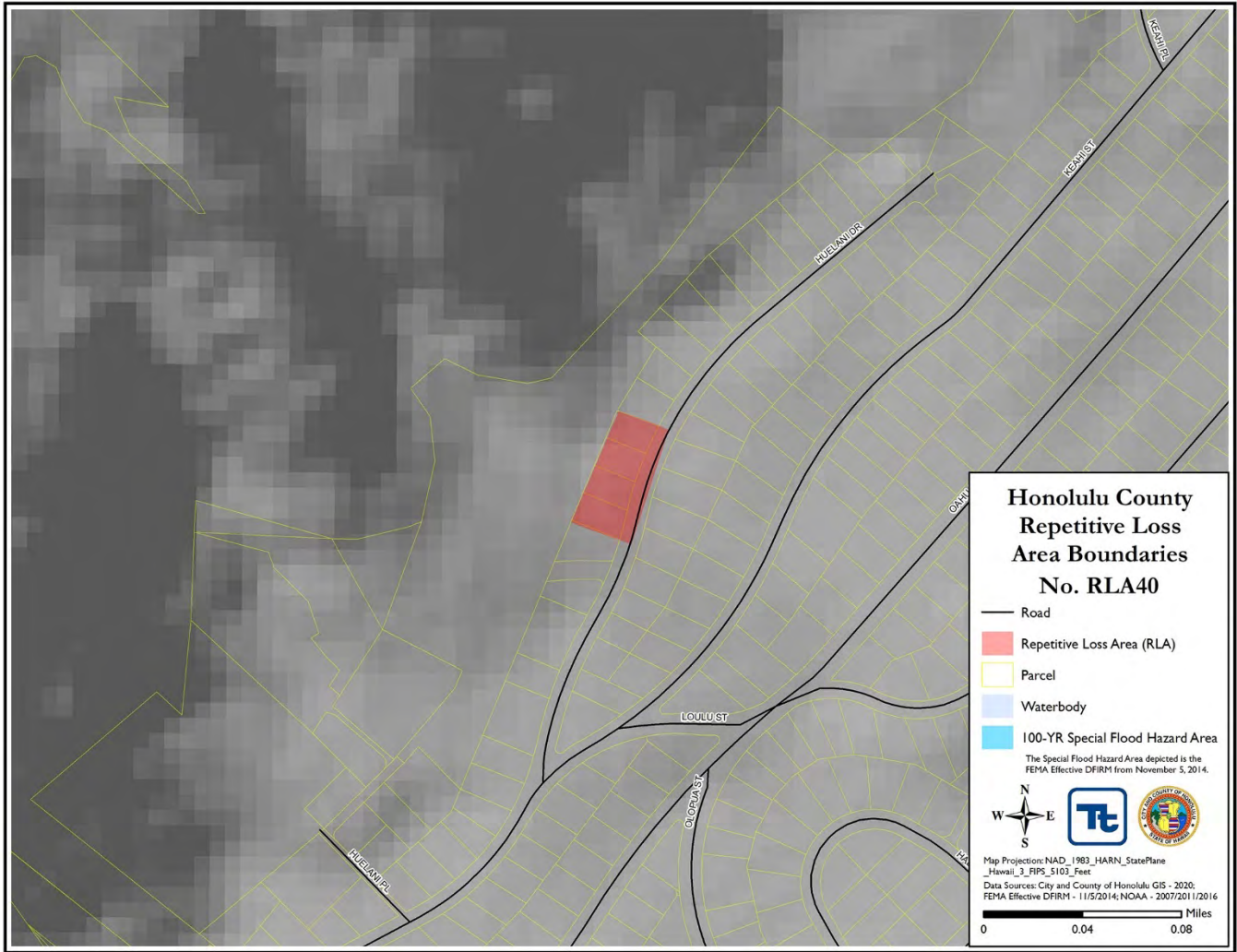
7.31.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-50 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-50. Additional Properties Included in Repetitive Loss Area 40

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
40-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.31.3 Map of Repetitive Loss Area



7.32 REPETITIVE LOSS AREA NO. 41

7.32.1 FEMA-Identified Repetitive Loss Properties

Table 7-51 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-51. Repetitive Loss Properties in Repetitive Loss Area 41

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
275416	<i>Addresses omitted from public version of document</i>	12/17,37/12,	\$19,364.44

7.32.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.32.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.33 REPETITIVE LOSS AREA NO. 42

7.33.1 FEMA-Identified Repetitive Loss Properties

Table 7-52 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-52. Repetitive Loss Properties in Repetitive Loss Area 42

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
254249	<i>Addresses omitted from public version of document</i>	8/16, 2/08,	\$28,115.84

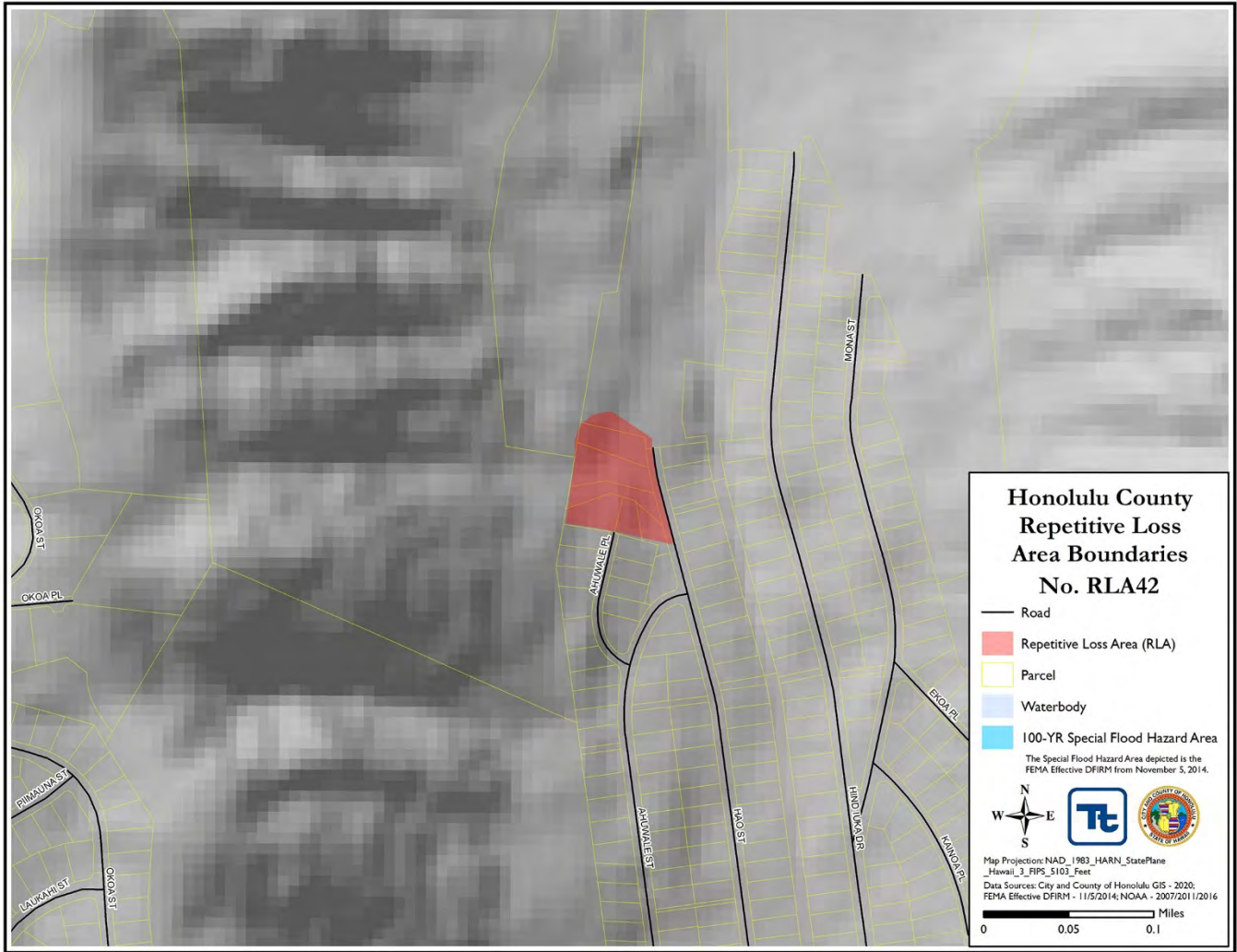
7.33.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-53 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-53. Additional Properties Included in Repetitive Loss Area 42

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
42-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.33.3 Map of Repetitive Loss Area



7.34 REPETITIVE LOSS AREA NO. 44

7.34.1 FEMA-Identified Repetitive Loss Properties

Table 7-54 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59556	<i>Addresses omitted from public version of document</i>	7/14, 3/91, 1/88	\$22,672.21
3451	<i>Addresses omitted from public version of document</i>	3/91, 1/88	\$7,075.37
9315	<i>Addresses omitted from public version of document</i>	7/14, 3/06, 1/97, 11/96, 3/96, 2/94, 11/92, 3/91	\$59,020.96
47244	<i>Addresses omitted from public version of document</i>	12/87, 2/85	\$8,208.54
14692	<i>Addresses omitted from public version of document</i>	2/94, 3/91, 1/88, 2/85, 11/84	\$42,247.32
59555	<i>Addresses omitted from public version of document</i>	7/14, 3/06, 2/94, 3/91, 1/88	\$4,255.87

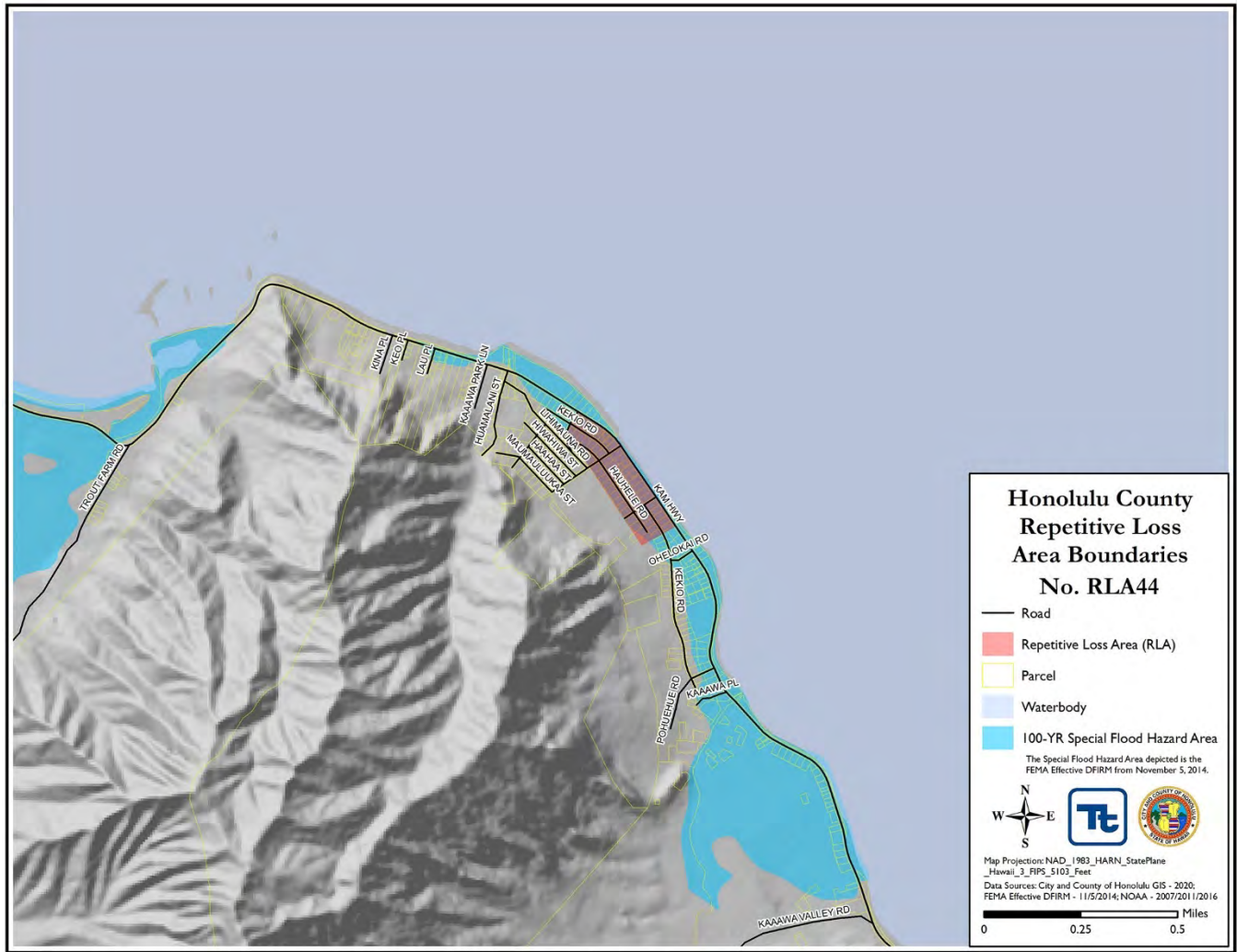
7.34.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-55 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
44-1	<i>Addresses omitted from public version of document</i>	1	Slab	Fair	Elevation
44-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-3	<i>Addresses omitted from public version of document</i>	1	Slightly Elevated	Good	Elevation
44-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
44-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-6	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-8	<i>Addresses omitted from public version of document</i>	1	Slightly Elevated	Good	Elevation
44-9	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
44-10	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
44-12	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-13	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-14	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-15	<i>Addresses omitted from public version of document</i>	1	Slightly Elevated	Good	Elevation
44-16	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
44-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
44-18	<i>Addresses omitted from public version of document</i>	1	Slightly Elevated	Good	Elevation
44-19	<i>Addresses omitted from public version of document</i>	1	Slightly Elevated	Good	Elevation
44-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
44-21	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
44-22	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-23	<i>Addresses omitted from public version of document</i>	1	Slightly Elevated	Good	Elevation
44-24	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
44-25	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.34.3 Map of Repetitive Loss Area



7.35 REPETITIVE LOSS AREA NO. 45

7.35.1 FEMA-Identified Repetitive Loss Properties

Table 7-56 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-56. Repetitive Loss Properties in Repetitive Loss Area 45

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
9168	<i>Addresses omitted from public version of document</i>	12/92, 3/91, 2/85	\$13,662.63

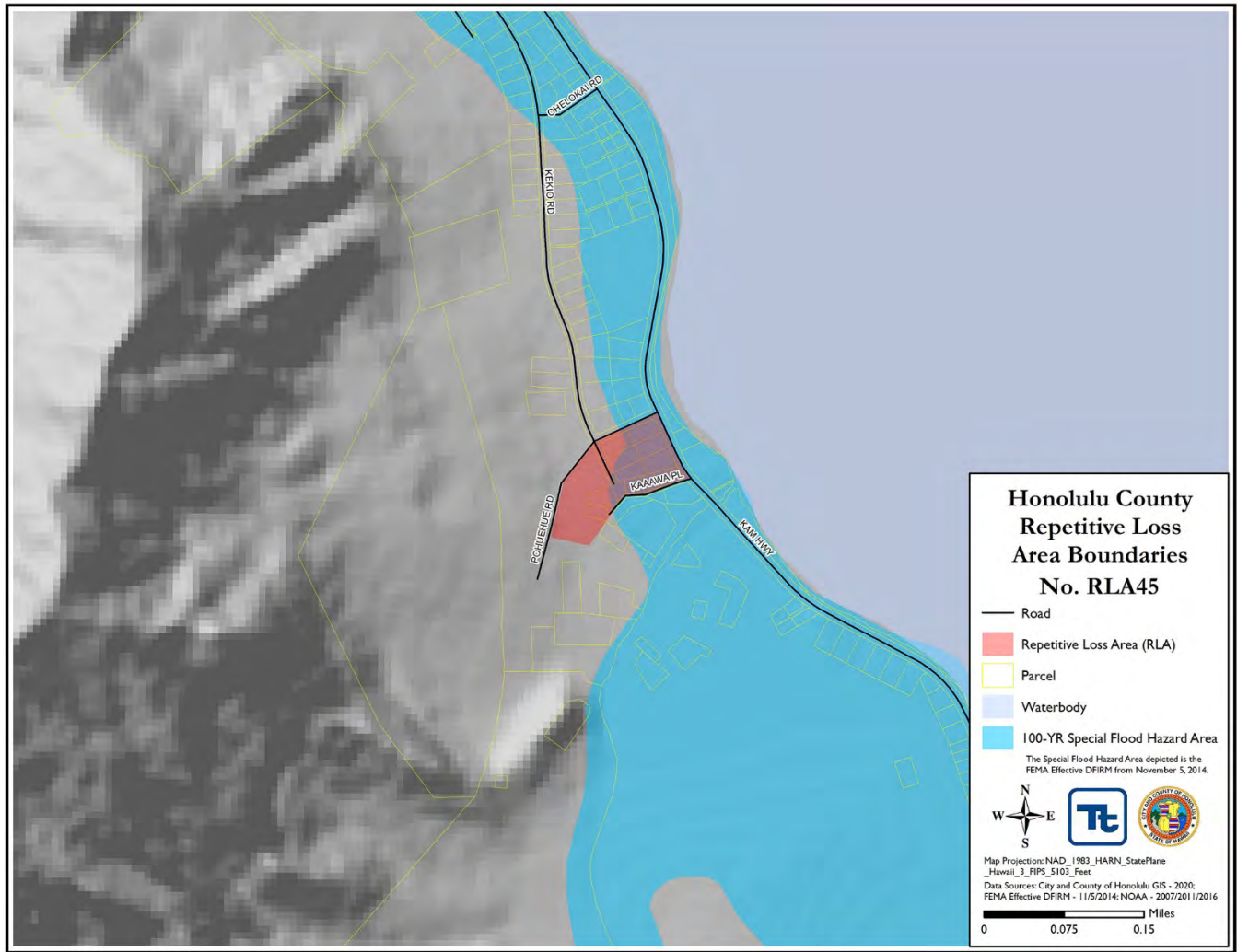
7.35.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-57 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-57. Additional Properties Included in Repetitive Loss Area 45

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
45-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
45-10	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.35.3 Map of Repetitive Loss Area



7.36 REPETITIVE LOSS AREA NO. 46

7.36.1 FEMA-Identified Repetitive Loss Properties

Table 7-58 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-58. Repetitive Loss Properties in Repetitive Loss Area 46

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
9169	<i>Addresses omitted from public version of document</i>	3/06, 10/92, 3/91	\$61,137.37
74993	<i>Addresses omitted from public version of document</i>	3/12, 3/06, 3/91, 12/88	\$69,375.59

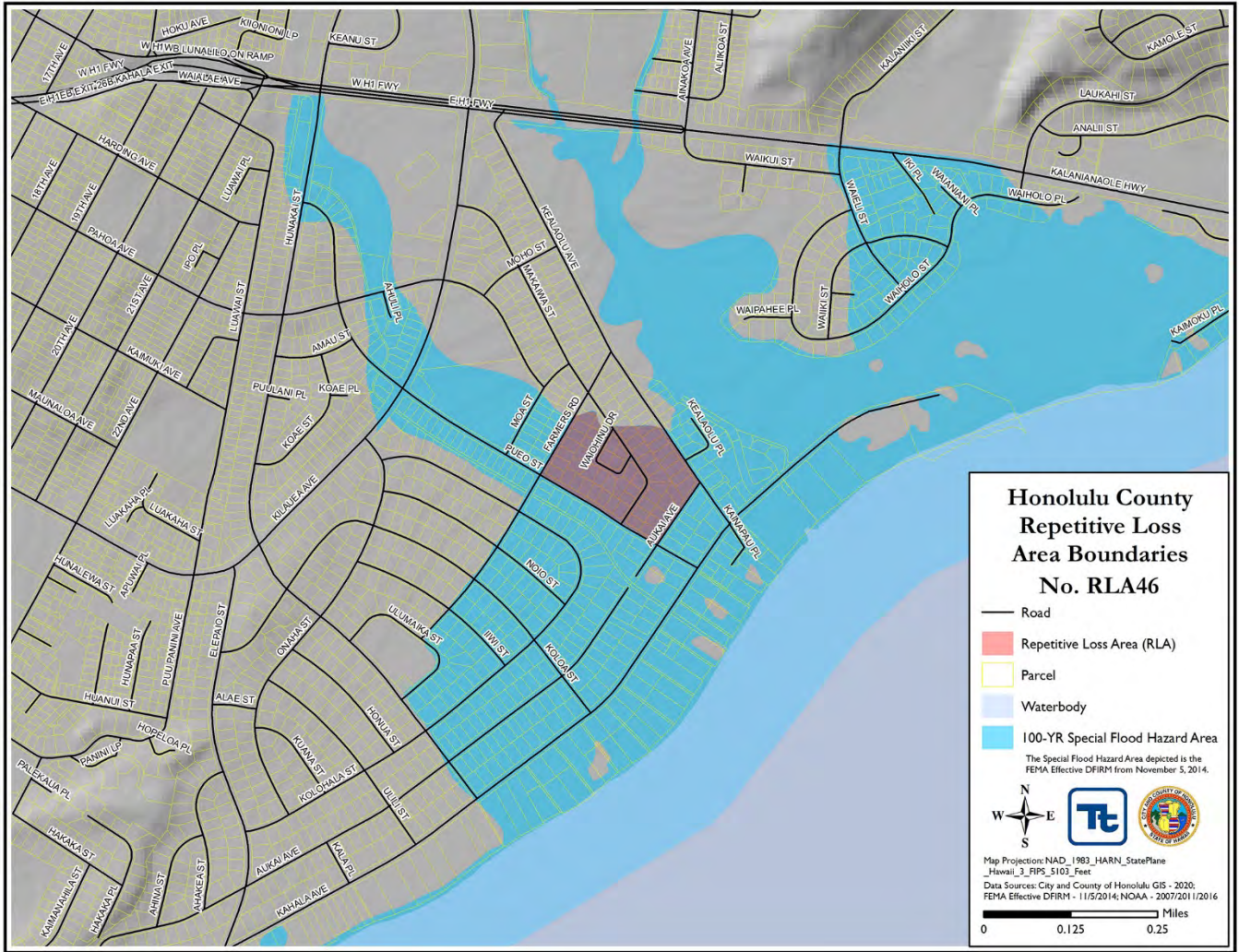
7.36.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-59 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-59. Additional Properties Included in Repetitive Loss Area 46

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
46-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.36.3 Map of Repetitive Loss Area



7.37 REPETITIVE LOSS AREA NO. 47

7.37.1 FEMA-Identified Repetitive Loss Properties

Table 7-60 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-60. Repetitive Loss Properties in Repetitive Loss Area 47

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
9170	<i>Addresses omitted from public version of document</i>	3/91, 11/90	\$3,244.08

