RESOLUTION No. 19-62

A RESOLUTION OF THE MAYOR AND THE CITY COUNCIL OF THE CITY OF DORAL, FLORIDA, APPROVING/DENYING THE CITY OF DORAL REPETITIVE LOSS AREA ANALYSIS (RLAA) REPORT IN ACCORDANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMMUNITY RATING SYSTEM (CRS) CREDIT CRITERIA FOUND IN ACTIVITY 512.b OF THE CRS COORDINATOR'S MANUAL; PROVIDING FOR IMPLEMENTATION; AND PROVIDING FOR AN EFFECTIVE DATE

WHEREAS, the National Flood Insurance Program's (NFIP) was created by Congress to provide a means for property owners to protect themselves financially from flood events by providing affordable insurance to property owners, renters and businesses and by encouraging communities to adopt and enforce floodplain management regulations; and

WHEREAS, flooding is the most common natural hazard in the United States that accounts for more than 70 percent of all Presidential Disaster Declarations; and

WHEREAS, in the United States, over 8 million residential and commercial structures are currently built in areas at risk of flooding; and

WHEREAS, repetitive loss properties are defined by FEMA as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978; and

WHEREAS, repetitive loss properties are one of two of the largest obstacles to achieving financial soundness of the NFIP; and

WHEREAS, since the inception of the NFIP, over $9 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments; and

WHEREAS, currently, repetitive loss properties represent 1.3% of all policies, but

are expected to account for 15% to 20% of future losses; and

WHEREAS, according to January 2017 repetitive loss data report from FEMA, there are a total of 67 unmitigated and 2 mitigated repetitive loss properties within the City of Doral; and

WHEREAS, the City of Doral is required to maintain and update annually the number of repetitive loss data in order to participate in the CRS; and

WHEREAS, the City of Doral is considered by the CRS as a "Category C Community" because it has more than 50 repetitive loss properties within its jurisdictional boundaries is required to map repetitive loss areas, describe its repetitive loss problem, undertake outreach to all addresses in the repetitive loss areas that have insurable buildings, and prepare either a floodplain management plan or repetitive loss area analysis that addresses all repetitive loss areas; and

WHEREAS, the City opted to complete a RLAA Report using the 2017 CRS Coordinator's Manual to meet the "Category C Community" requirements; and

WHEREAS, the Mayor and City Council of the City of Doral finds that the adoption and implementation of this Resolution is in the best interest and welfare of the residents of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF DORAL, FLORIDA, AS FOLLOWS:

Section 1. Recitals. The foregoing recitals are confirmed, adopted, and incorporated herein and made a part hereof by this reference.

Section 2. Authorization. The City Council hereby approves/denies the RLAA Report prepared by Wood Group (formerly Amec Foster Wheeler Environmental and

Infrastructure, Inc.,) consistent with the NFIP Community Rating System credit criteria found in Activity 512.b of the CRS Coordinator's Manual. A copy of the RLAA Report is enclosed in Exhibit A.

Section 3. Effective Date. This Resolution shall take effect immediately upon adoption.

The foregoing Resolution was offered by Vice Mayor Mariaca who moved its adoption. The motion was seconded by Councilmember Cabral and upon being put to a vote, the vote was as follows:

Mayor Juan Carlos Bermudez	Yes
Vice Mayor Claudia Mariaca	Yes
Councilwoman Digna Cabral	Yes
Councilman Pete Cabrera	Absent/Excused
Councilwoman Christi Fraga	Yes

PASSED AND ADOPTED this 13 day of March, 2019.

JUAN CARLOS BERMUDEZ, MAYOR

ATTEST:

CONNIE DIAZ, MMC
CITY CLERK

APPROVED AS TO FORM AND LEGAL SUFFICIENCY
FOR THE USE AND RELIANCE OF THE CITY OF DORAL ONLY:

LUIS FIGUEREDO, ESQ.
CITY ATTORNEY

EXHIBIT “A”

REPETITIVE LOSS AREA ANALYSIS

City of Doral, Florida

January 2019

Public Version

wood.

Table of Contents

List of Tables

List of Figures

1 Repetitive Loss Area Analysis

Background

Flooding is the most common natural hazard in the United States. More than 20,000 communities experience floods and this hazard accounts for more than 70 percent of all Presidential Disaster Declarations. In the United States, over 8 million residential and commercial structures are currently built in areas at risk to flooding. The cost of recovery is spread over local, state and federal governments and the victims themselves, who are directly affected by these disasters.

The National Flood Insurance Program (NFIP) is continually faced with the challenge of balancing the financial soundness of the program with the competing expectation of keeping premiums affordable. Repetitive loss properties are one of the two largest obstacles to achieving financial soundness of the NFIP. Since the inception of the NFIP, over $9 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments. While the NFIP has resulted in forty years of successful floodplain management, and many of these structures are no longer insured, repetitive loss properties are still a drain on the NFIP. Currently, repetitive loss properties represent 1.3% of all policies, but are expected to account for 15% to 20% of future losses.