7.37.2 Additional Properties Included in Repetitive Loss Area

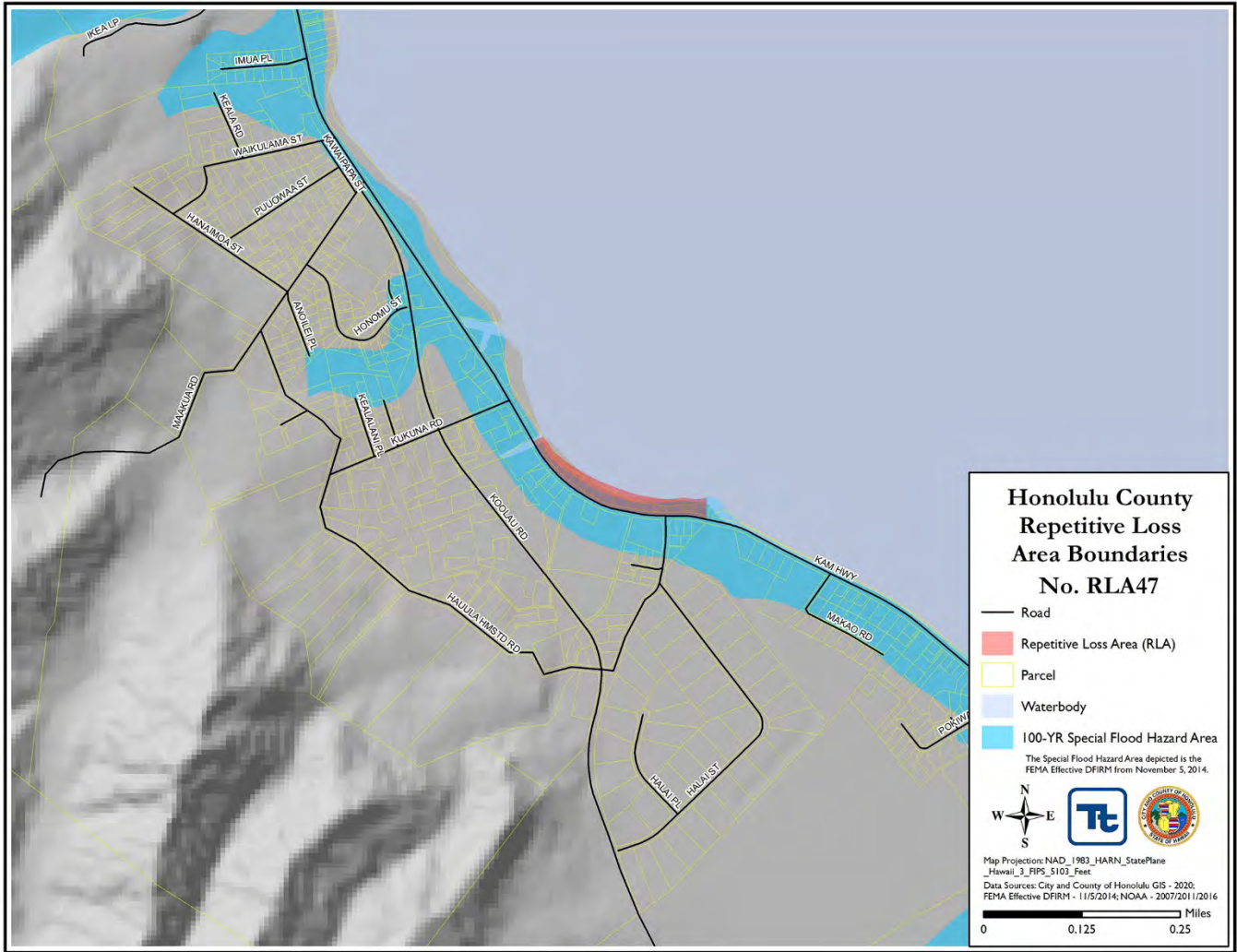
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-61 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-61. Additional Properties Included in Repetitive Loss Area 47

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
47-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
47-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
47-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-7	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
47-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-9	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
47-10	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
47-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-13	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
47-14	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-15	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-16	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-18	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
47-19	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
47-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
47-21	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.37.3 Map of Repetitive Loss Area



7.38 REPETITIVE LOSS AREA NO. 50

7.38.1 FEMA-Identified Repetitive Loss Properties

Table 7-62 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

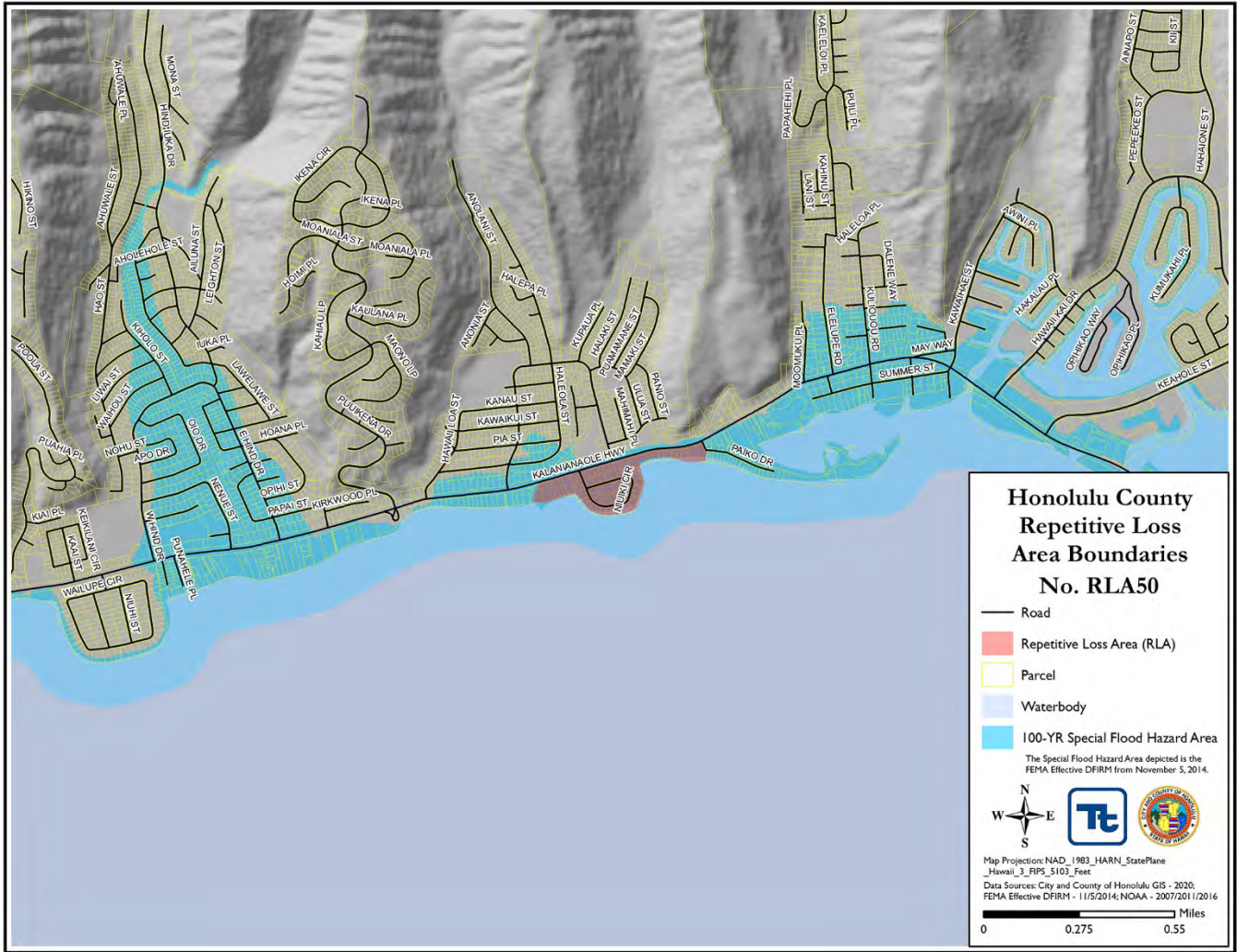
Table 7-62. Repetitive Loss Properties in Repetitive Loss Area 50

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59548	<i>Addresses omitted from public version of document</i>	4/18, 3/91, 12/87	\$169,581.85
276700	<i>Addresses omitted from public version of document</i>	4/18, 3/12	\$42,247.32
59549	<i>Addresses omitted from public version of document</i>	4/18, 9/92, 12/87	\$77,040.95
276891	<i>Addresses omitted from public version of document</i>	4/18, 3/12	\$388,112.10
14313	<i>Addresses omitted from public version of document</i>	4/18, 9/92, 3/91, 1/88	\$590,655.66

7.38.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.38.3 Map of Repetitive Loss Area



7.39 REPETITIVE LOSS AREA NO. 52

7.39.1 FEMA-Identified Repetitive Loss Properties

Table 7-63 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-63. Repetitive Loss Properties in Repetitive Loss Area 52

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
14690	<i>Addresses omitted from public version of document</i>	7/89, 2/83, 1/81, 3/80	\$19,299.37

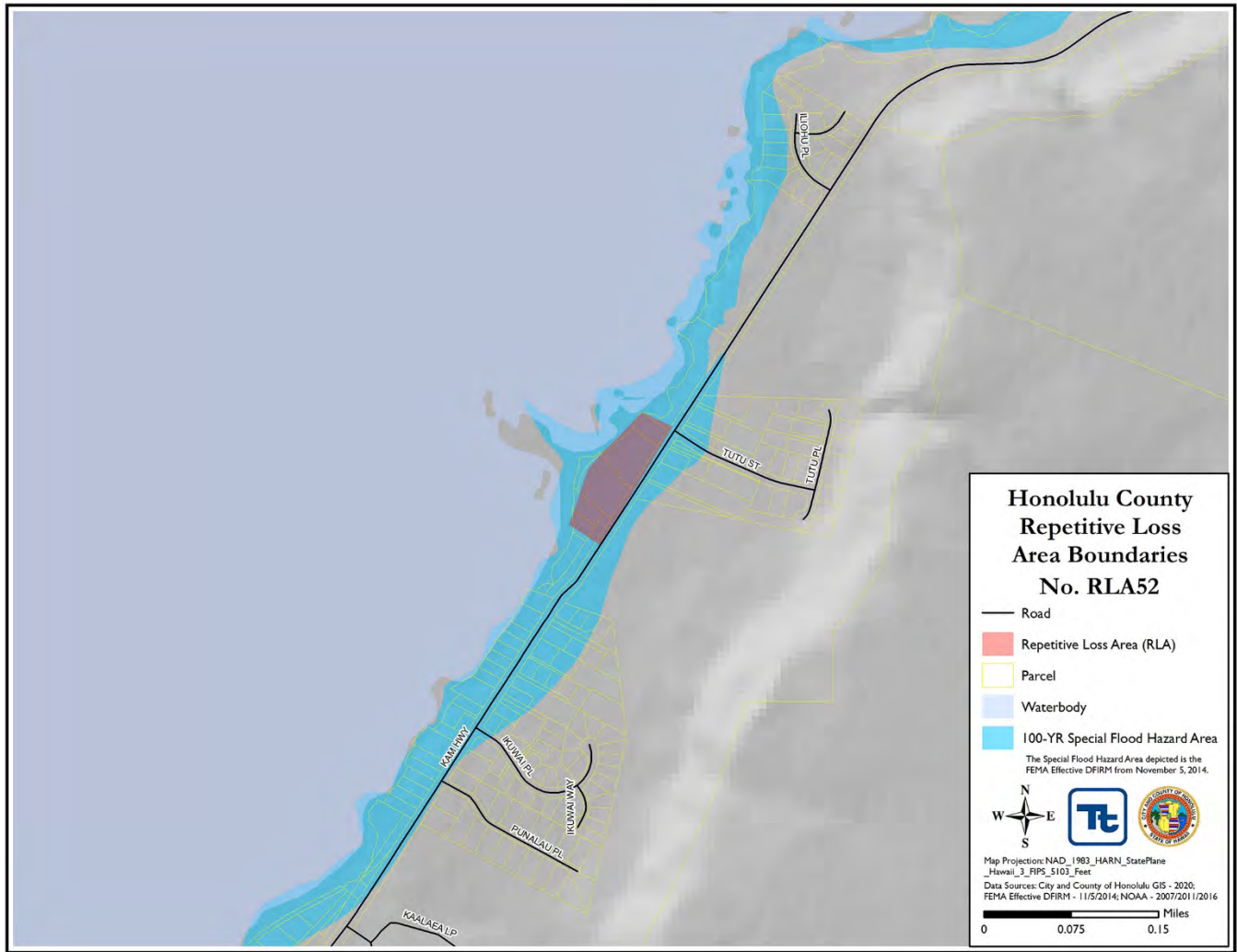
7.39.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-64 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-64. Additional Properties Included in Repetitive Loss Area 52

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
52-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
52-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.39.3 Map of Repetitive Loss Area



7.40 REPETITIVE LOSS AREA NO. 55

7.40.1 FEMA-Identified Repetitive Loss Properties

Table 7-65 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-65. Repetitive Loss Properties in Repetitive Loss Area 55

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
31479	<i>Addresses omitted from public version of document</i>	2/85, 3/82	\$11,509.26

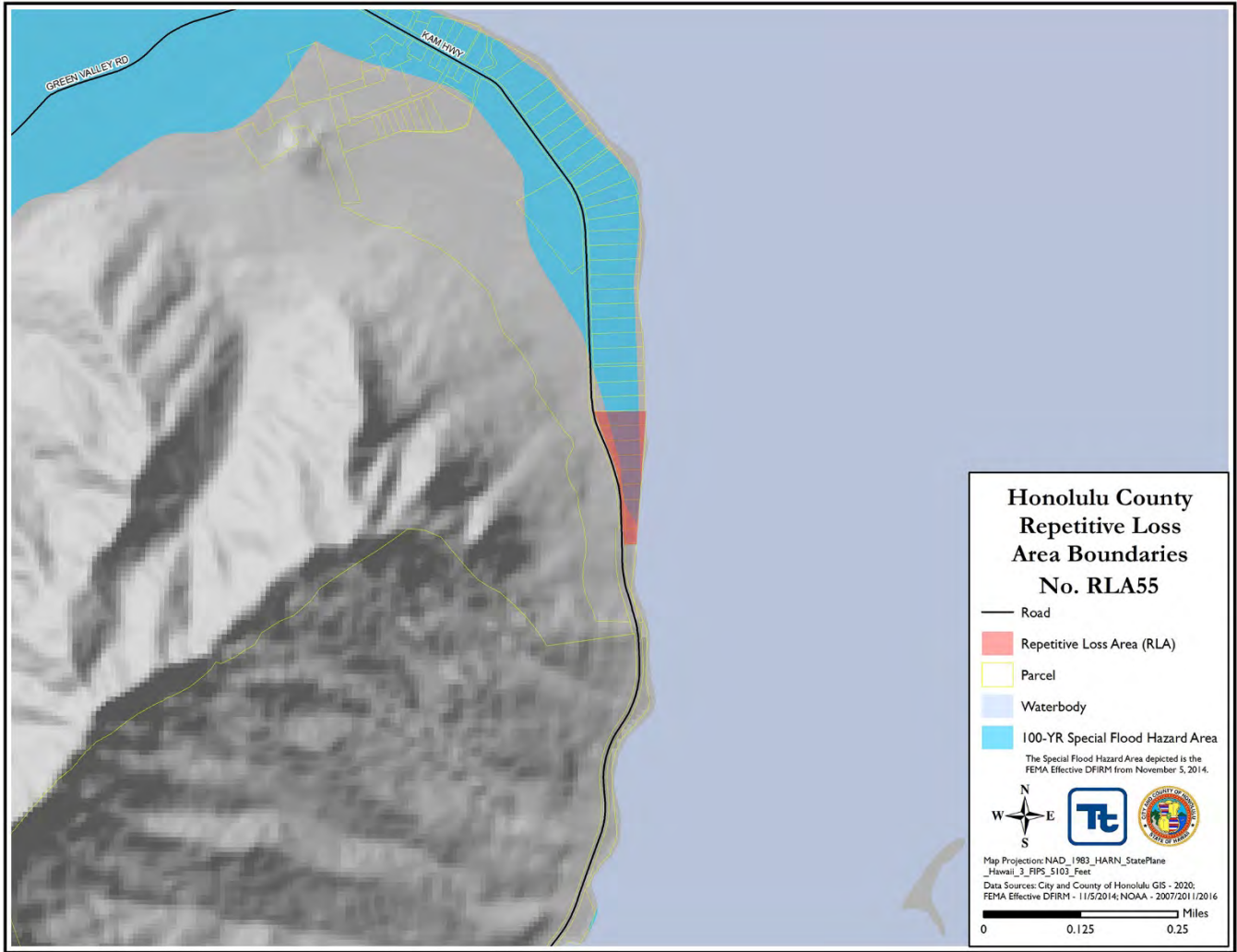
7.40.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-66 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-66. Additional Properties Included in Repetitive Loss Area 55

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
55-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
55-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
55-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.40.3 Map of Repetitive Loss Area



7.41 REPETITIVE LOSS AREA NO. 56

7.41.1 FEMA-Identified Repetitive Loss Properties

Table 7-67 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-67. Repetitive Loss Properties in Repetitive Loss Area 56

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
31481	<i>Addresses omitted from public version of document</i>	12/87, 1/80	\$21,605.92

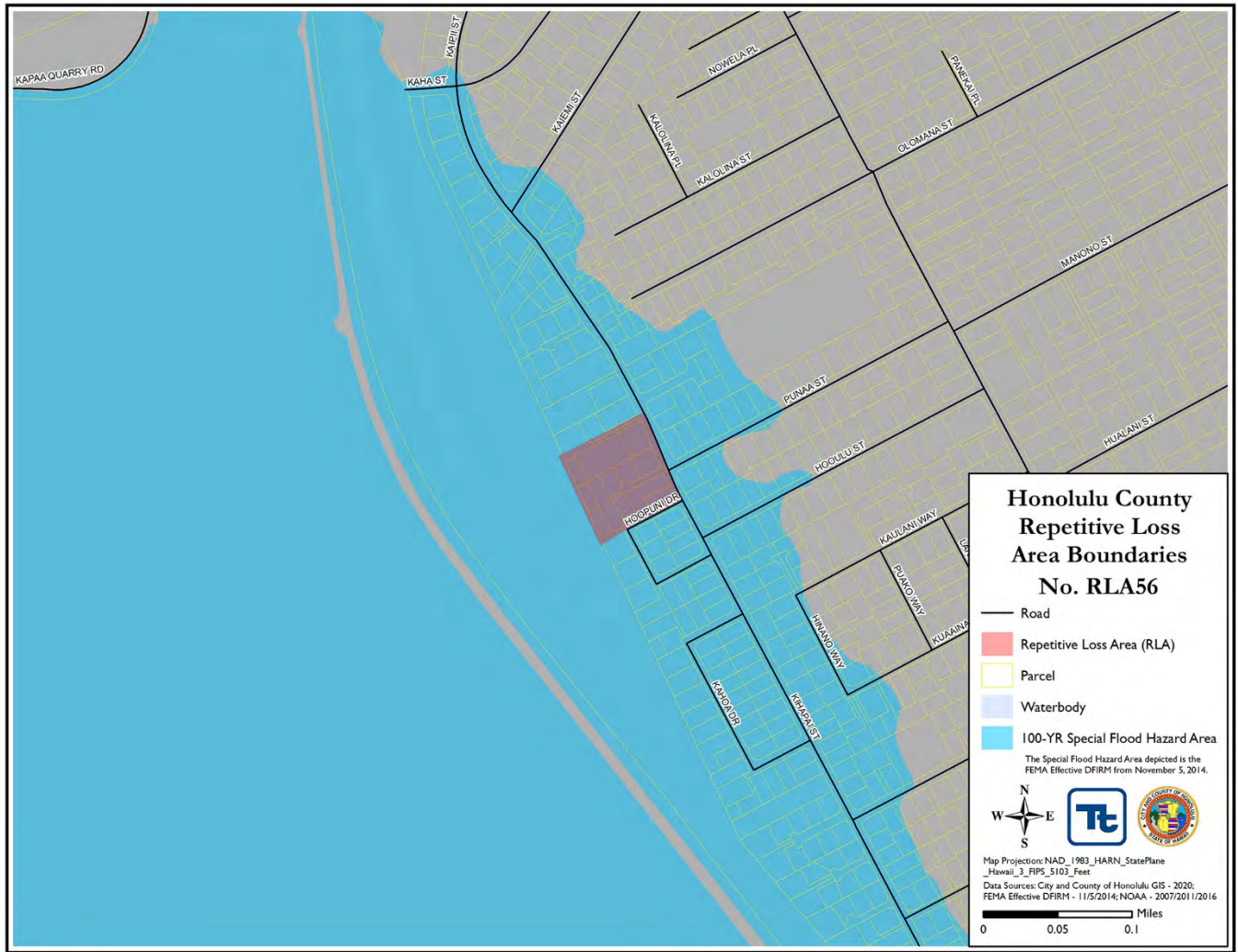
7.41.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-68 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-68. Additional Properties Included in Repetitive Loss Area 56

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
56-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
56-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
56-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
56-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
56-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
56-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
56-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
56-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.41.3 Map of Repetitive Loss Area



7.42 REPETITIVE LOSS AREA NO. 57

7.42.1 FEMA-Identified Repetitive Loss Properties

Table 7-69 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-69. Repetitive Loss Properties in Repetitive Loss Area 57

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
70822	<i>Addresses omitted from public version of document</i>	4/18, 11/93, 10/92	\$156,344.09
31482	<i>Addresses omitted from public version of document</i>	11/93, 3/91, 1/80, 10/78	\$21,568.43

7.42.2 Additional Properties Included in Repetitive Loss Area

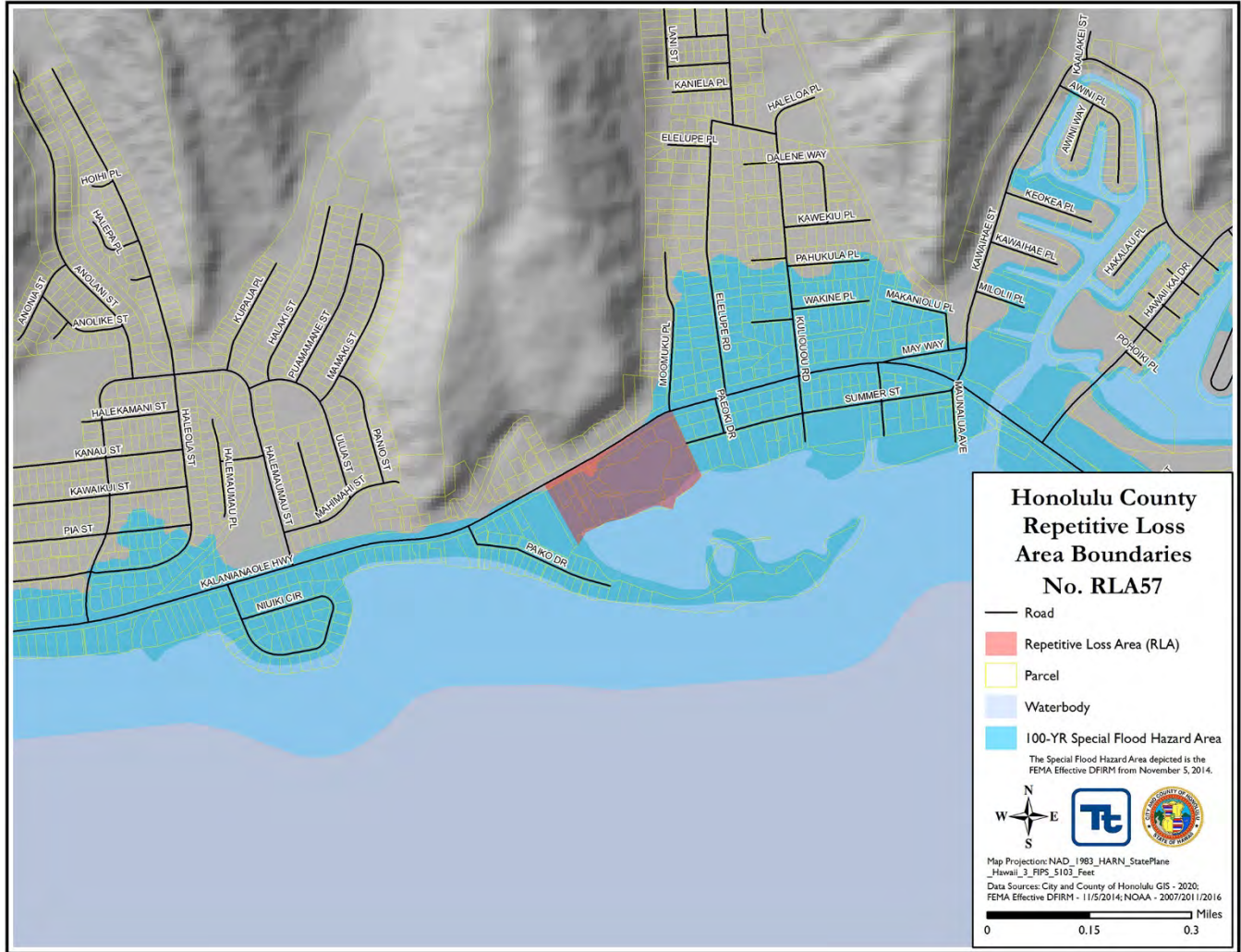
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-70 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-70. Additional Properties Included in Repetitive Loss Area 57

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
57-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
57-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
57-13	Addresses omitted from public version of document	1	Slab	Good	Elevation
57-14	Addresses omitted from public version of document	1	Slab	Good	Elevation
57-15	Addresses omitted from public version of document	1	Slab	Good	Elevation

7.42.3 Map of Repetitive Loss Area



7.43 REPETITIVE LOSS AREA NO. 58

7.43.1 FEMA-Identified Repetitive Loss Properties

Table 7-71 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-71. Repetitive Loss Properties in Repetitive Loss Area 58

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
43233	<i>Addresses omitted from public version of document</i>	3/91, 11/84	\$3,588.97
302309	<i>Addresses omitted from public version of document</i>	11/96, 2/93	\$9,508.14

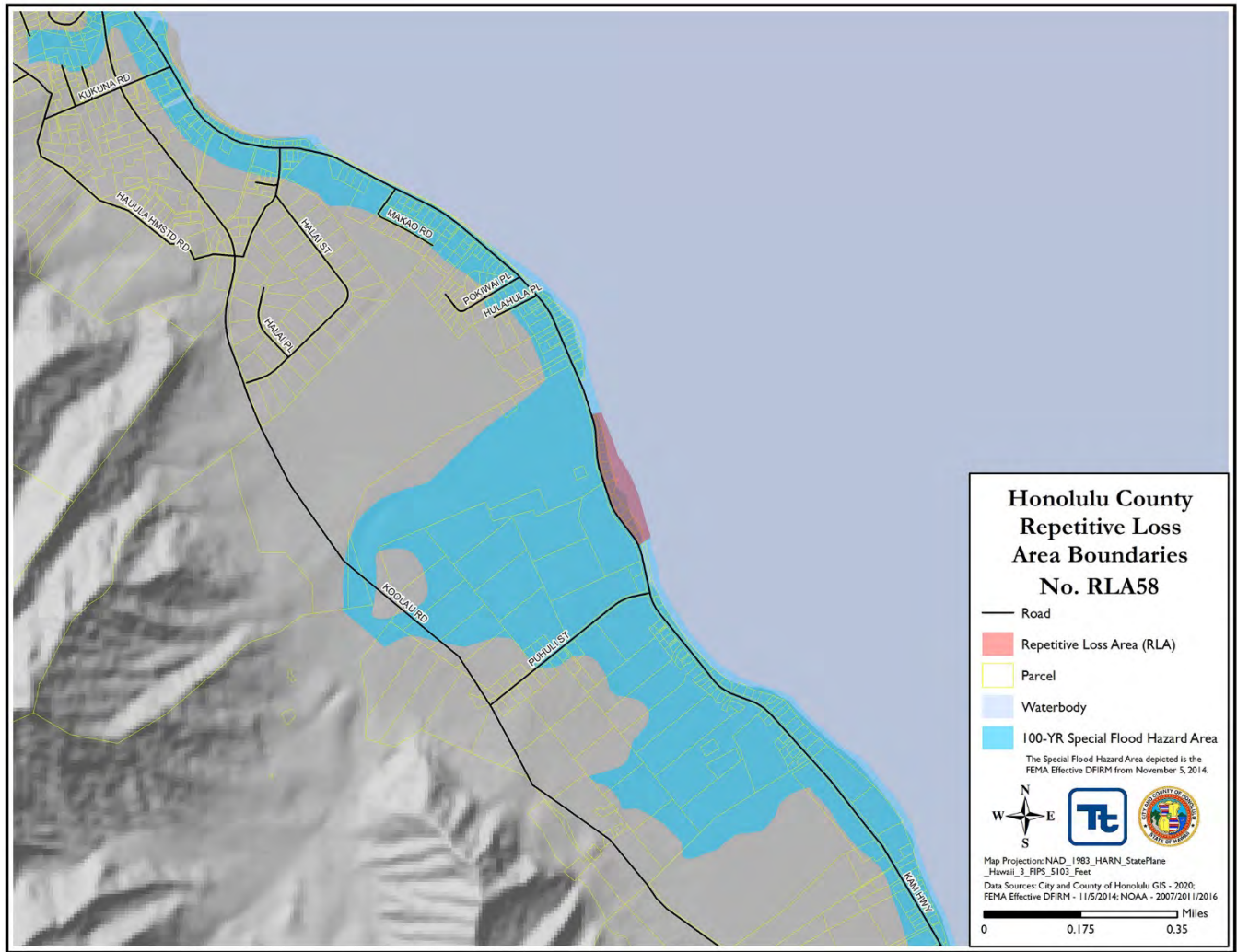
7.43.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-72 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-72. Additional Properties Included in Repetitive Loss Area 58

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
58-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.43.3 Map of Repetitive Loss Area



7.44 REPETITIVE LOSS AREA NO. 59

7.44.1 FEMA-Identified Repetitive Loss Properties

Table 7-73 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-73. Repetitive Loss Properties in Repetitive Loss Area 59

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
56106	<i>Addresses omitted from public version of document</i>	6/11, 12/08, 3/06, 5/02, 9/94, 2/94, 3/91, 4/89, 12/87	\$109,711.22

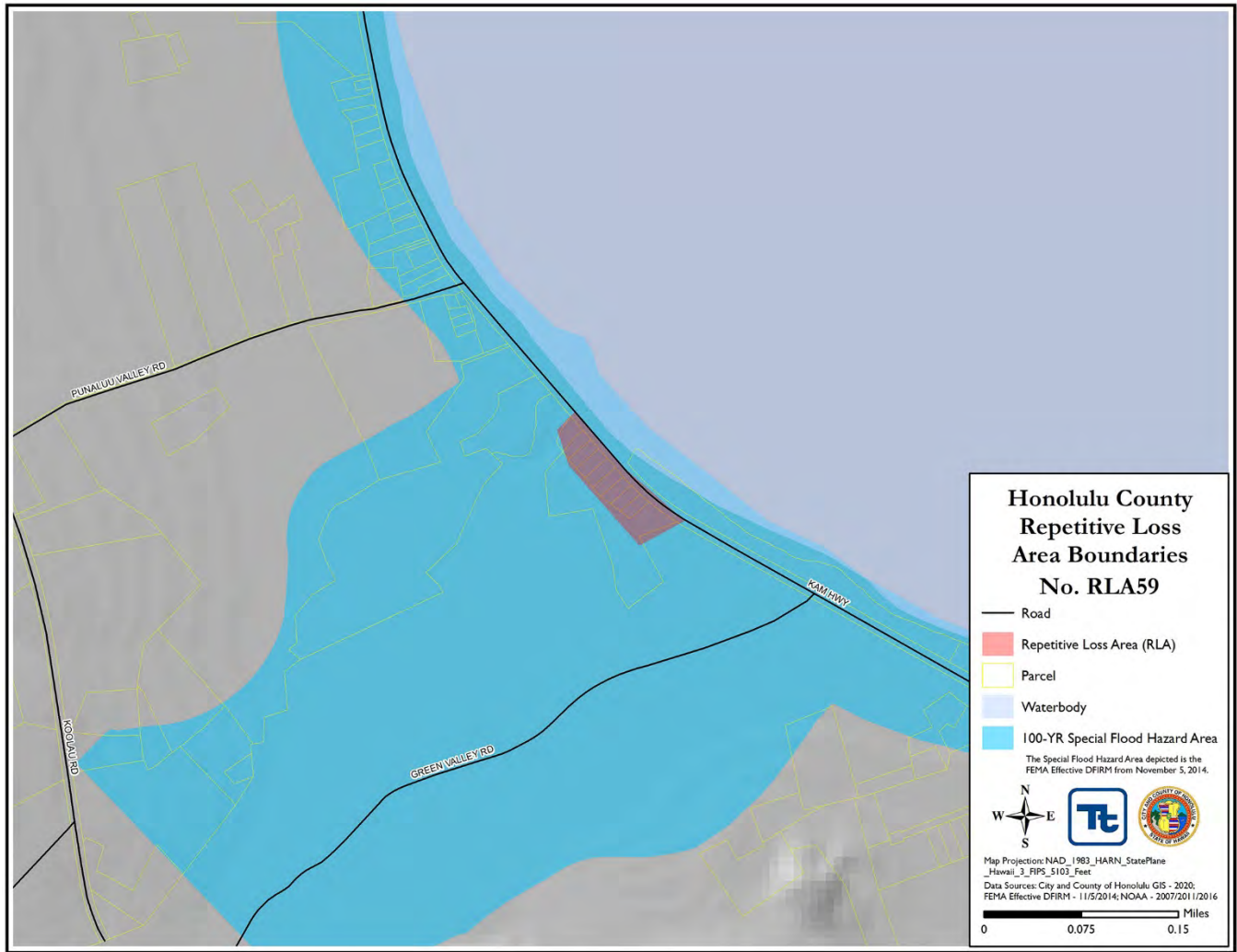
7.44.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-74 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-74. Additional Properties Included in Repetitive Loss Area 59

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
58-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
58-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.44.3 Map of Repetitive Loss Area



7.45 REPETITIVE LOSS AREA NO. 60

7.45.1 FEMA-Identified Repetitive Loss Properties

Table 7-75 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-75. Repetitive Loss Properties in Repetitive Loss Area 60

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59544	<i>Addresses omitted from public version of document</i>	2/17, 11/96, 3/91, 1/89	\$75,174.81

7.45.2 Additional Properties Included in Repetitive Loss Area

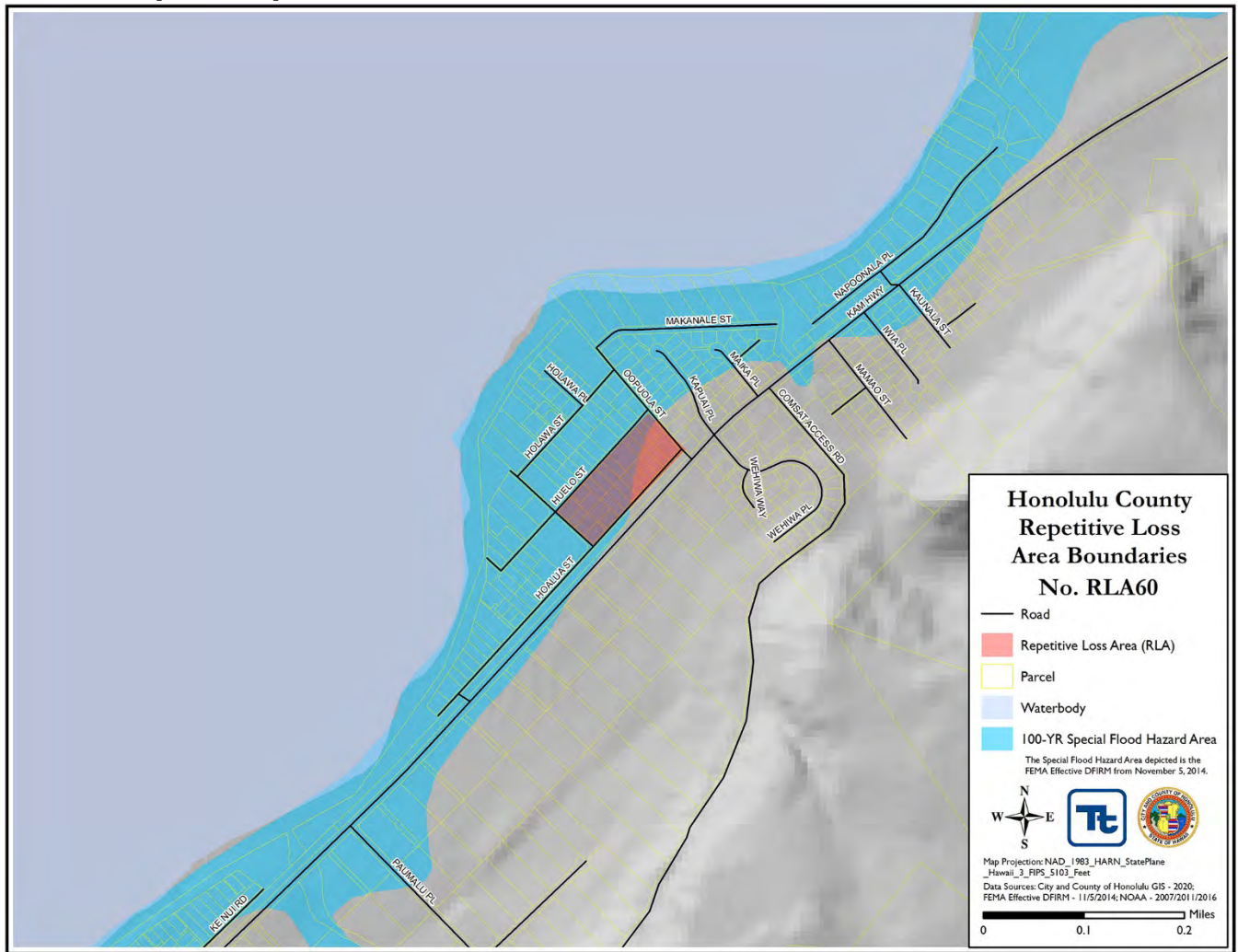
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-76 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-76. Additional Properties Included in Repetitive Loss Area 60

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
60-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
60-13	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
60-14	Addresses omitted from public version of document	1	Slab	Good	Elevation
60-15	Addresses omitted from public version of document	1	Slab	Good	Elevation
60-16	Addresses omitted from public version of document	1	Slab	Good	Elevation
60-17	Addresses omitted from public version of document	1	Slab	Good	Elevation
60-18	Addresses omitted from public version of document	1	Slab	Good	Elevation
60-19	Addresses omitted from public version of document	1	Slab	Good	Elevation

7.45.3 Map of Repetitive Loss Area



7.46 REPETITIVE LOSS AREA NO. 61

7.46.1 FEMA-Identified Repetitive Loss Properties

Table 7-77 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-77. Repetitive Loss Properties in Repetitive Loss Area 61

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59569	<i>Addresses omitted from public version of document</i>	1/88, 1/80	\$35,812.75

7.46.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-78 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-78. Additional Properties Included in Repetitive Loss Area 61

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
61-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
61-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
61-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.46.3 Map of Repetitive Loss Area



7.47 REPETITIVE LOSS AREA NO. 62

7.47.1 FEMA-Identified Repetitive Loss Properties

Table 7-79 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-79. Repetitive Loss Properties in Repetitive Loss Area 62

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59577	<i>Addresses omitted from public version of document</i>	3/91, 3/82, 1/82	\$24,877.68
183398	<i>Addresses omitted from public version of document</i>	12/08, 11/03, 12/95	\$67,123.94
59575	<i>Addresses omitted from public version of document</i>	12/08, 3/91, 11/84	\$45,607.43
184995	<i>Addresses omitted from public version of document</i>	3/12, 12/08, 3/91	\$73,635.48

7.47.2 Additional Properties Included in Repetitive Loss Area

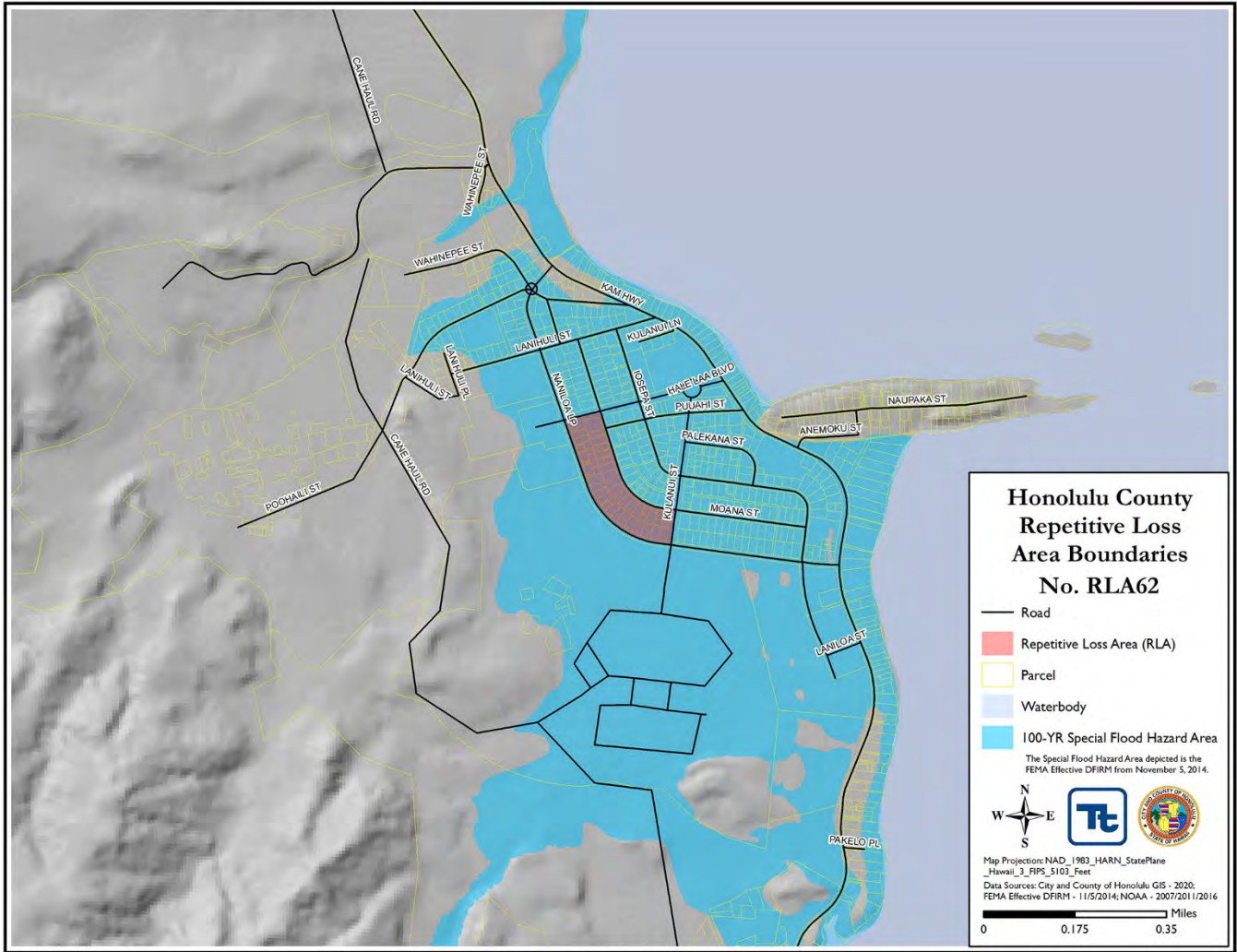
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-80 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-80. Additional Properties Included in Repetitive Loss Area 63

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
62-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
62-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-13	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-14	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-15	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-16	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-18	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-19	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-21	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
62-22	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.47.3 Map of Repetitive Loss Area



7.48 REPETITIVE LOSS AREA NO. 63

7.48.1 FEMA-Identified Repetitive Loss Properties

Table 7-81 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-81. Repetitive Loss Properties in Repetitive Loss Area 63

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59576	<i>Addresses omitted from public version of document</i>	3/91, 3/82	\$24,276.26

7.48.2 Additional Properties Included in Repetitive Loss Area

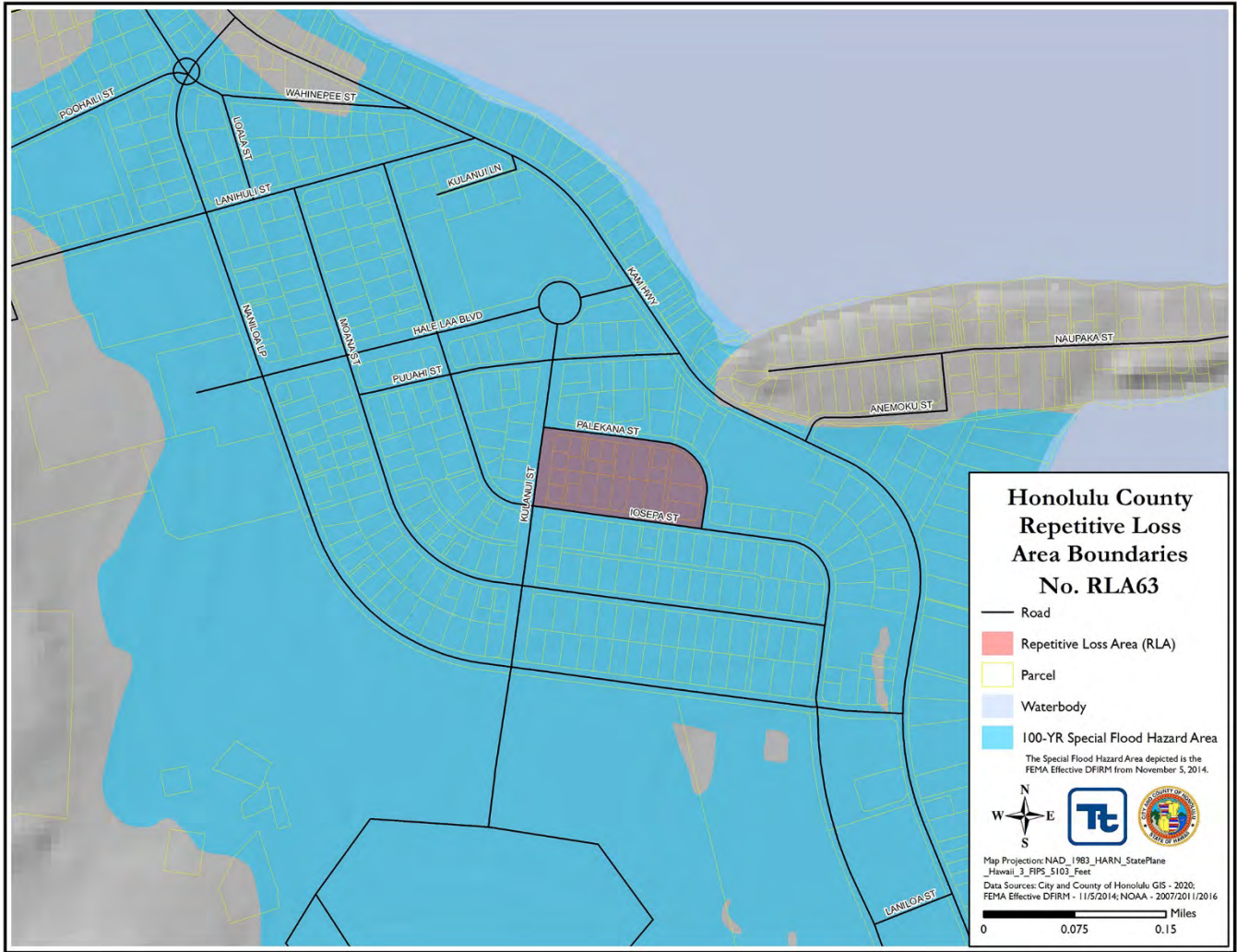
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-82 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-82. Additional Properties Included in Repetitive Loss Area 63

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
63-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-13	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
63-14	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-15	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-16	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-18	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-19	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
63-21	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.48.3 Map of Repetitive Loss Area



7.49 REPETITIVE LOSS AREA NO. 64

7.49.1 FEMA-Identified Repetitive Loss Properties

Table 7-83 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-83. Repetitive Loss Properties in Repetitive Loss Area 64

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
182437	<i>Addresses omitted from public version of document</i>	3/12, 12/08, 3/91	\$63,247.59