Private insurance companies faced with high losses have several options to keep turning a profit. They can raise income through premium rate increases, decrease payments to insurers or reduce the exposure to the hazard. Unfortunately, the NFIP can only do what is allowed by statute. If losses increase, the Federal Emergency Management Agency (FEMA) is authorized by Congress to make incremental adjustments to increase the premium rates and reduce overall coverage. FEMA is not permitted to eliminate coverage for any policy holder including high-risk properties. Actuarial rates cannot be charged to buildings built before State and local floodplain management regulations went into effect. Since repetitive flood claims must be paid, FEMA has no choice but to spread these costs among all policyholders.

Sometimes floodplain management regulations mitigate repetitive flood losses when a building is substantially damaged. A structure where the cost to repair is equal to or exceeds 50 percent of the building's value is considered substantially damaged. A substantially damaged building must be brought up to the same flood protection level as a new building under a community's floodplain management ordinance. Many repetitive loss buildings are not in a regulated floodplain or they do not get substantially damaged and remain at risk to future damage.

Many owners of properties that experience repetitive flooding are not aware of the magnitude of damage they are exposed to because they either purchased the property after the last flood or the seller or lender did not disclose the flood hazard. Disclosure of repetitive flooding is a problem due to the fact that repetitive loss areas are not shown on Flood Insurance Rate Maps (FIRMs) but instead must be identified and mapped by local communities.

The City of Doral (CID-120041) has been a regular participant in the NFIP since May 12, 2004. Previously, Doral was an unincorporated place in Miami-Dade County, which has participated in the NFIP since September 1972. The City incorporated from Miami-Dade County in 2003.

In addition to meeting the basic requirements of the NFIP, the City of Doral has completed additional floodplain management activities to participate in the Community Rating System (CRS) program, which rewards local communities with insurance premium discounts for taking actions to reduce flood risk and vulnerability. The City of Doral is currently a CRS Class 7, which rewards all policyholders in the SFHA with a 15 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 5% discount, and preferred risk policies receive no discount. Doral entered the CRS program on May 1, 2009.

4,125
NFIP Policies

$1.286 billion
in insurance coverage

As of July 2018, there are 4,125 NFIP Polices in force in the City with insurance coverage of over $1.28 billion. There have been 12 paid losses against the NFIP with a total payment of $290,828 within the City of Doral.

A repetitive loss property does not have to currently be insured to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured or have not had a flood insurance policy for several years. An insured property with two or more claims of $1,000 or more will make it a repetitive loss property. Once it is designated as a repetitive loss property, that property remains as a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. However, the community does not need to address mitigated properties like other repetitive loss properties; they are provided for community planning purposes only. Approximately 17 percent of all repetitive loss properties in the City of Doral, unmitigated and mitigated, are currently insured. Less than three percent of repetitive loss properties have been mitigated (see the Repetitive Loss Requirement Section).

TERMINOLOGY

REPETITIVE LOSS*:* Any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. Two of the claims paid must be more than 10 days apart but, within 10 years of each other. A repetitive loss property may or may not be currently insured by the NFIP.

SEVERE REPETITIVE LOSS*:* As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than $5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

According to January 2017 repetitive loss data from FEMA, there are a total of 67 unmitigated and 2 mitigated repetitive loss properties within the City of Doral. The 2017 CRS Coordinator's Manual requires that any community with more than 50 repetitive loss properties—considered a "Category C Community"—must map repetitive loss areas, describe its repetitive loss problem, undertake outreach to all addresses in the repetitive loss areas that have insurable buildings, and prepare either a floodplain management plan or repetitive loss area analysis that addresses all repetitive loss areas. In fulfillment of this requirement and in an effort to take greater responsibility for these repetitive loss properties and encourage mitigation, the City has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. This RLAA will benefit the City by examining potential mitigation measures for specific repetitive loss areas and increasing its credit in the CRS Program.

Setting

The City of Doral is located in the north of Miami-Dade County in southeastern Florida. Doral was incorporated in January 2003. The City has a total land area of approximately 13.9 square miles and a water area of approximately 1.3 square miles. As of 2016, according to the American Community Survey (ACS) 2012-2016 5-Year Estimates, the population of Doral was 53,426, which equates to an average population density of 3,844 people per square mile.