7.49.2 Additional Properties Included in Repetitive Loss Area

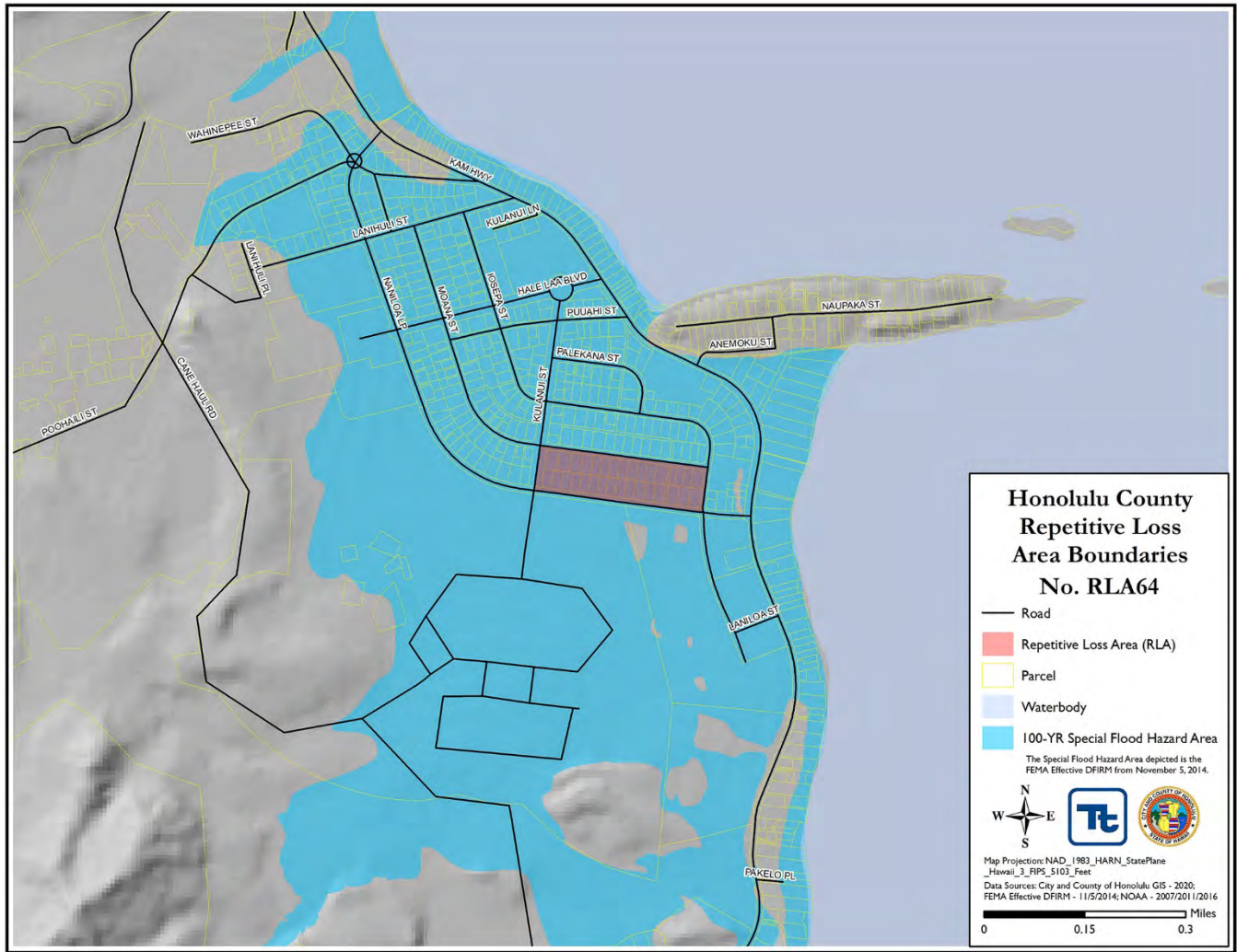
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-84 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-84. Additional Properties Included in Repetitive Loss Area 63

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
64-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-13	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
64-14	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-15	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-16	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-18	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-19	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
64-21	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.49.3 Map of Repetitive Loss Area



7.50 REPETITIVE LOSS AREA NO. 65

7.50.1 FEMA-Identified Repetitive Loss Properties

Table 7-85 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-85. Repetitive Loss Properties in Repetitive Loss Area 65

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59578	<i>Addresses omitted from public version of document</i>	12/08, 2/94, 3/91, 1/88	\$97,970.33

7.50.2 Additional Properties Included in Repetitive Loss Area

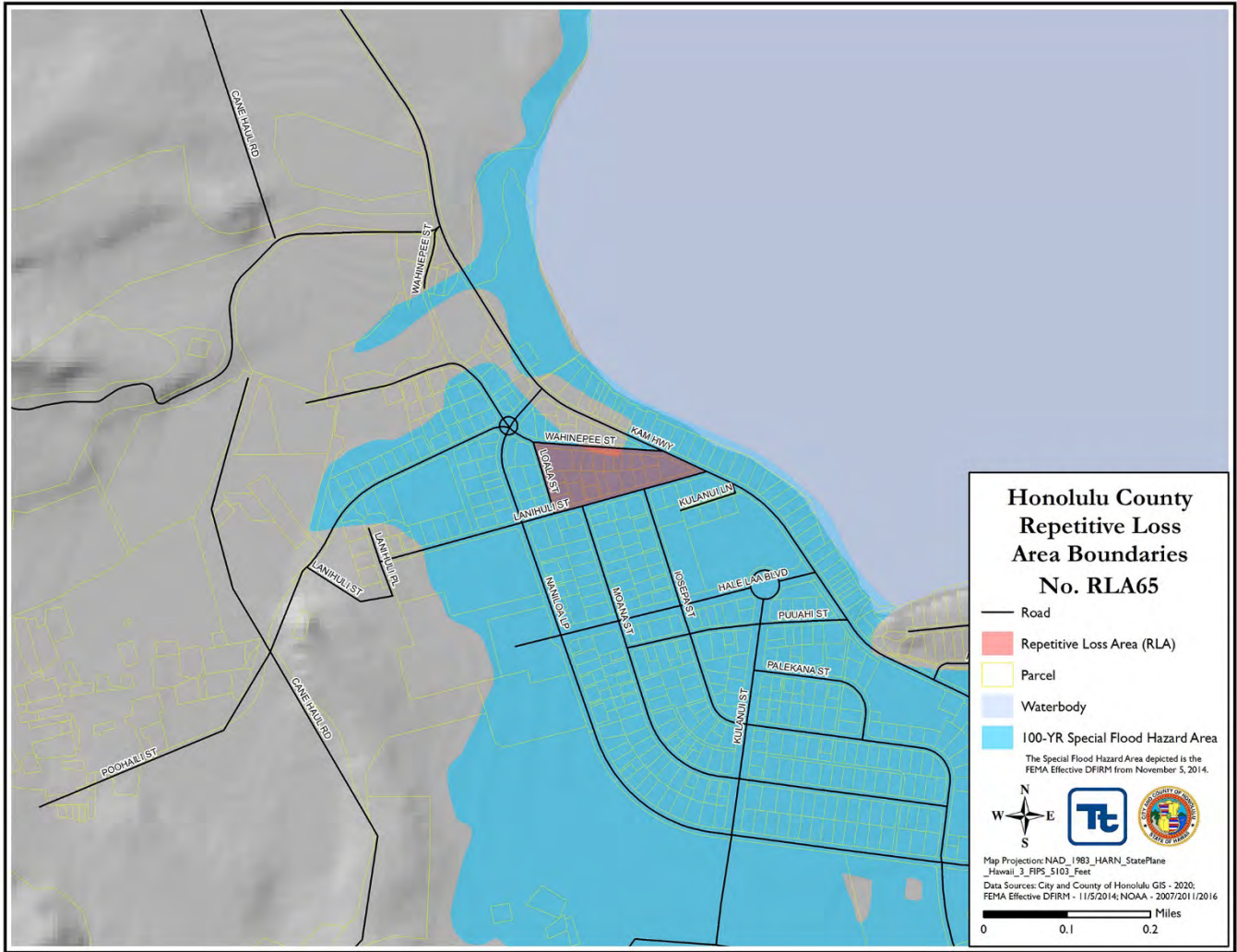
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-86 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-86. Additional Properties Included in Repetitive Loss Area 65

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
65-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-13	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
65-14	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-15	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-16	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-18	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-19	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-21	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
65-22	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.50.3 Map of Repetitive Loss Area



7.51 REPETITIVE LOSS AREA NO. 68

7.51.1 FEMA-Identified Repetitive Loss Properties

Table 7-87 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-87. Repetitive Loss Properties in Repetitive Loss Area 68

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
81743	<i>Addresses omitted from public version of document</i>	3/06, 11/96, 12/92	\$77,417.36

7.51.2 Additional Properties Included in Repetitive Loss Area

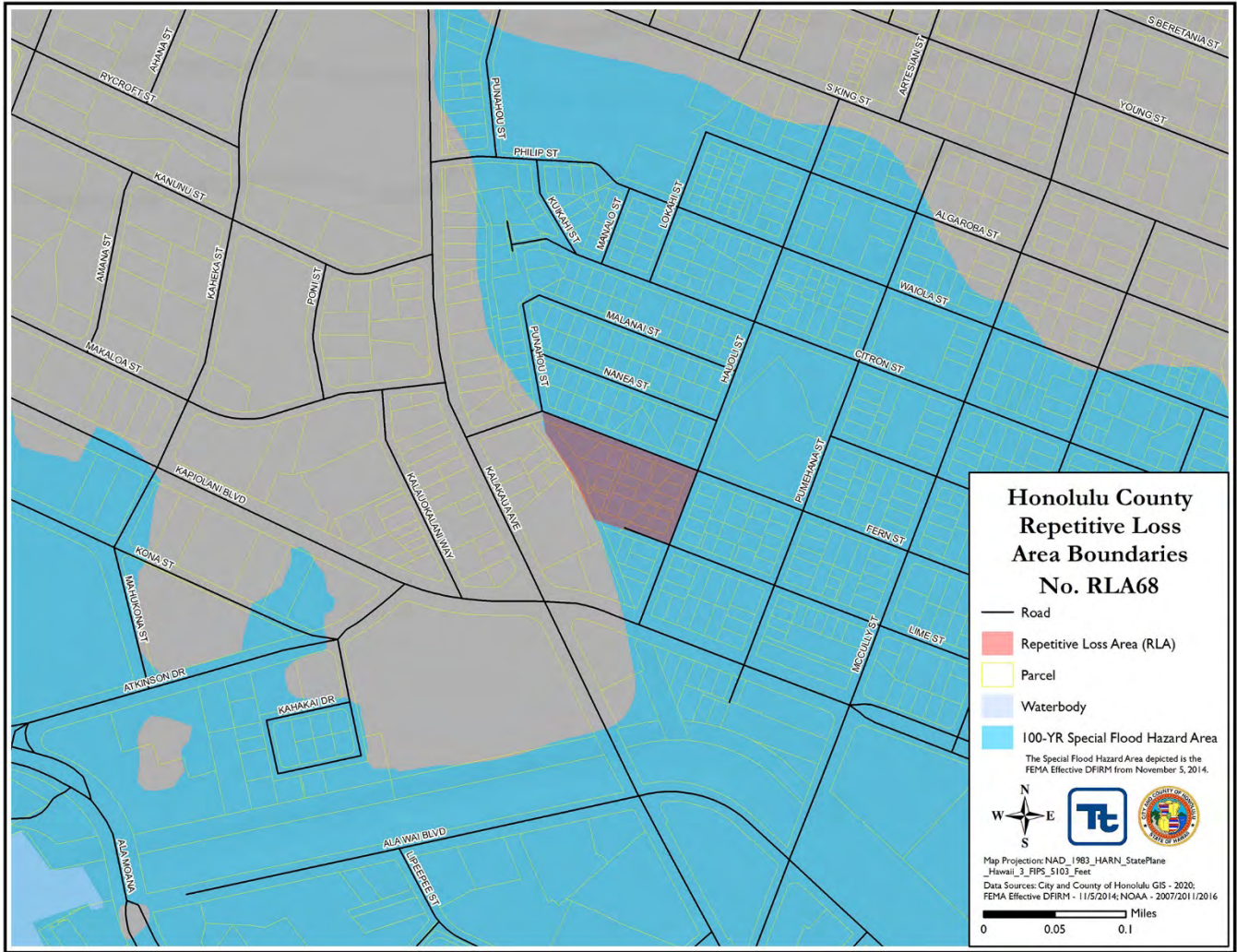
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-88 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-88. Additional Properties Included in Repetitive Loss Area 68

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
68-1	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
68-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
68-3	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
68-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-13	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
68-14	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
68-15	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
68-16	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
68-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-18	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-19	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
68-21	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.51.3 Map of Repetitive Loss Area



7.52 REPETITIVE LOSS AREA NO. 69

7.52.1 FEMA-Identified Repetitive Loss Properties

Table 7-89 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-89. Repetitive Loss Properties in Repetitive Loss Area 69

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
163744	<i>Addresses omitted from public version of document</i>	3/06, 10/04	\$5,180.95

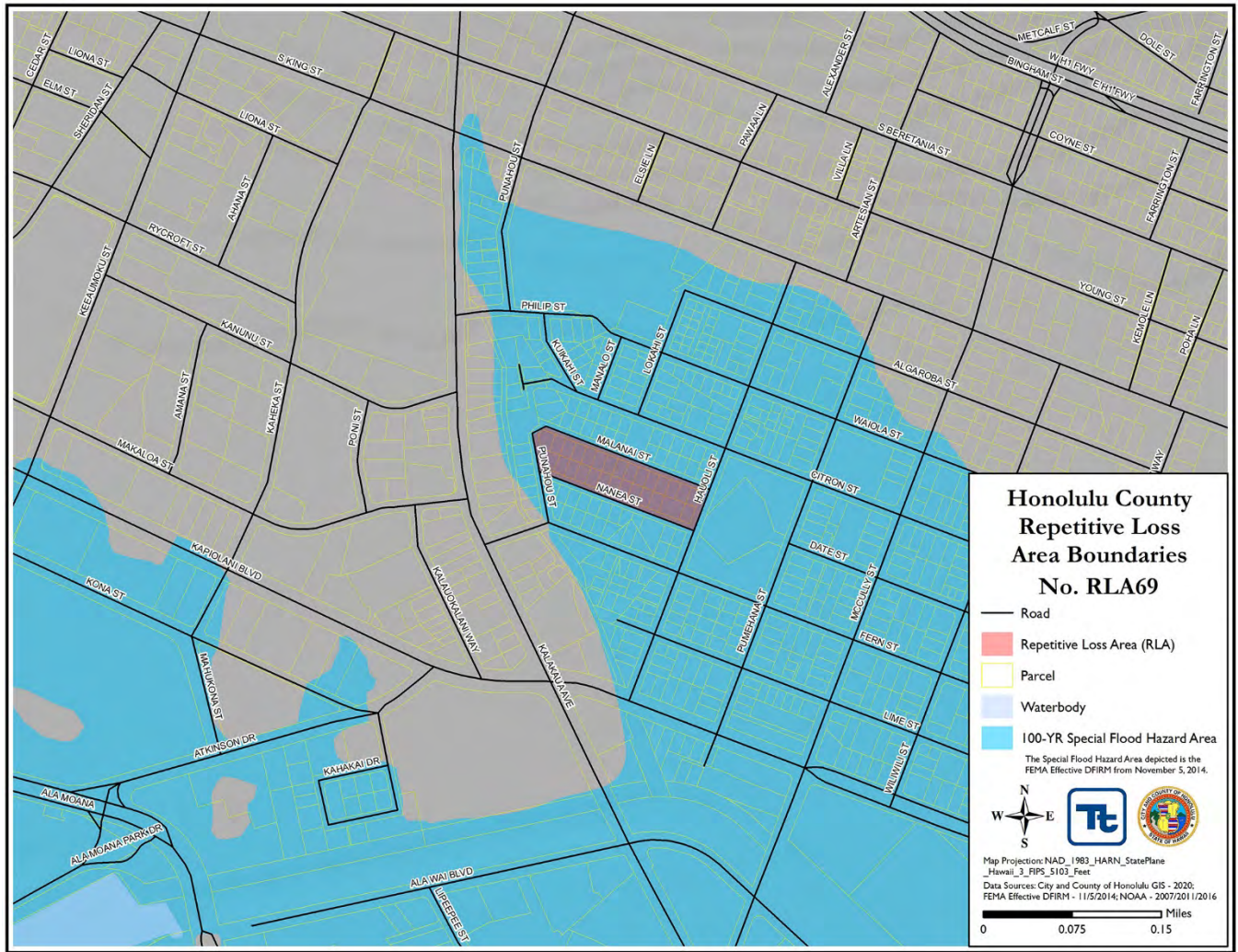
7.52.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-90 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-90. Additional Properties Included in Repetitive Loss Area 69

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
69-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
69-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.52.3 Map of Repetitive Loss Area



7.53 REPETITIVE LOSS AREA NO. 70

7.53.1 FEMA-Identified Repetitive Loss Properties

Table 7-91 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-91. Repetitive Loss Properties in Repetitive Loss Area 70

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
82286	<i>Addresses omitted from public version of document</i>	11/96, 3/91	\$184,759.76

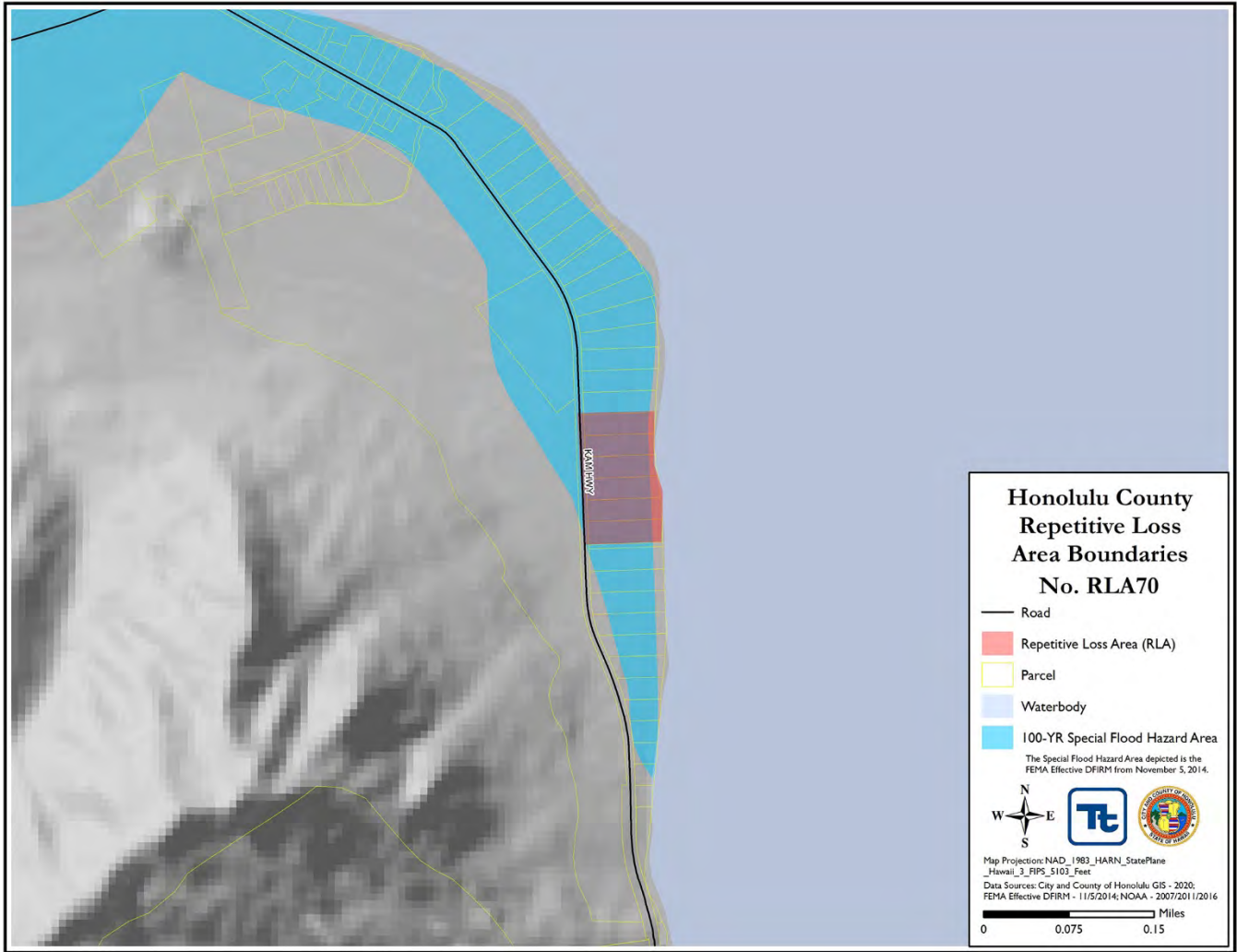
7.53.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-92 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-92. Additional Properties Included in Repetitive Loss Area 70

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
70-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.53.3 Map of Repetitive Loss Area



7.54 REPETITIVE LOSS AREA NO. 71

7.54.1 FEMA-Identified Repetitive Loss Properties

Table 7-93 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-93. Repetitive Loss Properties in Repetitive Loss Area 71

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
83273	<i>Addresses omitted from public version of document</i>	11/96, 10/91	\$11,942.40

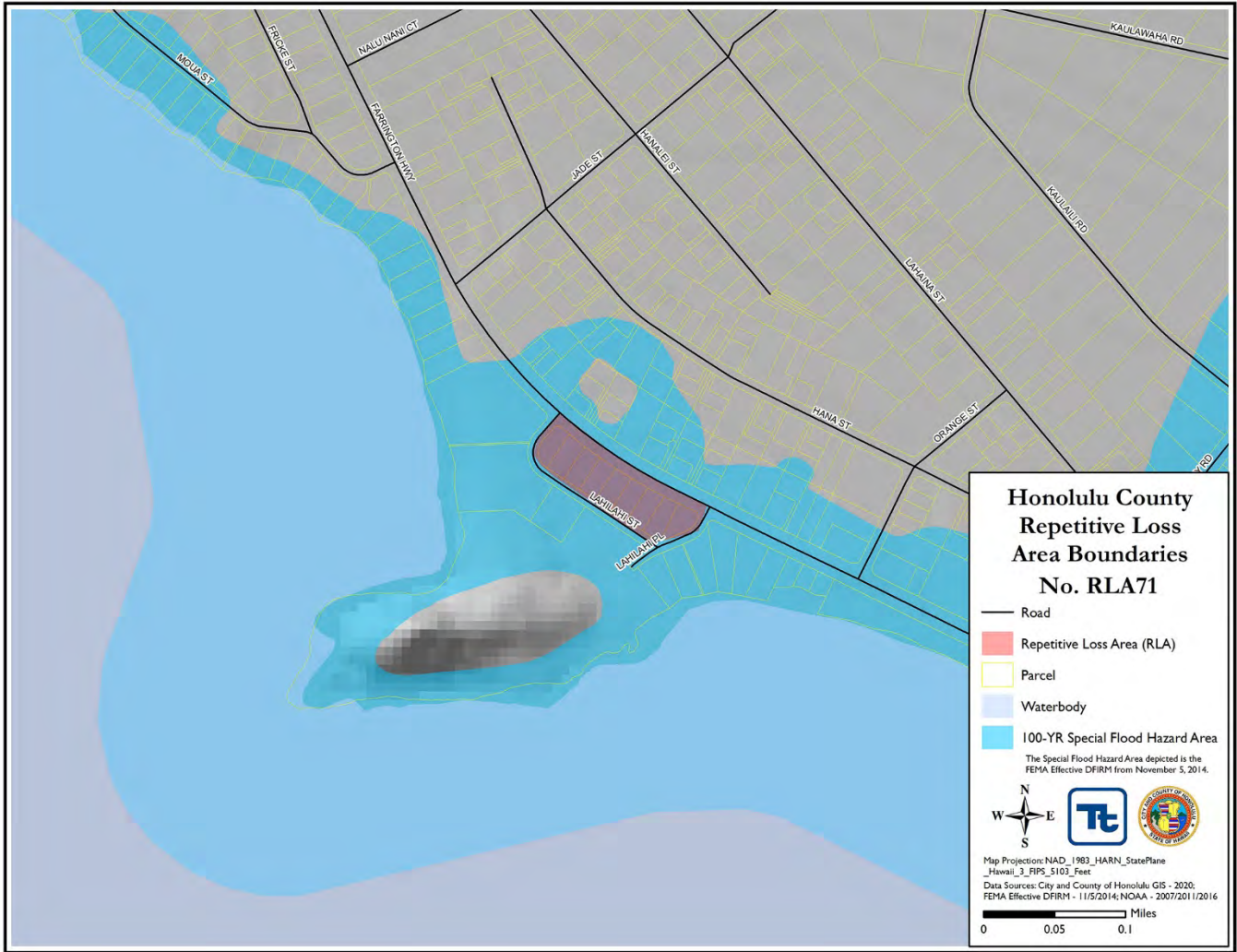
7.54.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-94 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-94. Additional Properties Included in Repetitive Loss Area 71

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
71-1	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
71-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
71-3	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
71-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
71-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.54.3 Map of Repetitive Loss Area



7.55 REPETITIVE LOSS AREA NO. 72

7.55.1 FEMA-Identified Repetitive Loss Properties

Table 7-95 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-95. Repetitive Loss Properties in Repetitive Loss Area 72

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
90445	<i>Addresses omitted from public version of document</i>	2/97, 8/93	\$27,056.77

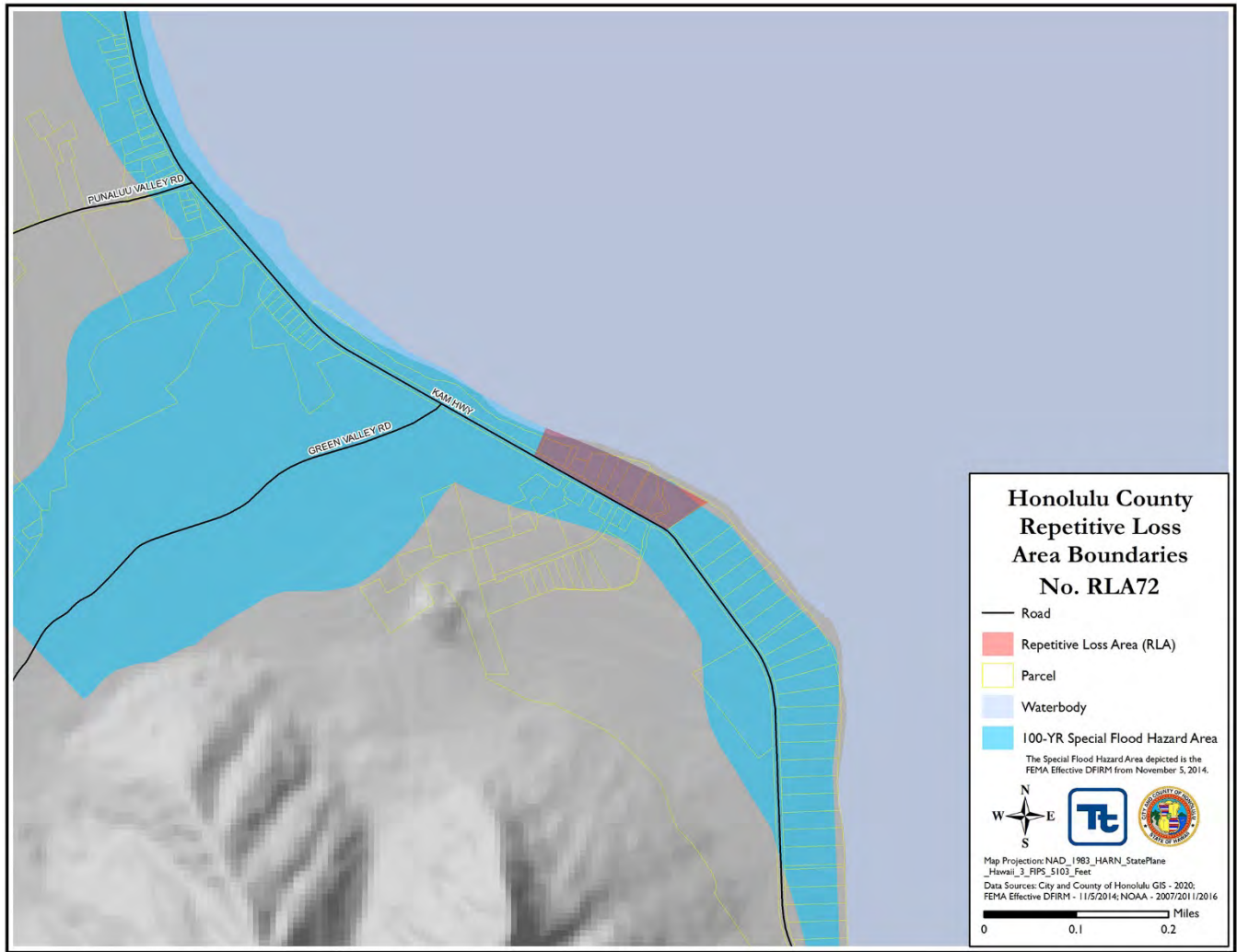
7.55.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-96 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-96. Additional Properties Included in Repetitive Loss Area 72

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
72-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
72-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
72-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
72-4	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.55.3 Map of Repetitive Loss Area



7.56 REPETITIVE LOSS AREA NO. 73

7.56.1 FEMA-Identified Repetitive Loss Properties

Table 7-97 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-97. Repetitive Loss Properties in Repetitive Loss Area 73

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
127821	<i>Addresses omitted from public version of document</i>	12/08, 3/04, 11/96	\$25,147.04

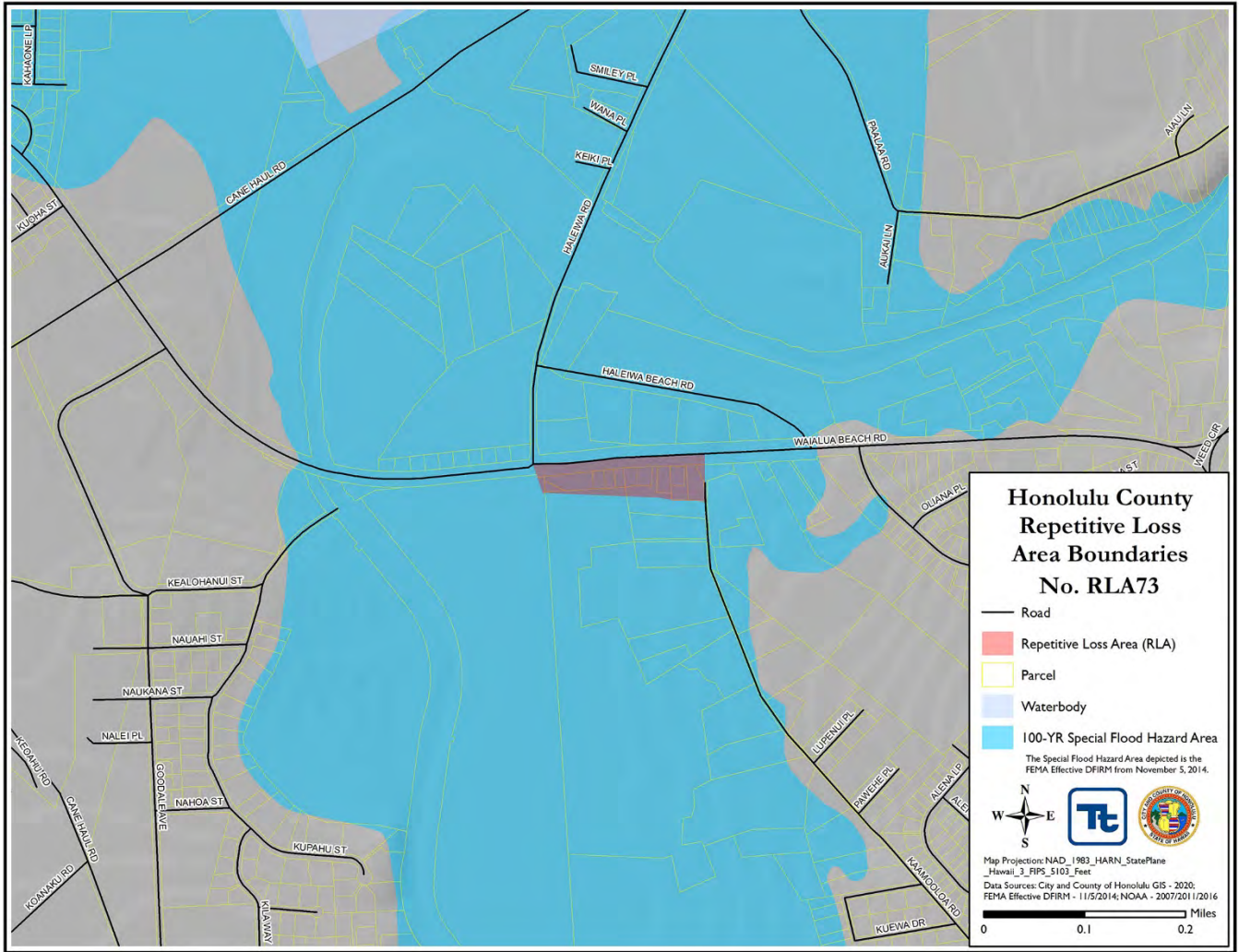
7.56.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-98 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-98. Additional Properties Included in Repetitive Loss Area 73

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
73-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
73-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
73-3	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
73-4	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
73-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.56.3 Map of Repetitive Loss Area



7.57 REPETITIVE LOSS AREA NO. 74

7.57.1 FEMA-Identified Repetitive Loss Properties

Table 7-99 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-99. Repetitive Loss Properties in Repetitive Loss Area 74

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
138898	<i>Addresses omitted from public version of document</i>	3/06, 1/05, 9/92	\$106,921.024

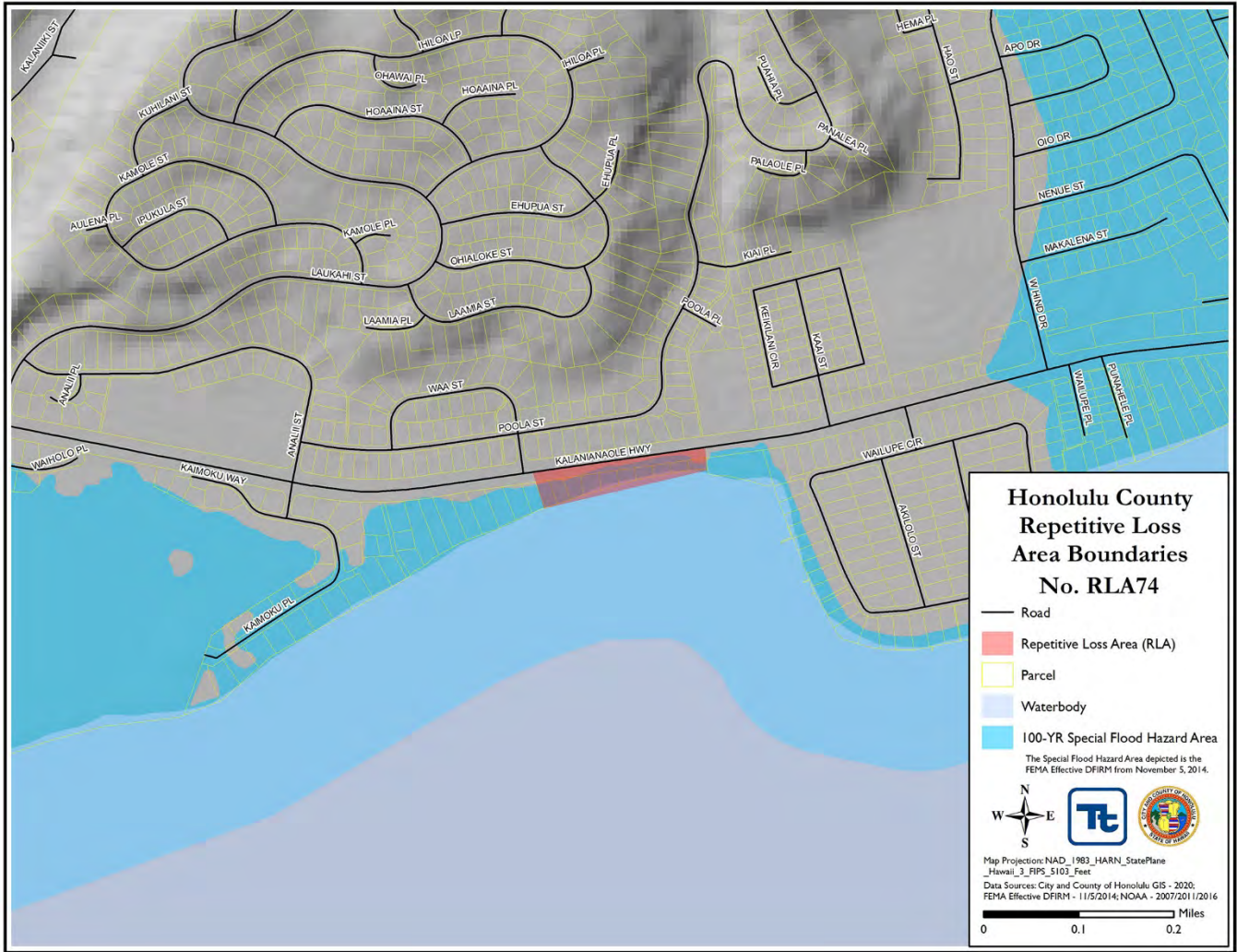
7.57.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-100 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-100. Additional Properties Included in Repetitive Loss Area 74

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
74-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
74-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.57.3 Map of Repetitive Loss Area



7.58 REPETITIVE LOSS AREA NO. 75

7.58.1 FEMA-Identified Repetitive Loss Properties

Table 7-101 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-101. Repetitive Loss Properties in Repetitive Loss Area 75

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
174279	<i>Addresses omitted from public version of document</i>	2/18, 12/08, 11/07, 3/06	\$58,324.78

7.58.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-102 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-102. Additional Properties Included in Repetitive Loss Area 75

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
75-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
75-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
75-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
75-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
75-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
75-6	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
75-7	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.58.3 Map of Repetitive Loss Area



7.59 REPETITIVE LOSS AREA NO. 76

7.59.1 FEMA-Identified Repetitive Loss Properties

Table 7-103 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-103. Repetitive Loss Properties in Repetitive Loss Area 76

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
184112	<i>Addresses omitted from public version of document</i>	12/08, 9/92	\$2,129,189.30

7.59.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.59.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

7.60 REPETITIVE LOSS AREA NO. 77

7.60.1 FEMA-Identified Repetitive Loss Properties

Table 7-104 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-104. Repetitive Loss Properties in Repetitive Loss Area 77

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
184723	<i>Addresses omitted from public version of document</i>	12/08, 9/92	\$2,129,189.30

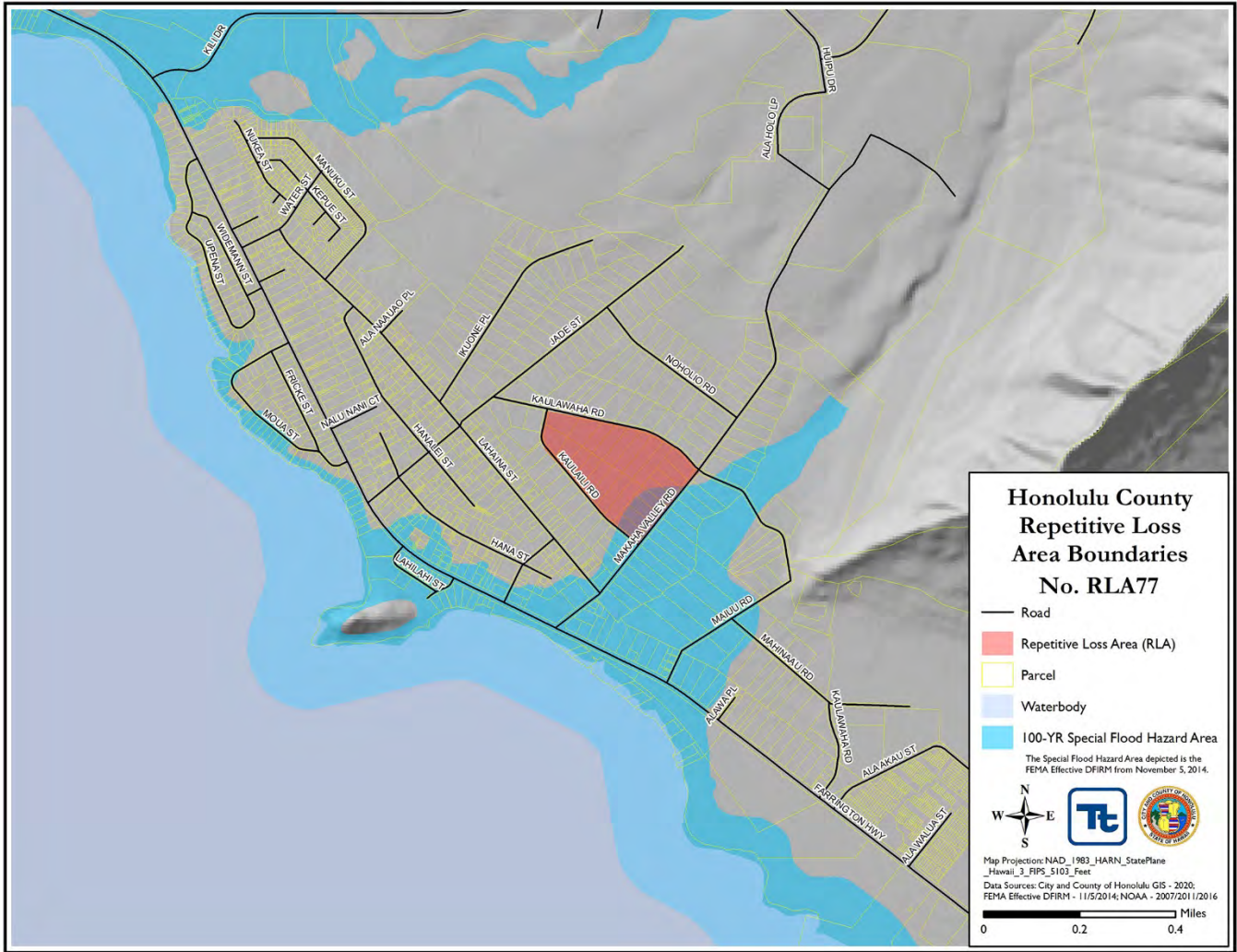
7.60.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-105 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-105. Additional Properties Included in Repetitive Loss Area 77

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
77-1	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
77-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.60.3 Map of Repetitive Loss Area



7.61 REPETITIVE LOSS AREA NO. 78

7.61.1 FEMA-Identified Repetitive Loss Properties

Table 7-106 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-106. Repetitive Loss Properties in Repetitive Loss Area 78

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
190961	<i>Addresses omitted from public version of document</i>	7/14, 11/09, 12/08	\$63,675.07

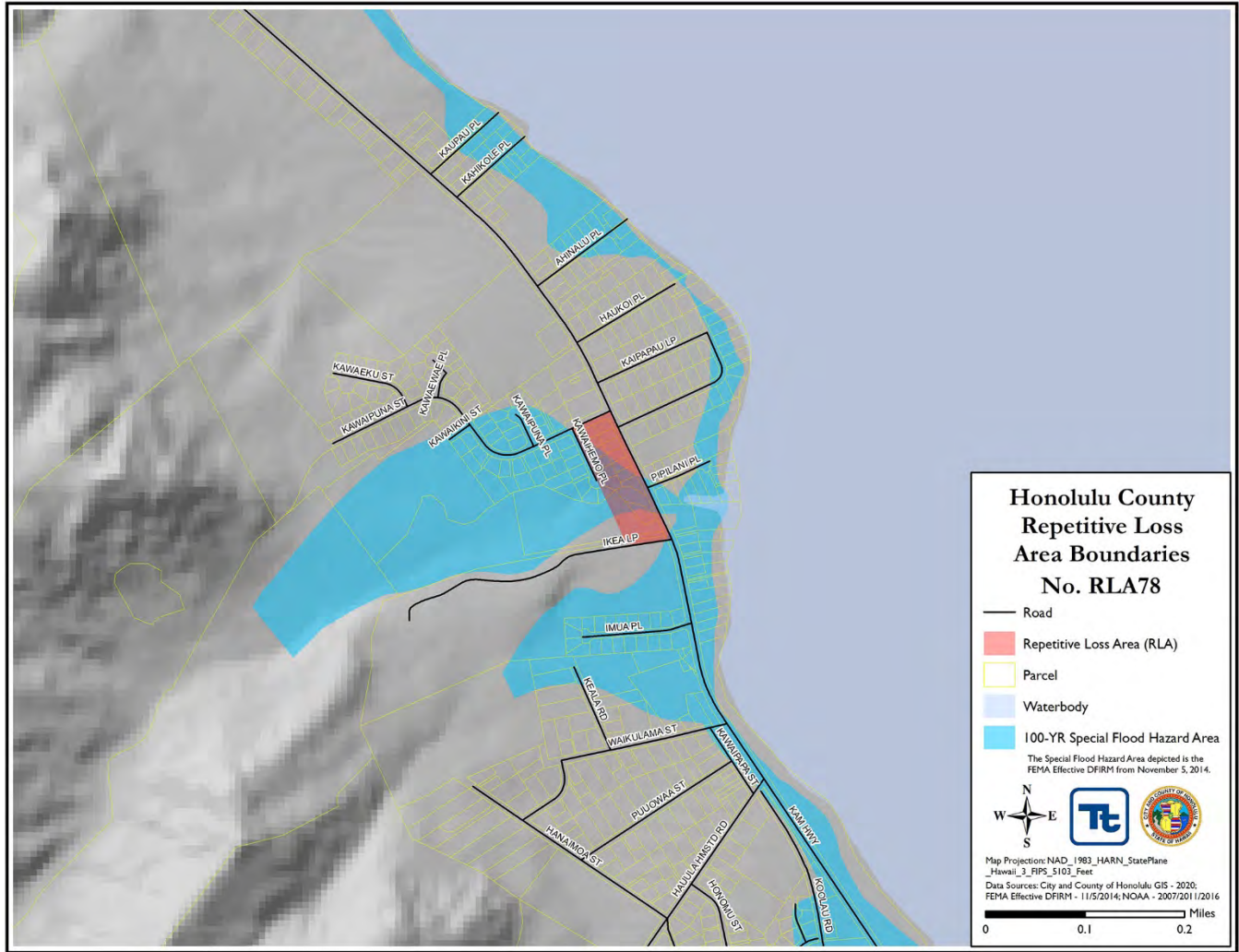
7.61.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-107 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-107. Additional Properties Included in Repetitive Loss Area 78

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
78-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Drainage Maintenance and Elevation
78-2	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Drainage Maintenance and Elevation

7.61.3 Map of Repetitive Loss Area



7.62 REPETITIVE LOSS AREA NO. 79

7.62.1 FEMA-Identified Repetitive Loss Properties

Table 7-108 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-108. Repetitive Loss Properties in Repetitive Loss Area 79

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
192072	<i>Addresses omitted from public version of document</i>	1/14, 12/13, 1/10, 1/83	\$57,858.42

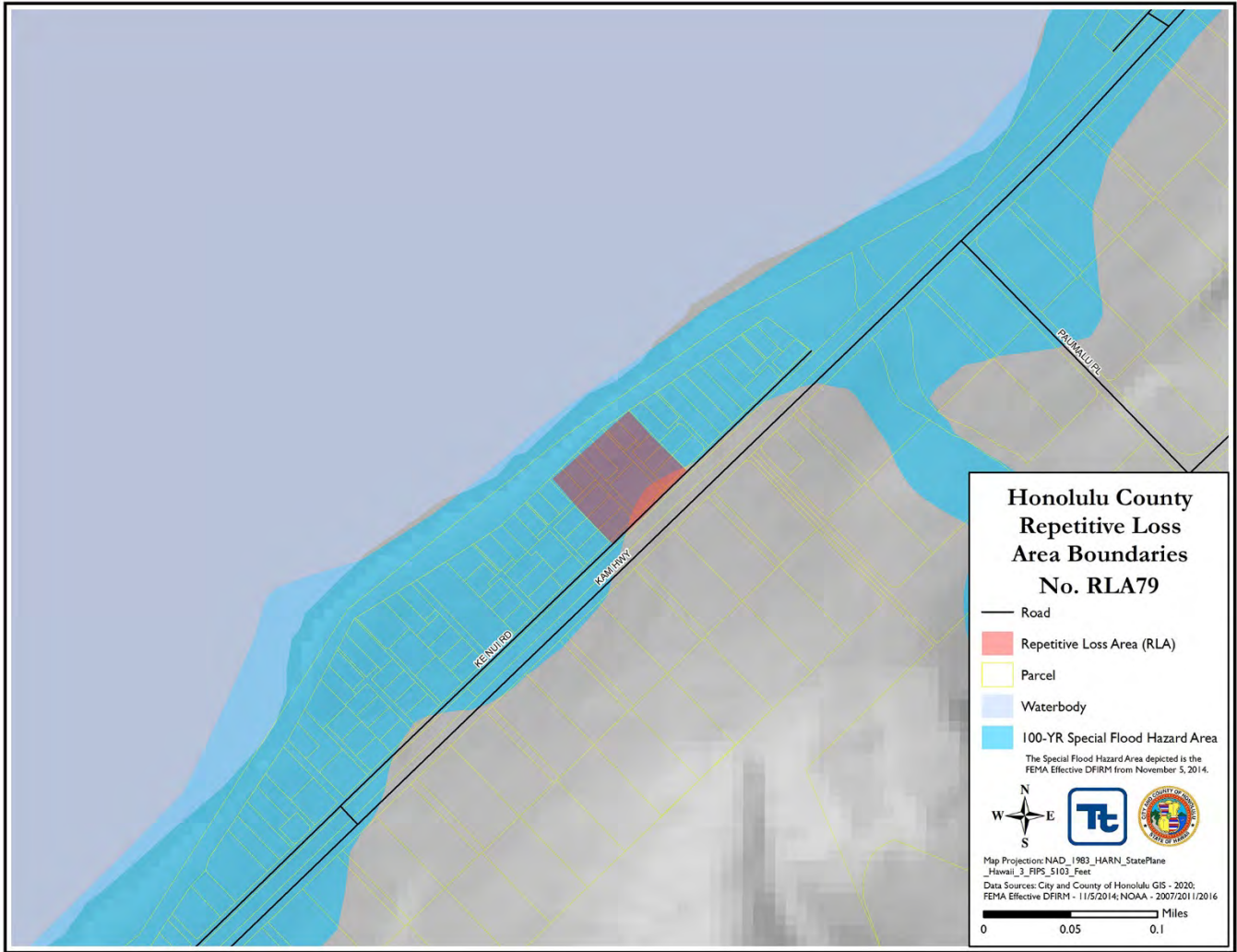
7.62.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-109 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-109. Additional Properties Included in Repetitive Loss Area 79

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
79-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
79-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
79-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
79-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
79-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.62.3 Map of Repetitive Loss Area



7.63 REPETITIVE LOSS AREA NO. 80

7.63.1 FEMA-Identified Repetitive Loss Properties

Table 7-110 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-110. Repetitive Loss Properties in Repetitive Loss Area 80

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
239982	<i>Addresses omitted from public version of document</i>	7/14, 12/08	\$46,639.59

7.63.2 Additional Properties Included in Repetitive Loss Area

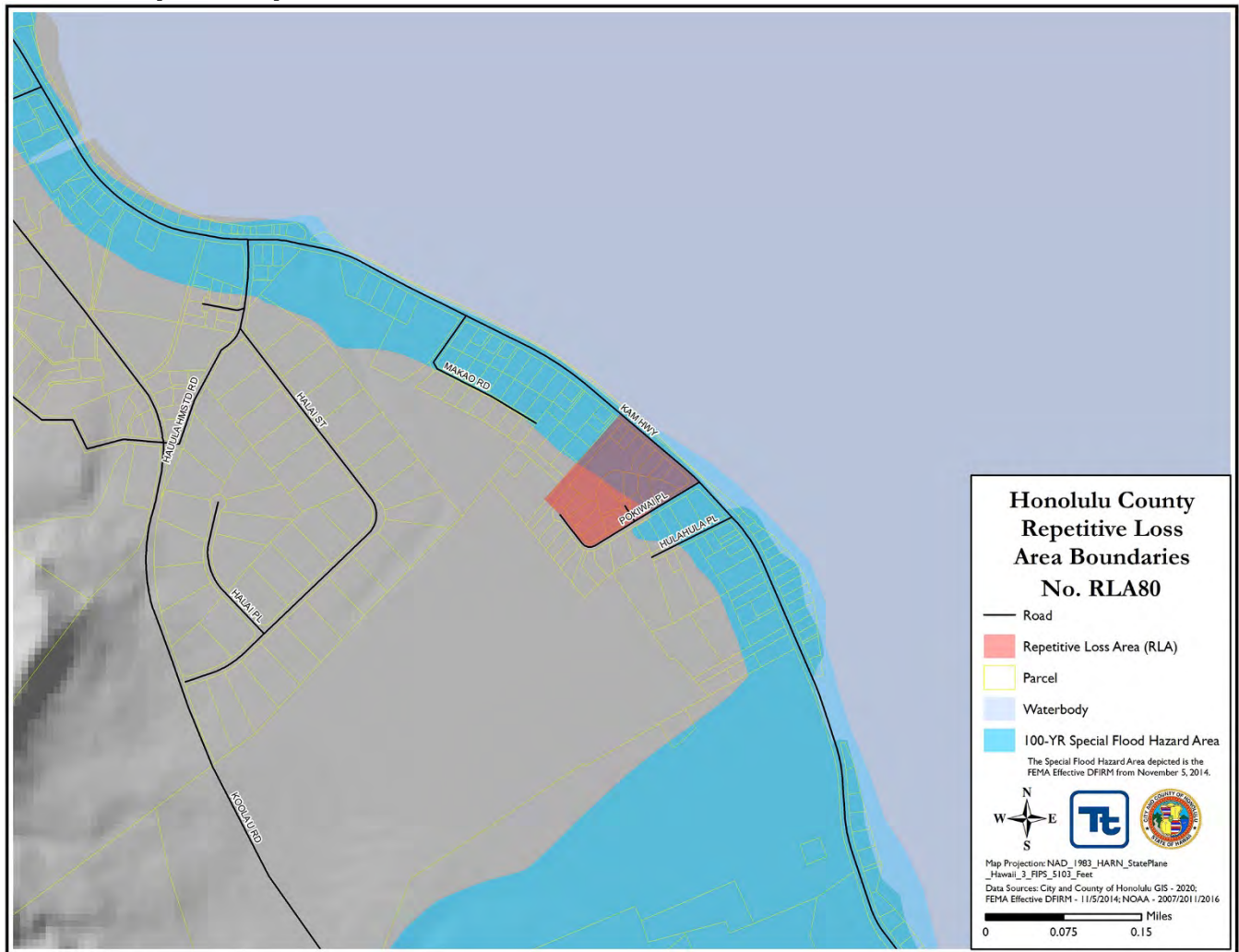
Other properties with similar conditions have been identified in this repetitive loss area. Table 7-111 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-111. Additional Properties Included in Repetitive Loss Area 80

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
80-1	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
80-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
80-3	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
80-4	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
80-5	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
80-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
80-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
80-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
80-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
80-10	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
80-11	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
80-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
80-13	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
80-14	Addresses omitted from public version of document	1	Crawlspace	Good	Elevation
80-15	Addresses omitted from public version of document	1	Crawlspace	Good	Elevation
80-16	Addresses omitted from public version of document	1	Crawlspace	Good	Elevation
80-17	Addresses omitted from public version of document	1	Crawlspace	Good	Elevation

7.63.3 Map of Repetitive Loss Area



7.64 REPETITIVE LOSS AREA NO. 82

7.64.1 FEMA-Identified Repetitive Loss Properties

Table 7-112 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-112. Repetitive Loss Properties in Repetitive Loss Area 82

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
244654	<i>Addresses omitted from public version of document</i>	8/15, 12/10	\$11,129.38
36311	<i>Addresses omitted from public version of document</i>	7/16, 3/06, 11/96, 3/94, 9/92, 12/88, 2/79	\$480,658.21

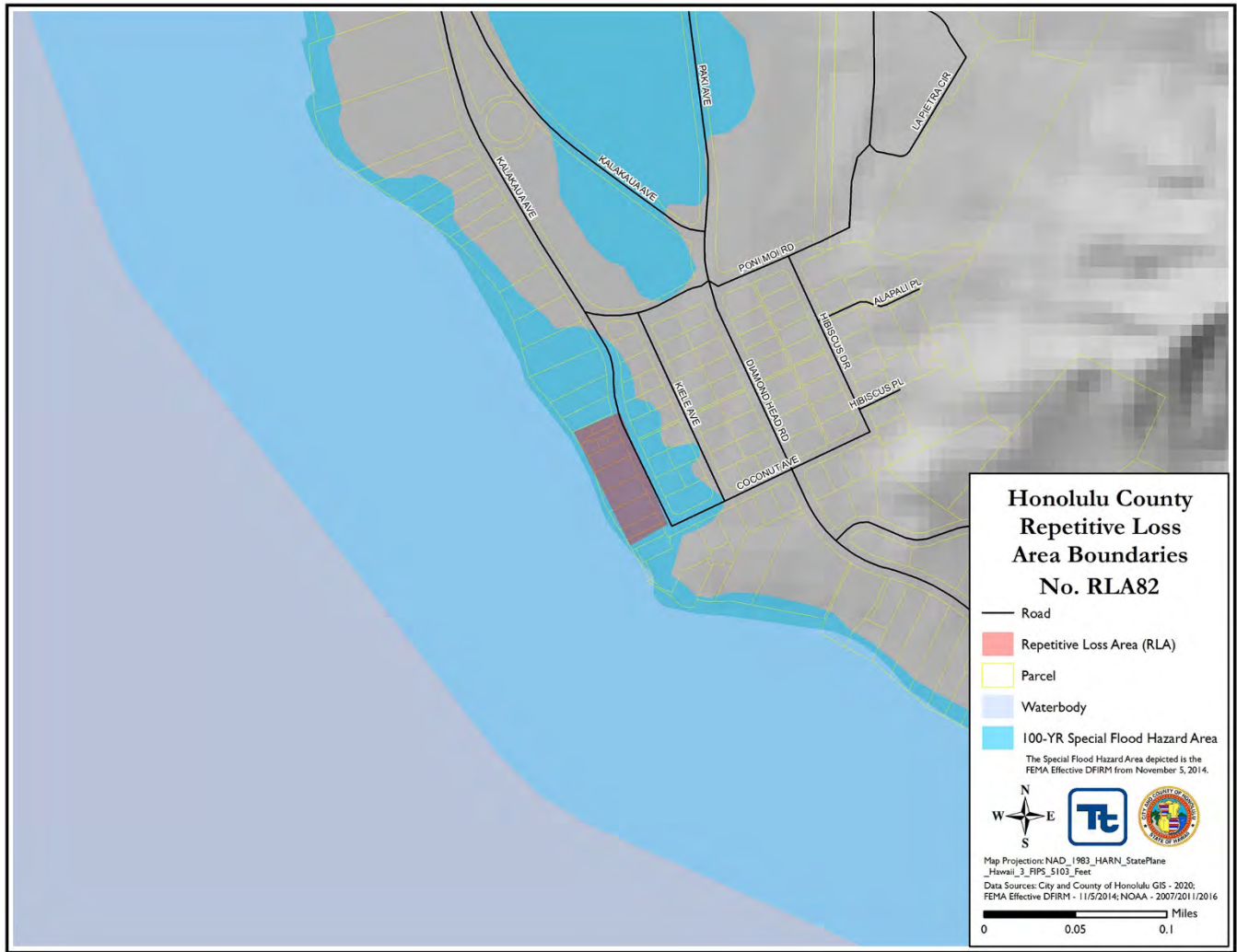
7.64.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-113 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-113. Additional Properties Included in Repetitive Loss Area 82

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
82-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
82-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
82-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
82-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
82-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
82-6	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation
82-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
82-8	<i>Addresses omitted from public version of document</i>	1	Crawlspace	Good	Elevation

7.64.3 Map of Repetitive Loss Area



7.65 REPETITIVE LOSS AREA NO. 84

7.65.1 FEMA-Identified Repetitive Loss Properties

Table 7-114 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-114. Repetitive Loss Properties in Repetitive Loss Area 84

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
276258	<i>Addresses omitted from public version of document</i>	4/18, 3/11	\$568,102.21

7.65.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 7-115 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 7-115. Additional Properties Included in Repetitive Loss Area 84

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
84-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
84-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation
84-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Elevation

7.65.3 Map of Repetitive Loss Area



7.66 REPETITIVE LOSS AREA NO. 85

7.66.1 FEMA-Identified Repetitive Loss Properties

Table 7-116 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 7-116. Repetitive Loss Properties in Repetitive Loss Area 85

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
303239	<i>Addresses omitted from public version of document</i>	12/88, 2/83	\$6,123.32

7.66.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

7.66.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

8. FLOODPROOFING (NON-RESIDENTIAL)

This RLAA review suggest floodproofing to non-residential structures. It seems unreasonable to elevate in this high densely populated and very large structure in an industrial complex. Flooding seems to be from downpours with very little percolation due to the highly populated area. Repetitive loss areas included in the floodproofing mitigation measure 16, 25, 51, 54, 66, and 83. Floodproofing will likely require manual intervention (set up flood doors etc.), including times that the structures might not be occupied, after business hours. Some of the properties in these areas are not in the FEMA-identified special flood hazard area and may not be covered by flood insurance.

Each section of this chapter describes one repetitive loss area, including a list of repetitive loss properties (referenced by the FEMA RL identifier), a description of additional properties in the area (if any were identified), and a map of the repetitive loss area. Maps are not included for single-property repetitive loss areas due to privacy concerns.

8.1 REPETITIVE LOSS AREA NO. 16

8.1.1 FEMA-Identified Repetitive Loss Properties

Table 8-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 8-1. Repetitive Loss Properties in Repetitive Loss Area 16

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
76925	<i>Addresses omitted from public version of document</i>	2/95, 9/92, 9/86	\$44,500.75
89962	<i>Addresses omitted from public version of document</i>	6/19, 8/17, 7/16, 2/04, 3/04, 6/01, 11/96, 2/95	\$1,058,713.60
59551	<i>Addresses omitted from public version of document</i>	12/87, 10/85	\$3,563.47

8.1.2 Additional Properties Included in Repetitive Loss Area

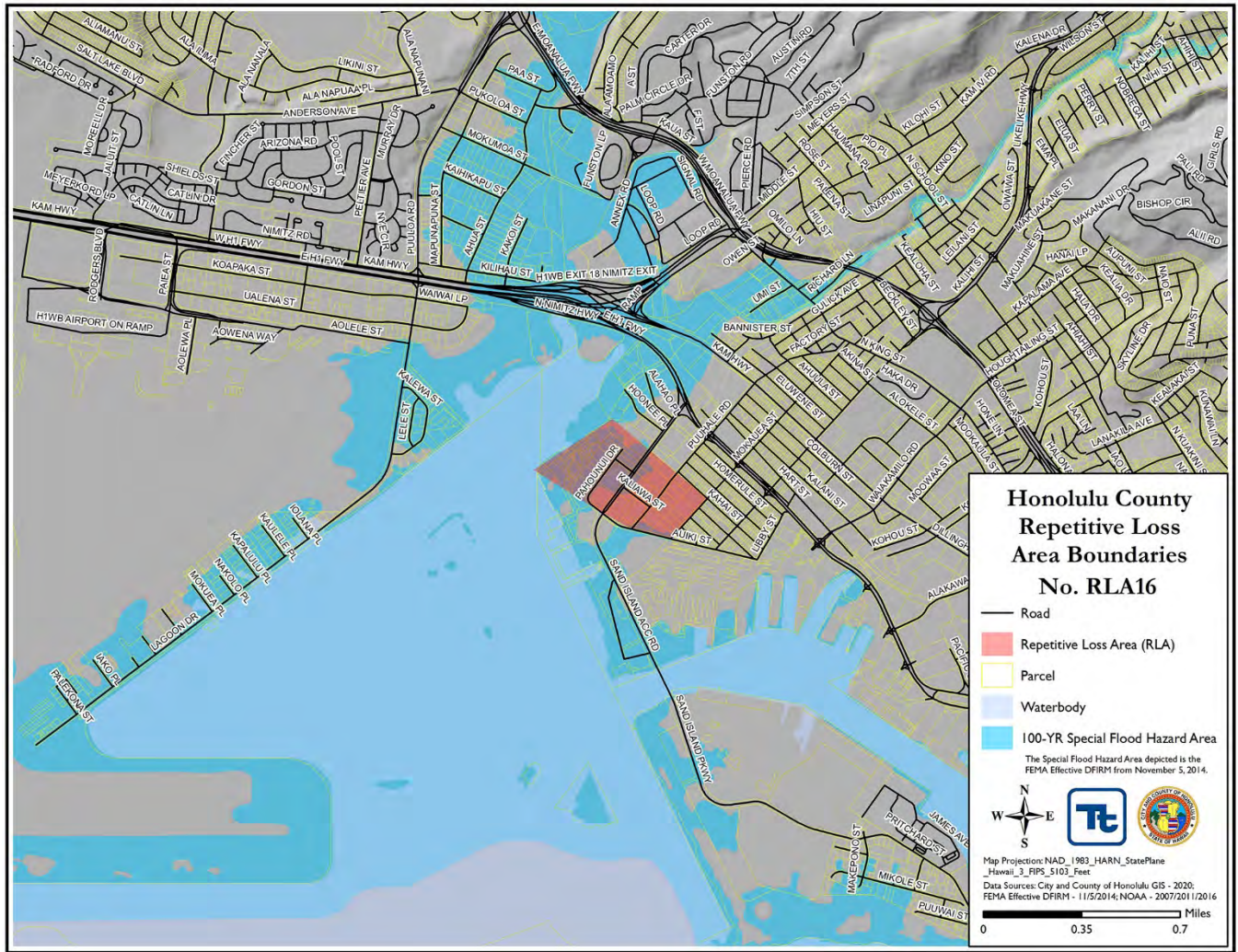
Other properties with similar conditions have been identified in this repetitive loss area. Table 8-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 8-2. Additional Properties Included in Repetitive Loss Area 16

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
16-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-9	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-10	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-11	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
16-12	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-13	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-14	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-15	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-16	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-17	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-18	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-19	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-20	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-21	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-22	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-23	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-24	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-25	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-26	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
16-27	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing

8.1.3 Map of Repetitive Loss Area



8.2 REPETITIVE LOSS AREA NO. 25

8.2.1 FEMA-Identified Repetitive Loss Properties

Table 8-3 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 8-3. Repetitive Loss Properties in Repetitive Loss Area 25

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
59546	<i>Addresses omitted from public version of document</i>	5/11, 10/92, 11/82	\$22,176.75

8.2.2 Additional Properties Included in Repetitive Loss Area

No other properties with similar conditions have been identified in this repetitive loss area.

8.2.3 Map of Repetitive Loss Area

Maps are not included for single-property repetitive loss areas due to privacy concerns.

8.3 REPETITIVE LOSS AREA NO. 51

8.3.1 FEMA-Identified Repetitive Loss Properties

Table 8-4 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 8-4. Repetitive Loss Properties in Repetitive Loss Area 51

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
14317	<i>Addresses omitted from public version of document</i>	11/00, 11/96, 2/95, 3/91, 12/90, 10/85, 2/85, 10/82, 3/80	\$207,365.34
15260	<i>Addresses omitted from public version of document</i>	6/80, 1/80	\$12,678.46

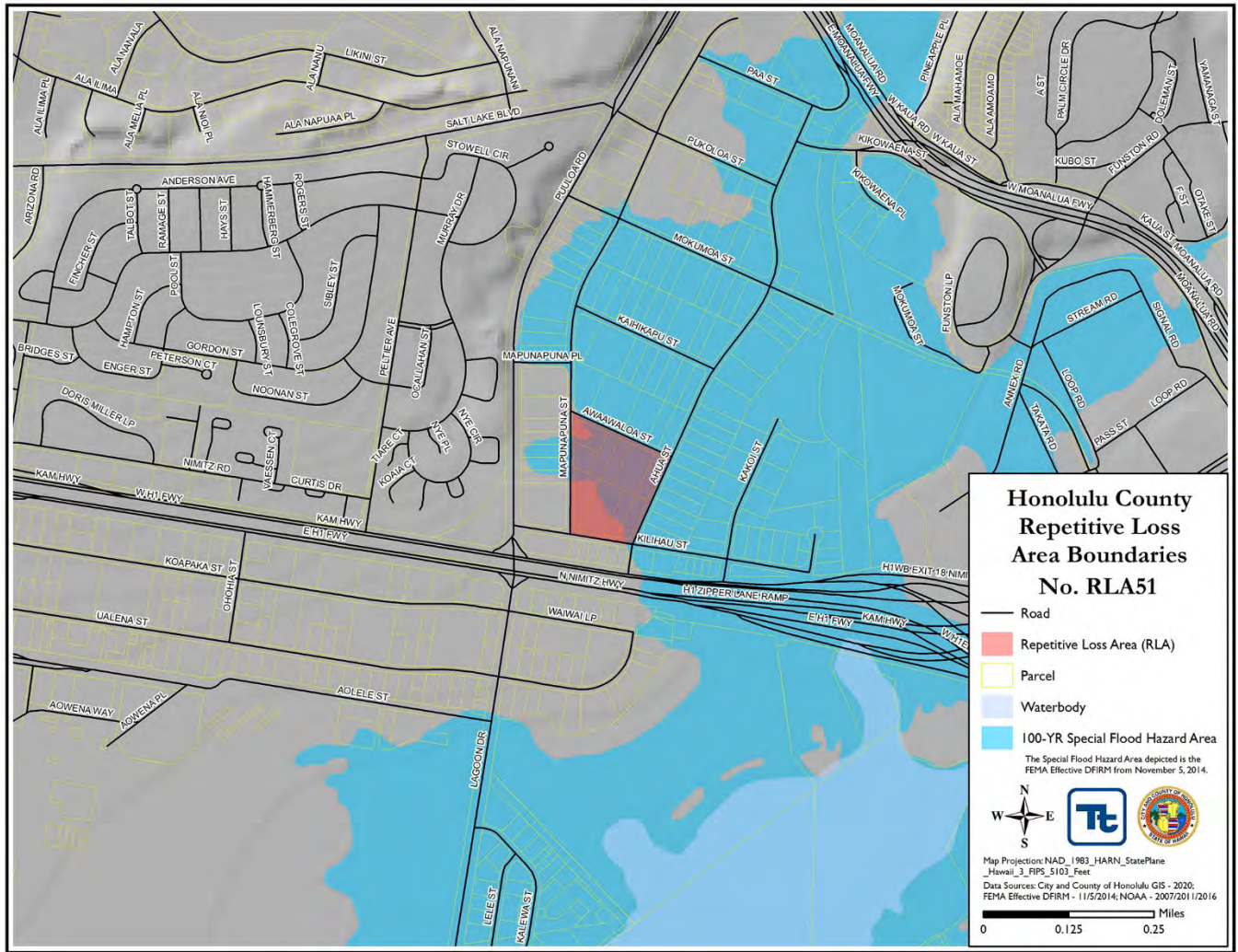
8.3.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 8-5 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 8-5. Additional Properties Included in Repetitive Loss Area 51

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
51-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
51-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
51-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
51-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing

8.3.3 Map of Repetitive Loss Area



8.4 REPETITIVE LOSS AREA NO. 54

8.4.1 FEMA-Identified Repetitive Loss Properties

Table 8-6 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 8-6. Repetitive Loss Properties in Repetitive Loss Area 54

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
41778	<i>Addresses omitted from public version of document</i>	12/90, 8/82, 1/81	\$44,798.65
31475	<i>Addresses omitted from public version of document</i>	8/82, 3/80	\$104,757.18

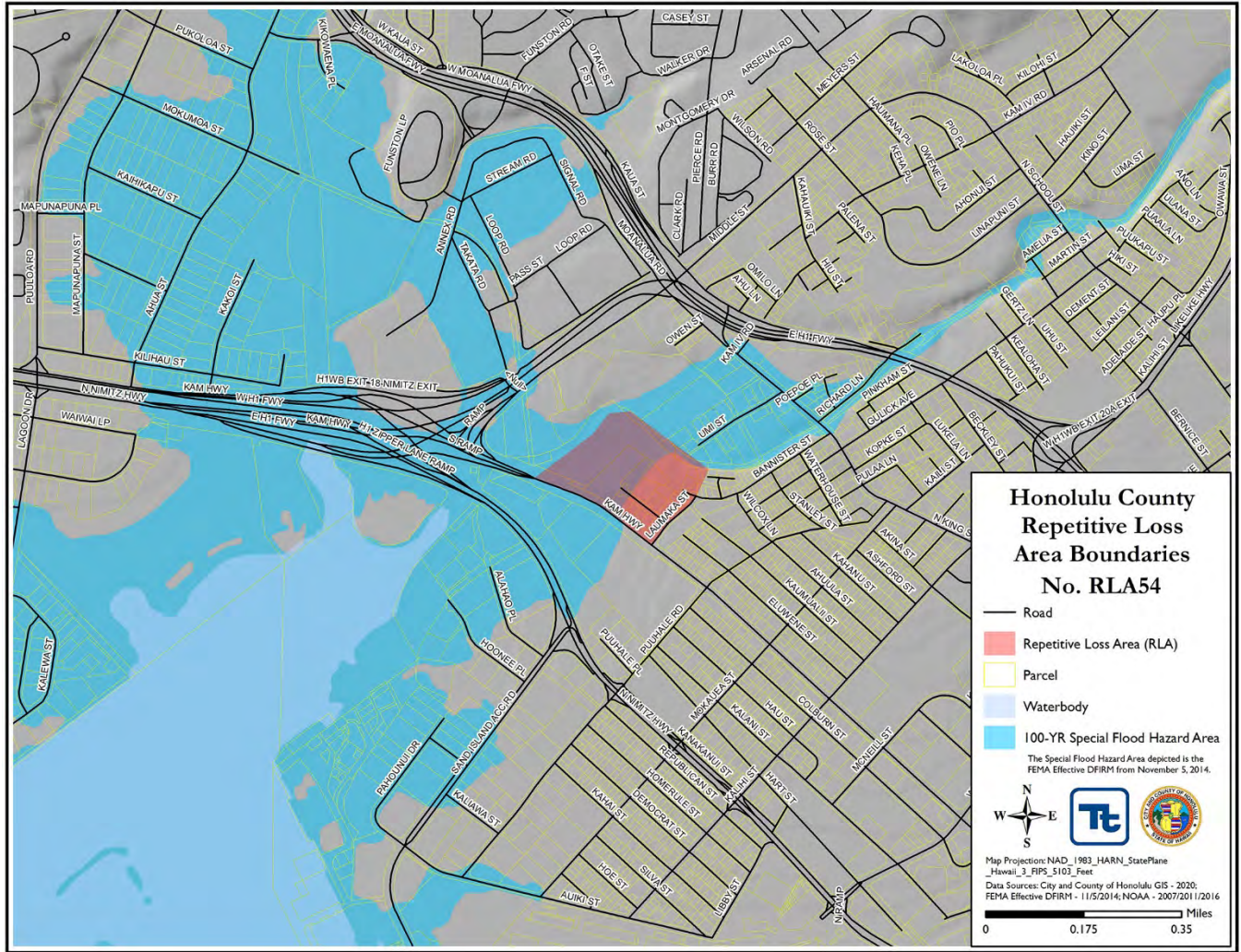
8.4.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 8-7 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 8-7. Additional Properties Included in Repetitive Loss Area 54

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
54-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
54-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
54-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
54-4	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
54-5	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
54-6	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
54-7	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
54-8	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing

8.4.3 Map of Repetitive Loss Area



8.5 REPETITIVE LOSS AREA NO. 66

8.5.1 FEMA-Identified Repetitive Loss Properties

Table 8-8 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

Table 8-8. Repetitive Loss Properties in Repetitive Loss Area 66

FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
71411	<i>Addresses omitted from public version of document</i>	8,15, 3/06, 3/94, 10/92	\$272,852.53

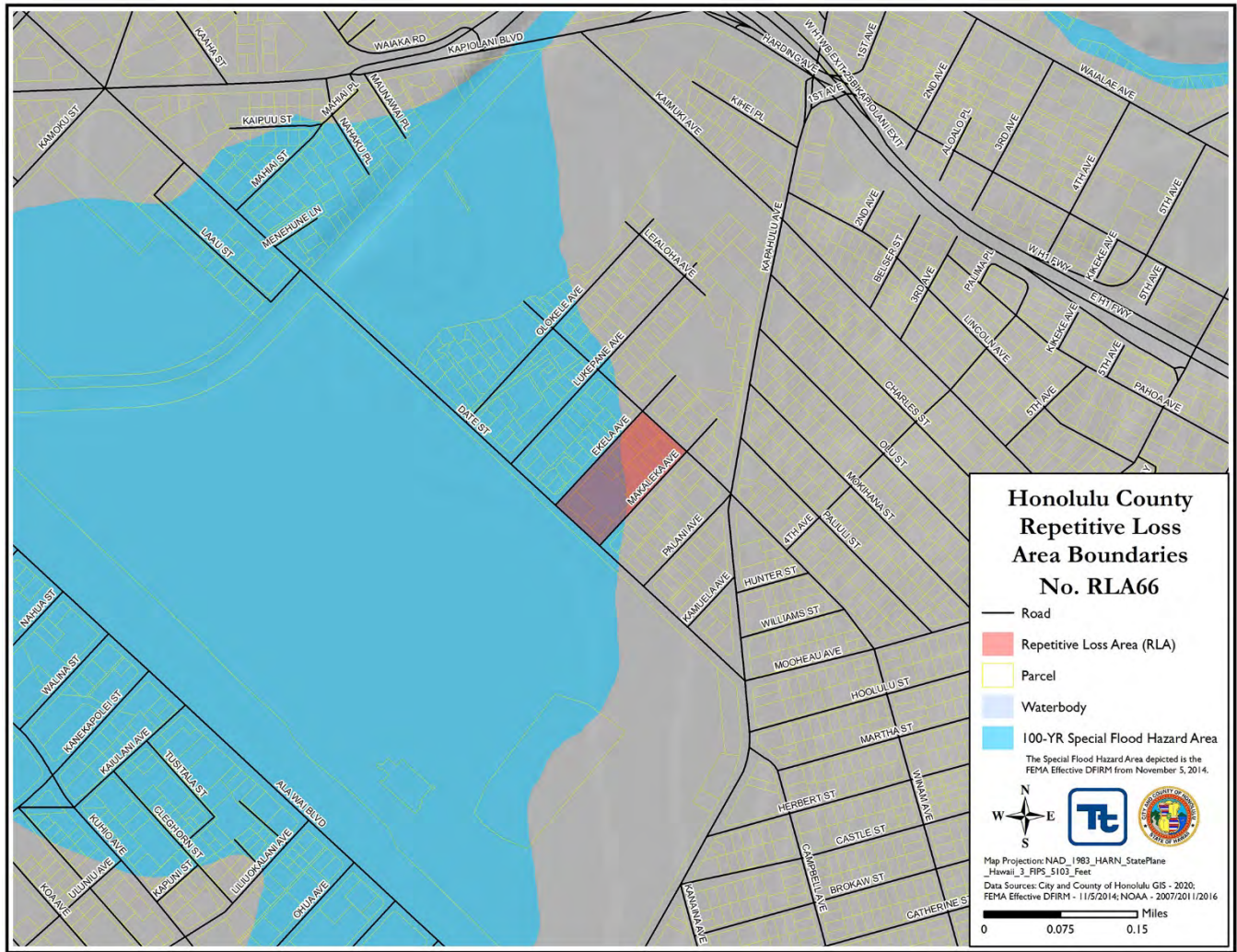
8.5.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 8-9 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 8-9. Additional Properties Included in Repetitive Loss Area 66

Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
66-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
66-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing

8.5.3 Map of Repetitive Loss Area



8.6 REPETITIVE LOSS AREA NO. 83

8.6.1 FEMA-Identified Repetitive Loss Properties

Table 8-10 lists the FEMA-designated repetitive loss properties within this repetitive loss area.

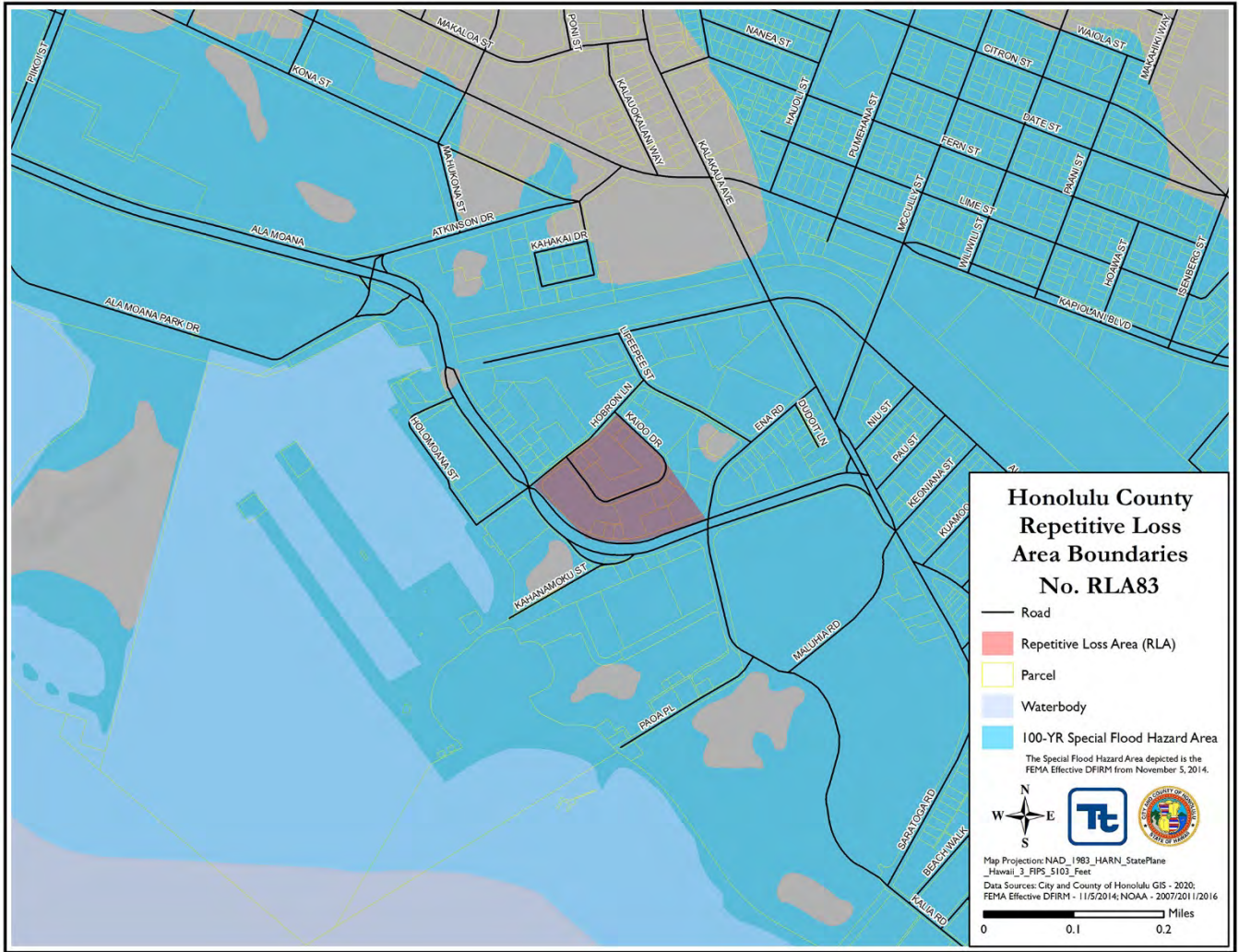
Table 8-10. Repetitive Loss Properties in Repetitive Loss Area 83			
FEMA RL #	Address	Flood Dates of Previous Claims	Total Claim(s) Paid
246186	<i>Addresses omitted from public version of document</i>	8,15, 5/11, 9/92, 2/79	\$414,568.32

8.6.2 Additional Properties Included in Repetitive Loss Area

Other properties with similar conditions have been identified in this repetitive loss area. Table 8-11 provides general information for the property, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 8-11. Additional Properties Included in Repetitive Loss Area 83					
Property ID	Address	# of Insurable Buildings	Building Description		Probable Mitigation Measures
			Foundation	Condition	
83-1	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
83-2	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing
83-3	<i>Addresses omitted from public version of document</i>	1	Slab	Good	Floodproofing

8.6.3 Map of Repetitive Loss Area



PART 3—REPETITIVE LOSS AREA ACTION PLAN

9. REPETITIVE LOSS AREA ANALYSIS

9.1 MITIGATION ACTIONS

This *City & County of Honolulu Repetitive Loss Area Analysis* was created in accordance to the prerequisites for CRS participation. Mitigation Actions reviewed fall in the following categories:

- Preventive
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information

Each repetitive loss property and similar property deemed to be adjacent, was evaluated by the above six (6) actions. The decision that best fit the individual situation and was most feasible:

- Drainage Maintenance and/or,
- Elevation,
- Floodproofing (non-residential)

9.2 ANNUAL EVALUATION REPORT

The City & County of Honolulu will prepare an annual evaluation report for its area analyses. The report will include a review of each action item, including a description of what was implemented or not implemented, and recommended changes to the actions items as appropriate. The report will be made available to the media and the public and will be submitted with the annual CRS recertification.

10. PLAN ADOPTION

The Honolulu governing board formally adopted the *City & County of Honolulu Repetitive Loss Area Analysis* on **DATE – provided by Community**. A copy of the resolution is provided in Appendix D.

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TERMINOLOGY

ACRONYMS

CFR—Code of Federal Regulations

CRS—Community Rating System

ESA—Endangered Species Act

FEMA—Federal Emergency Management Agency

FIRM—Flood Insurance Rate Map

GIS—Geographic Information System

Hazus—MH—Hazards, United States-Multi Hazard

NFIP—National Flood Insurance Program

NIMS—National Incident Management System

RL—repetitive loss

RLAA—repetitive loss area analysis

DEFINITIONS

100-Year Flood: The flood that has a 1 percent chance of being equaled or exceeded in any given year. The 100-year flood does not necessarily occur once every 100 years. It is possible for a 100-year flood to occur more than once in a relatively short period of time.

Base Flood: Another term for the 100-year flood—the flood having a 1 percent chance of being equaled or exceeded in any given year. The base flood is used as a reference flood level to ensure that all properties subject to the National Flood Insurance Program are protected to the same degree against flooding.

Benefit-Cost Analysis: A systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness. For the purposes of benefit-cost analysis of proposed mitigation actions, benefits are limited to specific, measurable, risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

Community Rating System (CRS): A voluntary program that provides flood insurance premium discounts to property owners in communities that exceed the minimum requirements of the National Flood Insurance Program and complete activities that reduce flood hazard risk.

Drainage Basin: A basin is the area within which all surface water—whether from rainfall, snowmelt, springs or other sources—flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Drainage basins are also referred to as **watersheds** or **basins**.

Exposure: The number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

Flash Flood: A flood that occurs with little or no warning when water levels rise at an extremely fast rate.

Flood Insurance Rate Map (FIRM): The official map on which the Federal Emergency Management Agency delineates special flood hazard area for a given location.

Flood Insurance Study: A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's Flood Insurance Rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A flood insurance rate map identifies most, but not necessarily all, of a community's floodplain as the special flood hazard area.

Goal: A general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve. The success of a floodplain management plan is measured by the degree to which its goals have been met (that is, by the benefits in terms of actual floodplain management).

Geographic Information System (GIS): A computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

Hazard: A source of potential danger or adverse condition that could harm people and/or cause property damage.

Hazard Mitigation Grant Program: A FEMA program that provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster

Hazards U.S. Multi-Hazard (Hazus) Loss Estimation Program: A GIS-based program used to support the development of risk assessments. The Hazus software program assesses risk in a quantitative manner to estimate damage and losses associated with natural hazards. Hazus is FEMA's nationally applicable, standardized methodology and software program and contains modules for estimating potential losses from earthquakes, floods, and wind hazards.

Inventory: A list of assets identified in a study region that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments, regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Mitigation: A preventive action that can be taken in advance of an event that will reduce or eliminate risk to life or property.

Mitigation Actions: Mitigation actions are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

Objective: A short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Preparedness: Actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Repetitive Loss Property: Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of \$1000.00; or
- Two paid flood losses in excess of \$1000.00 within any 10-year period since 1978 or
- Three or more paid losses that equal or exceed the current value of the insured property.

Risk: The estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment: The process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. This area is mapped as a Zone A in river situations and zone V in coastal situations. It may or may not encompass all of a community's flood problems

Stakeholder: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact floodplain management.

Vulnerability: An asset's susceptibility to damage during a hazard event. Vulnerability depends on an asset's construction, contents, and the economic value of its functions.

Watershed: An area that drains down-gradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

Zoning Ordinance: An ordinance that designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

City and County of Honolulu 2021 Repetitive Loss Area Analysis

Appendix A. Generic Depth-Damage Relationships for Residential Structures

MEMORANDUM FOR: *SEE DISTRIBUTION*

SUBJECT: Economic Guidance Memorandum (EGM) 04-01, Generic Depth-Damage Relationships for Residential Structures with Basements.

1. Purpose. The purpose of this memorandum is to release, and provide guidance for the use of, generic depth-damage curves for use in U.S. Army Corps of Engineers flood damage reduction studies.

2. Background. Proper planning and evaluation of flood damage reduction projects require knowledge of actual damage caused to various types of properties. The primary purpose of the Flood Damage Data Collection Program is to meet that requirement by providing Corps district offices with standardized relationships for estimating flood damage and other costs of flooding, based on actual losses from flood events. Under this program, data have been collected from major flooding that occurred in various parts of the United States from 1996 through 2001. Damage data collected are based on comprehensive accounting of losses from flood victims' records. The generic functions developed and provided in this EGM represent a substantive improvement over other generalized depth-damage functions such as the Flood Insurance Administration (FIA) Rate Reviews.

3. Results. Generic damage functions are attached for one-story homes with basement, two or more story homes with basement, and split-level homes with basement. Generic damage functions for similar structures without basements were published in 2000 and are included as enclosure 1 for ready reference.

a. Regression analysis was used to create the damage functions. While several independent variables, such as flood duration and flood warning lead-time, were examined in building the models, the models that were most efficient in explaining the percent damage to structure and contents were quadratic and cubic forms with depth as the only independent variable.

b. Content damage was modeled with the dependent variable being content damage as a percentage of structure value. This differs from the previous technique of first developing content valuations and then content damage relationships as a function of content valuations. The generic content damage models are statistically significant and their use eliminates the need to establish content-to-structure ratios through surveys.

c. While the data collected include information on all aspects of National Economic Development (NED) losses, only results and recommendations related to the structure and content damages for homes with basements are included in this EGM.

Direct costs for cleanup expenses, unpaid hours for cleanup and repair, emergency damage prevention actions, and other flood-related costs are not included in these damage functions. Information on other residential flood costs, beyond those included in these damage functions will be found in the summary report, discussed in paragraph 5. These costs should be developed using site-specific historical information.

4. Application. The following paragraphs provide information on the application of the generic curves within the HEC-FDA damage calculation program.

a. The economic section of HEC-FDA divides the quantification of flood damages into a direct method and an indirect method. The direct method allows the user to directly enter a stage-damage relationship for any structure. This approach is commonly used for large or unique properties such as industrial or public buildings. The indirect method quantifies the stage-damage relationship for a group of structures that have significant commonality. Typically damage to residential structures is calculated using the indirect method. The procedures described in the following paragraphs apply only when using the indirect method to determine the stage-damage relationship.

b. The traditional approach to quantifying damage to contents by the indirect method relies on three pieces of information: 1) structure value; 2) content-to-structure value ratio; and 3) the content depth-damage relationship. The content-to-structure value ratio and content depth-damage relationship are unique to the structure occupancy type to which a structure is assigned. The content depth-damage relationship provides the estimate of content flood damage as a percentage of content value. Thus, to calculate a content stage-damage function for an individual structure, the structure value for an individual structure is first multiplied by the content-to-structure value ratio to provide an estimate of the content value. This content value is then multiplied by each percent damage value of the content depth-damage relationship.

c. The new content depth-damage functions provided herein are different from those used by the Corps in the past in one important aspect. The new functions calculate content damage as a percent of structure value rather than content value. Using these functions within HEC-FDA requires care in specifying a content-to-structure value ratio. To understand the requirements for using the new content depth-damage functions requires a basic understanding of how HEC-FDA calculates content damage.

(1). To calculate damages by the indirect method, each structure must be assigned to a structure occupancy type. For each structure occupancy type a content-to-structure value ratio and content depth-damage relationship are defined. These data for calculating content damage within HEC-FDA is entered on the “Study Structure Occupancy Type” screen. As long as a content value is not entered for a structure in the Structure Inventory Data, HEC-FDA calculates the content stage-damage by first calculating content using the structure value multiplied by the content-to-structure value ratio.

In some instances, however, analysts develop unique estimates of content values for a structure, which are entered for the individual structure on the Structure Inventory Data screen. For each structure that has a content value entered, calculating a content value by using the content-to-structure value ratio is ignored and the user entered content value is used to calculate content damage.

(2). The new content depth-damage functions do not require this intermediate step of calculating content values. Therefore, the content-to-structure value ratio for each structure occupancy type using the new content depth-damage relationships must be set to one hundred percent (100). This forces the content depth-damage function to be multiplied by the structure value as required. Also, the “Error Associated with Content/Structure Value” on the “Study Structure Occupancy Type” screen

should be left blank. This implies that the error in content-to-structure value ratio is part of the new content depth-damage relationship.

(3). Because entering a content value on the Structure Inventory Data window overrides the content-to-structure value ratio, the new content depth-damage relationship should not be used for structures that have separately entered content values.

(4). Questions concerning the use of the generic curves within the HEC-FDA model can be addressed to Dr. David Moser, Institute of Water Resources (IWR), (703)428-8066.

5. Report. A report summarizing the data collection effort and analyses performed to derive these curves will shortly be available on the IWR website. More information may be obtained by contacting the program's principal investigator, Stuart Davis, (703) 428- 7086.

6. Waiver to Policy. These curves are developed for nation-wide applicability in flood damage reduction studies. When using these curves, the requirement to develop site-specific depth-damage curves contained in ER 1105-2-100, E-19q.(2) is waived. Additionally, the requirement to develop content valuations and content-to-structure ratios based on site-specific or comparable floodplain information, ER 1005-2-100, E- 19q.(1)(a), is also waived. Note these waivers currently apply only to single-family homes with and without basements for which generic curves have been published, and not other categories of flood inundation damages for which no generic curves exist. Feasibility reports must state the generic curves are being used in the flood damage analysis for residential structures with and/or without basements. Use of these curves is optional and analysts should always endeavor to use the best available information to accurately quantify the damages and benefits in inundation reduction studies.

7. Point of Contact. Administrators of the Flood Damage Data Collection Program continue to collect and analyze flood-related damages to both residential and commercial properties. The HQUSACE program monitor is Lillian Almodovar, (202) 761-4233, who can address any questions concerning the program.

FOR THE COMMANDER:

/s/

Encl

WILLIAM R. DAWSON, P.E.

Chief, Planning and Policy Division
Directorate of Civil Works

DISTRIBUTION:

North Atlantic Division, ATTN: CENAD-ET-PSouth Atlantic Division, ATTN: CESAD-ET-P

Great Lakes/Ohio River Division: ATTN: CELRD-E-PNorthwestern Division, ATTN: CENWD-PNP-ET-P
Pacific Ocean Division, ATTN: CEPOD-ET-E

South Pacific Division, ATTN: CESPDP-ET-P Southwestern Division, ATTN: CESWD-ET-P Mississippi Valley
Division: ATTN: CEMVD-PM

DAMAGE FUNCTIONS
FOR SINGLE FAMILY RESIDENTIAL STRUCTURES
WITH BASEMENTS

Structure Depth-Damage

Table 1		
Structure		
One Story, With Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-8	0%	0
-7	0.7%	1.34
-6	0.8%	1.06
-5	2.4%	0.94
-4	5.2%	0.91
-3	9.0%	0.88
-2	13.8%	0.85
-1	19.4%	0.83
0	25.5%	0.85
1	32.0%	0.96
2	38.7%	1.14
3	45.5%	1.37
4	52.2%	1.63
5	58.6%	1.89
6	64.5%	2.14
7	69.8%	2.35
8	74.2%	2.52
9	77.7%	2.66
10	80.1%	2.77
11	81.1%	2.88
12	81.1%	2.88
13	81.1%	2.88
14	81.1%	2.88
15	81.1%	2.88
16	81.1%	2.88

Table 2 Structure Two or More Stories, With Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-8	1.7%	2.70
-7	1.7%	2.70
-6	1.9%	2.11
-5	2.9%	1.80
-4	4.7%	1.66
-3	7.2%	1.56
-2	10.2%	1.47
-1	13.9%	1.37
0	17.9%	1.32
1	22.3%	1.35
2	27.0%	1.50
3	31.9%	1.75
4	36.9%	2.04
5	41.9%	2.34
6	46.9%	2.63
7	51.8%	2.89
8	56.4%	3.13
9	60.8%	3.38
10	64.8%	3.71
11	68.4%	4.22
12	71.4%	5.02
13	73.7%	6.19
14	75.4%	7.79
15	76.4%	9.84
16	76.4%	12.36

Table 3 Structure Split Level, With Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-8		
-7		
-6	2.5%	1.8%
-5	3.1%	1.6%
-4	4.7%	1.5%
-3	7.2%	1.6%
-2	10.4%	1.6%
-1	14.2%	1.6%
0	18.5%	1.6%
1	23.2%	1.7%
2	28.2%	1.9%
3	33.4%	2.1%
4	38.6%	2.4%
5	43.8%	2.6%
6	48.8%	2.9%
7	53.5%	3.2%
8	57.8%	3.4%
9	61.6%	3.6%
10	64.8%	3.9%
11	67.2%	4.2%
12	68.8%	4.8%
13	69.3%	5.7%
14	69.3%	5.7%
15	69.3%	5.7%
16	69.3%	5.7%

Content Depth-Damage

Table 4 Content One Story, With Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-8	0.1%	1.60
-7	0.8%	1.16
-6	2.1%	0.92
-5	3.7%	0.81
-4	5.7%	0.78
-3	8.0%	0.76
-2	10.5%	0.74
-1	13.2%	0.72
0	16.0%	0.74
1	18.9%	0.83
2	21.8%	0.98
3	24.7%	1.17
4	27.4%	1.39
5	30.0%	1.60
6	32.4%	1.81
7	34.5%	1.99
8	36.3%	2.13
9	37.7%	2.25
10	38.6%	2.35
11	39.1%	2.45
12	39.1%	2.45
13	39.1%	2.45
14	39.1%	2.45
15	39.1%	2.45
16	39.1%	2.45

Table 5 Content Two or More Stories-With Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-8	0%	0
-7	1.0%	2.27
-6	2.3%	1.76
-5	3.7%	1.49
-4	5.2%	1.37
-3	6.8%	1.29
-2	8.4%	1.21
-1	10.1%	1.13
0	11.9%	1.09
1	13.8%	1.11
2	15.7%	1.23
3	17.7%	1.43
4	19.8%	1.67
5	22.0%	1.92
6	24.3%	2.15
7	26.7%	2.36
8	29.1%	2.56
9	31.7%	2.76
10	34.4%	3.04
11	37.2%	3.46
12	40.0%	4.12
13	43.0%	5.08
14	46.1%	6.39
15	49.3%	8.08
16	52.6%	10.15

Table 6 Content Split-Level-With Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-8	0.6%	2.09
-7	0.7%	1.49
-6	1.4%	1.14
-5	2.4%	1.01
-4	3.8%	1.00
-3	5.4%	1.02
-2	7.3%	1.03
-1	9.4%	1.04
0	11.6%	1.06
1	13.8%	1.12
2	16.1%	1.23
3	18.2%	1.38
4	20.2%	1.57
5	22.1%	1.76
6	23.6%	1.95
7	24.9%	2.13
8	25.8%	2.28
9	26.3%	2.44
10	26.3%	2.44
11	26.3%	2.44
12	26.3%	2.44
13	26.3%	2.44
14	26.3%	2.44
15	26.3%	2.44
16	26.3%	2.44

**ENCLOSURE DAMAGE
FUNCTIONS
FOR SINGLE FAMILY RESIDENTIAL
STRUCTURES WITHOUT BASEMENTS**

Structure One Story, No Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-2	0%	0%
-1	2.5%	2.7%
0	13.4%	2.0%
1	23.3%	1.6%
2	32.1%	1.6%
3	40.1%	1.8%
4	47.1%	1.9%
5	53.2%	2.0%
6	58.6%	2.1%
7	63.2%	2.2%
8	67.2%	2.3%
9	70.5%	2.4%
10	73.2%	2.7%
11	75.4%	3.0%
12	77.2%	3.3%
13	78.5%	3.7%
14	79.5%	4.1%
15	80.2%	4.5%
16	80.7%	4.9%

Structure Two or More Stories-No Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-2	0%	0%
-1	3.0%	4.1%
0	9.3%	3.4%
1	15.2%	3.0%
2	20.9%	2.8%
3	26.3%	2.9%
4	31.4%	3.2%
5	36.2%	3.4%
6	40.7%	3.7%
7	44.9%	3.9%
8	48.8%	4.0%
9	52.4%	4.1%
10	55.7%	4.2%
11	58.7%	4.2%
12	61.4%	4.2%
13	63.8%	4.2%
14	65.9%	4.3%
15	67.7%	4.6%
16	69.2%	5.0%

Structure Split-Level-No Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-2	0%	0%
-1	6.4%	2.9%
0	7.2%	2.1%
1	9.4%	1.9%
2	12.9%	1.9%
3	17.4%	2.0%
4	22.8%	2.2%
5	28.9%	2.4%
6	35.5%	2.7%
7	42.3%	3.2%
8	49.2%	3.8%
9	56.1%	4.5%
10	62.6%	5.3%
11	68.6%	6.0%
12	73.9%	6.7%
13	78.4%	7.4%
14	81.7%	7.9%
15	83.8%	8.3%
16	84.4%	8.7%

Content One Story, No Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-2	0%	0%
-1	2.4%	2.1%
0	8.1%	1.5%
1	13.3%	1.2%
2	17.9%	1.2%
3	22.0%	1.4%
4	25.7%	1.5%
5	28.8%	1.6%
6	31.5%	1.6%
7	33.8%	1.7%
8	35.7%	1.8%
9	37.2%	1.9%
10	38.4%	2.1%
11	39.2%	2.3%
12	39.7%	2.6%
13	40.0%	2.9%
14	40.0%	3.2%
15	40.0%	3.5%
16	40.0%	3.8%

Content Two or More Stories-No Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-2	0%	0%
-1	1.0%	3.5%
0	5.0%	2.9%
1	8.7%	2.6%
2	12.2%	2.5%
3	15.5%	2.5%
4	18.5%	2.7%
5	21.3%	3.0%
6	23.9%	3.2%
7	26.3%	3.3%
8	28.4%	3.4%
9	30.3%	3.5%
10	32.0%	3.5%
11	33.4%	3.5%
12	34.7%	3.5%
13	35.6%	3.5%
14	36.4%	3.6%
15	36.9%	3.8%
16	37.2%	4.2%

Content Split-Level-No Basement		
Depth	Mean of Damage	Standard Deviation of Damage
-2	0%	0%
-1	2.2%	2.2%
0	2.9%	1.5%
1	4.7%	1.2%
2	7.5%	1.3%
3	11.1%	1.4%
4	15.3%	1.5%
5	20.1%	1.6%
6	25.2%	1.8%
7	30.5%	2.1%
8	35.7%	2.5%
9	40.9%	3.0%
10	45.8%	3.5%
11	50.2%	4.1%
12	54.1%	4.6%
13	57.2%	5.0%
14	59.4%	5.4%
15	60.5%	5.7%
16	60.5%	6.0%

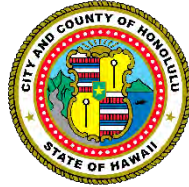
City and County of Honolulu 2021 Repetitive Loss Area Analysis

Appendix B. Letter to Repetitive Loss Area Residents

OFFICE OF CLIMATE CHANGE, SUSTAINABILITY AND RESILIENCY
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11th FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-2277 • EMAIL: resilientoahu@honolulu.gov • INTERNET: www.resilientoahu.org

RICK BLANGIARDI
MAYOR



MATTHEW GONSER, AICP, CFM
EXECUTIVE DIRECTOR &
CHIEF RESILIENCE OFFICER

July 7, 2021

<<Property Owner>>

<<Mailing Address>>

<<Mailing City>>

SUBJECT: City and County of Honolulu Repetitive Loss Area Analysis

Dear Resident:

You are receiving this letter because, in an effort to help reduce the risk of flood damage to properties, the City and County of Honolulu (City) Office of Climate Change, Sustainability and Resiliency (Resilience Office) is studying areas that have been or could be impacted by repetitive flooding. Your property at the above listed address has been identified to be in or near an area potentially vulnerable to repetitive flooding.

The City is preparing an application to join the National Flood Insurance Program (NFIP) Community Rating System (CRS). Administered by the Federal Emergency Management Agency (FEMA), the CRS credits community efforts beyond NFIP minimum standards by reducing flood insurance premiums for the community's flood insurance policy holders. CRS discounts on flood insurance premiums range from 5 percent up to 45 percent based on CRS credit points that are awarded to a participating community (e.g., the Counties of Hawai'i and Maui are both Class 7 CRS communities and policy holders receive 15 percent discounts on annual flood insurance premiums). The discounts provide an incentive for communities to implement flood mitigation activities that can help save lives and property when a flood occurs.

The study of potential flooding areas is part of a Repetitive Loss Area Analysis (RLAA), which is a prerequisite for participation in the CRS. If the City is accepted to join the CRS, annual outreach efforts will be required to these identified Repetitive Loss Areas to inform property owners on ways they can reduce risk themselves and any actions taken by the City to address repetitive flood problems identified by the analysis. Local knowledge and context are important resources for analysis. With this letter, we request any comments, information, and/or suggestions about your area to support the final RLAA. The "Draft" analysis can be viewed at: <https://resilientoahu.org/get-flood-ready>.

Repetitive loss areas have been determined based on a list of Repetitive Loss Properties maintained by FEMA. A Repetitive Loss Property is any insurable building, which two or more flood insurance claims or more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978. The RLAA will study areas known by FEMA to have flooded in the past, but also broadens the area of analysis to include potentially at risk properties. The study offers residents options for possible mitigation measures to reduce potential flooding. Please note that specific property addresses, and owner names will not be included in the report and flood insurance claims have been aggregated as required for privacy purposes (Privacy Act of 1974, as amended). Please see Attachment A for frequently asked questions related to this analysis.

We encourage you to review the draft RLAA report and provide your comments to crs@honolulu.gov. Alternatively, you may also mail your comments to:

Re: CRS

Office of Climate Change, Sustainability and Resiliency

650 South King Street, 11th Floor

Honolulu, HI 96813

We look forward to receiving your feedback. If you have any questions, please contact Alexander Yee, Coastal and Water Program Manager, at 808-768-2277.

Sincerely,

Matthew Gonser

CRS Coordinator

Executive Director and

Chief Resilience Officer

Encl: Attachment A, FAQ

Attachment A

Frequently Asked Questions

- By receiving this letter, am I required to participate in the analysis?
 - a. NO, this is an open, but voluntary opportunity to provide comments.
- If I have never flooded, why did I receive this letter and offer for comments?
 - a. The RLAA covers a broad study of areas adjacent to structures that have flooded, in an effort to offer mitigation measures should a resident have the potential for future flooding and request information.
- If I have been impacted by one or more flooding events, is it possible to offer comments and remain confidential?
 - a. YES, all comments when aggregated, will not be identified by resident name or address, or any other identifying information.
- By receiving this letter, will I be required to purchase flood insurance?
 - a. NO, this is a broad study or analysis of areas that have the potential for flooding.
- Since I received this letter and I am not inside the FEMA special flood hazard area, can I buy flood insurance?
 - a. YES, flood insurance is available within the City and County of Honolulu by contacting an insurance agent.
- Will my homeowner's policy (Building and/or Contents) cover flooding?
 - a. NO, rising water from hurricane, storm surge and/or rain storms are not covered by a standard homeowner's policy.
- What type of mitigation measures are considered in the analysis?
 - a. There are a wide range of measures that are within these groups:
 - i. Preventative, e.g., building codes
 - ii. Property Protection, e.g., elevation
 - iii. Natural Resource Protection, e.g., preserve natural areas
 - iv. Emergency Services, e.g., actions taken during flood incident
 - v. Structural Projects, e.g., flood mitigation measures
 - vi. Public Information, e.g., HNL.info notifications
- Will I be able to find my address in the RLAA
 - a. NO. The Federal Government passed the Privacy Act that prohibits release of actual repetitive loss properties identified by FEMA.
- If the City becomes a CRS community and if I have a flood insurance policy, how will I receive the CRS discount?
 - a. At your next policy renewal date after May 1, 2022, the discount will automatically be applied.
- Will this analysis result in an increase in my flood insurance costs if I already have a policy?

- a. NO. This analysis is informational to inform the City on possible ways to reduce the causes or impacts from repetitive flooding.
- For residents or homeowners who wish to implement flood mitigation measures, is any funding assistance available?
 - a. YES. There are a variety of federal and state grants that can be made available. Some require matching funds, some may not.

City and County of Honolulu 2021 Repetitive Loss Area Analysis

Appendix C. Federal and State Agencies, Programs and Regulations

C. FEDERAL AND STATE AGENCIES, PROGRAMS AND REGULATIONS

Existing laws, ordinances, plans and programs at the federal and state level can support or impact flood hazard mitigation actions identified in this plan. The following federal and state programs have been identified as programs that may interface with the actions identified in this plan. Each program enhances capabilities to implement recommended actions or has a nexus with a recommended action in this plan.

FEDERAL

National Flood Insurance Program

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities that enact floodplain regulations. For most participating communities, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 100-year flood (or base flood) and the 500-year flood. Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program.

Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a flood-prone area, participating jurisdictions must, at a minimum, ensure that the project meets the following criteria (44 CFR Part 60, Section 60.3):

- Be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy,
- Be constructed with materials resistant to flood damage
- Be constructed by methods and practices that minimize flood damage
- Be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

Additional criteria apply depending on the availability of information about the flood hazard.

Community Rating System

The CRS is a voluntary program within the NFIP that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions to meet the CRS goals of reducing flood losses, facilitating accurate insurance rating and promoting awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 9 community would receive a 5 percent premium discount, a Class 8 community would receive a 10 percent premium discount, and so on, until reaching a 45 percent premium discount for a Class 1 community. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public information
- Mapping and regulations
- Flood damage reduction
- Flood preparedness.

CRS activities can help to save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk; over 66 percent of the NFIP's policy base is located in these communities. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including both coastal and riverine flood risks.

Disaster Mitigation Act

The federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) provides the legal basis for FEMA mitigation planning requirements for state, local and Indian tribal governments as a condition of mitigation grant assistance. The DMA replaced previous federal mitigation planning provisions with new requirements that emphasize the need for planning entities to coordinate mitigation planning and implementation efforts. The DMA established a new requirement for local mitigation plans and authorized up to 7 percent of Hazard Mitigation Grant Program funds to be available for development of state, local, and Indian tribal mitigation plans.

Biggert-Waters Flood Insurance Reform Act of 2012 and Homeowner Flood Insurance Affordability Act of 2014

The Biggert-Waters Flood Insurance Reform Act of 2012 authorized and funded a national mapping program. It also authorized insurance premium rate increases to ensure the fiscal soundness of the NFIP by transitioning the program from subsidized rates, also known as artificially low rates, to offer full actuarial rates reflective of risk.

The Homeowner Flood Insurance Affordability Act of 2014 repealed parts of Biggert-Waters, restoring grandfathering, putting limits on certain rate increases and updating the approach to ensuring the fiscal soundness of the fund by applying an annual surcharge to all policyholders.

Endangered Species Act

The federal Endangered Species Act (ESA) was enacted in 1973 to conserve species facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened

and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

In some parts of the country, including the Pacific Northwest and the Sacramento-San Joaquin Delta area, court rulings have found that floodplain management measures can be in conflict with the goals of the endangered species act. Those rulings have required FEMA and local governments to engage in a consultation process with federal wildlife agencies (Section 7 of the ESA) as they work to develop certain floodplain management programs, plans and projects.

Clean Water Act

The federal Clean Water Act (CWA) employs regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's surface waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining water quality and other environmental goals is a hallmark of this approach.

National Incident Management System

The National Incident Management System (NIMS) is a systematic approach for government, nongovernmental organizations, and the private sector to work together to manage incidents involving floods and other hazards. The NIMS provides a flexible but standardized set of incident management practices. Incidents typically begin and end locally, and they are managed at the lowest possible geographical, organizational, and jurisdictional level. In other instances, success depends on the involvement of multiple jurisdictions, levels of government, functional agencies, and emergency-responder disciplines. These instances necessitate coordination across this spectrum of organizations. Communities using NIMS follow a comprehensive national approach that improves the effectiveness of emergency management and response personnel across the full spectrum of potential hazards (including natural hazards, terrorist activities, and other human-caused disasters) regardless of size or complexity.

Americans with Disabilities Act

The Americans with Disabilities Act (ADA) seeks to prevent discrimination against people with disabilities in employment, transportation, public accommodation, communications, and government activities. The most recent amendments became effective in January 2009 (Public Law 110-325). Title II of the ADA deals with compliance

with the Act in emergency management and disaster-related programs, services, and activities. It applies to state and local governments as well as third parties, including religious entities and private nonprofit organizations.

The ADA has implications for sheltering requirements and public notifications. During an emergency alert, officials must use a combination of warning methods to ensure that all residents have any necessary information. Those with hearing impairments may not hear radio, television, sirens, or other audible alerts, while those with visual impairments may not see flashing lights or visual alerts. Two stand-alone technical documents have been issued for shelter operators to meet the needs of people with disabilities. These documents address physical accessibility as well as medical needs and service animals.

The ADA also intersects with disaster preparedness programs in regards to transportation, social services, temporary housing, and rebuilding. Persons with disabilities may require additional assistance in evacuation and transit (e.g., vehicles with wheelchair lifts or paratransit buses). Evacuation and other response plans should address the unique needs of residents. Local governments may be interested in implementing a special-needs registry to identify the home addresses, contact information, and needs for residents who may require more assistance.

Public Law 8499, Flood Control and Coastal Emergencies

Federal law that gives the U.S. Army Corps of Engineers the legal authority to conduct emergency preparation, response, and recovery activities and to supplement local efforts in the repair of flood damage reduction projects that have been damaged by floods. Under Public Law 8499, the Corps' Chief of Engineers is authorized to undertake activities including disaster preparedness, advance measures to prevent or reduce damage when there is an imminent threat of unusual flooding, emergency operations (flood response and post-flood response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protective works threatened or damaged by coastal storm, and provision of emergency water in the event of drought or contaminated source.

STATE

Hawai'i Coastal Zone Management Program

In response to the federal Coastal Zone Management Act, the State of Hawai'i established its coastal zone management program in 1977 (Chapter 205A, Hawai'i Revised Statutes). Managed by the State Office of Planning, Hawai'i's CZM program provides a common focus for state and county actions dealing with land and water uses and activities. Under the CZM program, agencies must look at resources from a broader ecosystem perspective instead of individual species or resources. The CZM law builds upon the authorities and responsibilities of state and county agencies to form a network based on legal and operational compliance with the law's objectives and policies. All agencies must ensure that their statutes, ordinances, rules, and actions comply with the CZM objectives and policies (State of Hawai'i Office of Planning, 2015).

The CZM area encompasses the entire state because there is no point of land more than 30 miles from the ocean. What occurs on land, even on the mountains, impacts and influences the quality of coastal waters and marine resources. The CZM area extends seaward to the limit of the state's police power and management authority, to include the territorial sea. This legal seaward boundary definition is consistent with Hawai'i's historical claims over the Hawaiian archipelagic waters, based on ancient transportation routes and submerged lands.

Hawai'i Hazards Awareness and Resilience Program

The aim of the Hawai'i Hazards Awareness and Resilience Program (HHARP) is to help communities prepare to be self-reliant during and after natural hazard events, improve their ability to take care of their own needs, and reduce the negative impacts of disasters. HHARP can enhance community resilience through education and outreach sessions that build awareness and understanding of hazard mitigation, preparedness, response and recovery. State and county emergency management agencies have partnered to administer HHARP in support of community leaders willing to implement the program. The resources in the HHARP program and accompanying HHARP resource kit will help communities build resilience through:

- Increasing awareness of hazards
- Enhancing understanding of official warning information
- Educating residents about response actions
- Improving personal preparedness
- Helping communities identify useful skills and resources they already have
- Developing the understanding needed to select appropriate hazard mitigation measures
- Guiding communities in the development of emergency plans and exercises
- Providing support for community outreach events
- Identifying opportunities for additional training and education

Hawai'i State Plan

The Hawai'i State Plan is a long-range comprehensive plan that includes an overall theme, goals, objectives, policies, priority guidelines, and implementation mechanisms. The Hawai'i State Plan achieves the following:

- Serves as a guide for the future long-range development of the state
- Identifies the goals, objectives, policies, and priorities for the state
- Provides a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources
- Improves coordination of federal, state, and county plans, policies, programs, projects, and regulatory activities
- Establishes a system for plan formulation and program coordination to provide for an integration of all major state, and county activities

The State Plan is divided into three parts:

- Part I lists the State Plan's overall theme and goals. Objectives and policies focus on general topic areas, including population, economy, physical environment, facility systems, and socio-cultural advancement.
- Part II establishes a statewide planning system to coordinate and guide all major state and county activities and to implement the overall theme, goals, objectives, policies, and priority guidelines. The system implements the State Plan through the development of functional plans and county general plans.
- Part III establishes overall priority guidelines to address areas of statewide concern. This part lays out the overall direction for the state in five major areas of statewide concern: economic development, population

growth and land resource management, affordable housing, crime and criminal justice, and quality education.

Hawai'i State Grants-in-Aid Capital Improvement Projects Program

The Hawai'i State Legislature makes appropriations for grants in accordance with Chapter 42F of the Hawai'i Revised Statutes. The grants support events, programs, and facilities that benefit the community. There are two types of grants: operating and capital improvement project grants. Funds are available on a reimbursement basis and payments are contingent upon fulfillment of the terms and conditions of the grant agreement. Grantees must submit documents to verify that they meet the standards for the award of grants.

Ocean Resources Management Plan

The Ocean Resources Management Plan is a comprehensive plan for conservation and sustainability of ocean and coastal resources (Chapters 205A and 225M, Hawai'i Revised Statutes). Hawai'i is facing pressures that will have a significant impact on ocean and coastal environments, including urbanization, tourism, recreational and commercial ocean uses, sea level rise and other natural hazards to include beach erosion, inundation of land, increased flood and storm damage, saltwater intrusion into the freshwater lens aquifer, the rising of the water table, and more frequent or more powerful weather events, marine debris, and invasive species. The Ocean Resources Management Plan was updated in 2013 to address these issues.

State Building Code and Design Standards

In 2007, the State Legislature created State Building Code Council with the authority to establish codes applicable to all construction in the State of Hawai'i (Chapter 107, Hawai'i Revised Statutes). The State Building Code Council evaluates model building codes and develops amendments necessary to make the codes appropriate for conditions in Hawai'i. Once the Council develops and approves a code for Hawai'i, it is legally adopted into the Hawai'i Administrative Rules (HAR). Counties have two years from the date of establishment of the HAR State Building Code to adopt the Hawai'i State Building Code as local county code, with the addition of any locally approved county amendments. The process has successfully enabled a unified set of nearly comprehensive building codes to be adopted by the state and the counties.

State General Flood Control Plan

As authorized by the Hawai'i Revised Statutes Chapter 179 Flood Control and Flood Water Conservation, the State General Flood Control Plan (SGFCP) serves as a guide for linking partnering agencies and community groups. The plan provides these stakeholders with the data and tools required to strategize flood improvement needs and goals.

The most recent update allows all stakeholders to view and analyze flood-prone areas and/or flood mitigation needs. The updated SGFCP also enables users to locate project partners and build on current or previously completed flood improvement efforts. The plan update increases each stakeholder's ability to complete projects by integrating best practices and lessons learned from other partner agencies and through resource sharing.

State of Hawai‘i Hazard Mitigation Plan

The *State of Hawai‘i 2018 Hazard Mitigation Plan* identifies the major natural hazards that affect Hawai‘i, assesses the risk that each hazard poses, analyzes the vulnerability of people, property and infrastructure to the specific hazard, and recommends actions that can be taken to reduce the risk and vulnerability to the hazard. The State Hazard Mitigation Plan also contains a description of programs, policy, statutes and regulations applicable to hazard mitigation statewide.

State of Hawai‘i Land Use Law

The Hawai‘i State Legislature adopted the State Land Use Law (Chapter 205, Hawai‘i Revised Statutes) in 1961. The Land Use Commission administers statewide zoning established in the State Land Use law. The law classifies lands throughout the state into one of four districts:

- The Urban District generally includes lands characterized by “city-like” concentrations of people, structures and services. This district also includes vacant areas for future development. Jurisdiction of this district lies primarily with counties.
- The Rural District consists primarily of small farms intermixed with low-density residential lots with a minimum size of 0.5-acre. The Land Use Commission and County governments share jurisdiction over rural districts. Permitted uses include those relating or compatible with agricultural use and low-density residential lots.
- The Agricultural District includes land with significant potential for agriculture uses as well as lands used for the cultivation of crops, aquaculture, raising livestock, wind energy generation, timber cultivation, and agriculture-support (mills, employee quarters, etc.). Uses permitted in the highest productivity agricultural categories (A or B) are governed by statute. Uses in lower-productivity categories (C, D, E, or U) include those allowed on A or B lands as well as uses stated under Section 205-4.5, Hawai‘i Revised Statutes.
- The Conservation District consists primarily of lands in existing forest and water reserve zones. These include areas necessary for protecting watersheds and water sources; scenic and historic areas; parks, wilderness, open space and recreational areas; habitats of endemic plants, fish and wildlife; submerged lands seaward of the shoreline; and lands subject to flooding and soil erosion. The State Board of Land and Natural Resources administrates conservation districts.

City and County of Honolulu 2021 Repetitive Loss Area Analysis

Appendix D. RLAA Adoption Resolution

D. RLAA ADOPTION RESOLUTION

TO BE PROVIDED WITH FINAL DRAFT REPORT