Much of the southeast and northwest portions of the City of Doral fall within Zone AH of the Special Flood Hazard Area (SFHA). Additional areas of Zone AE are interspersed throughout the City surrounding lakes, canals, and retention and detention basins. The topography of the City is very flat, and the average elevation is only 3 feet above sea level. The City of Doral sits within the C-4 and C-6 drainage basins. The C-4 and C-6 Canals, as well as the secondary NW Wellfield Canal which runs through the City of Doral, are maintained by the South Florida Water Management District. Heavy and prolonged rainfall causes the capacity of the City's drainage system and these larger regional drainage features to be exceeded and can also cause flooding along the City's waterways by exceeding their capacity. Additionally, the eastern and southern portions of the City fall within the storm surge zone E, indicating they are generally vulnerable to storm surge from a Category 5 hurricane.

The City is served by Ronald Reagan Turnpike, which runs north and south along the city's western border, Palmetto Expressway, which runs north and south along the eastern border, and Dolphin Expressway, which runs east and west along the southern border of the city. The city sits directly west of Miami International Airport.

Figure 1.1 reflects the City of Doral's location within Miami-Dade County and in relation to the surrounding cities and towns. Figure 1.2 illustrates the HUC-12 drainage basins and drainage features in and around Doral.

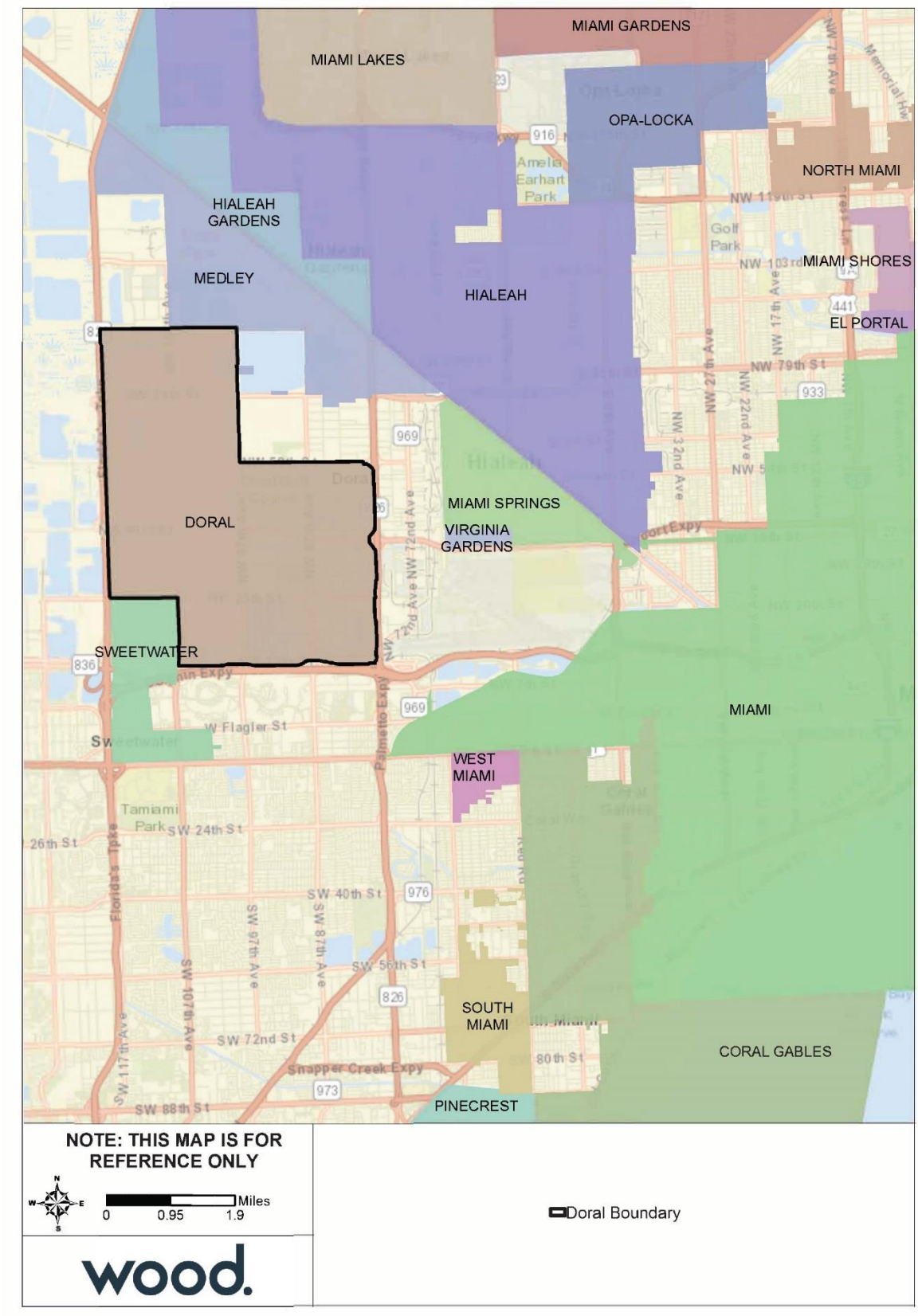


Figure 1.1 – City of Doral Location Map

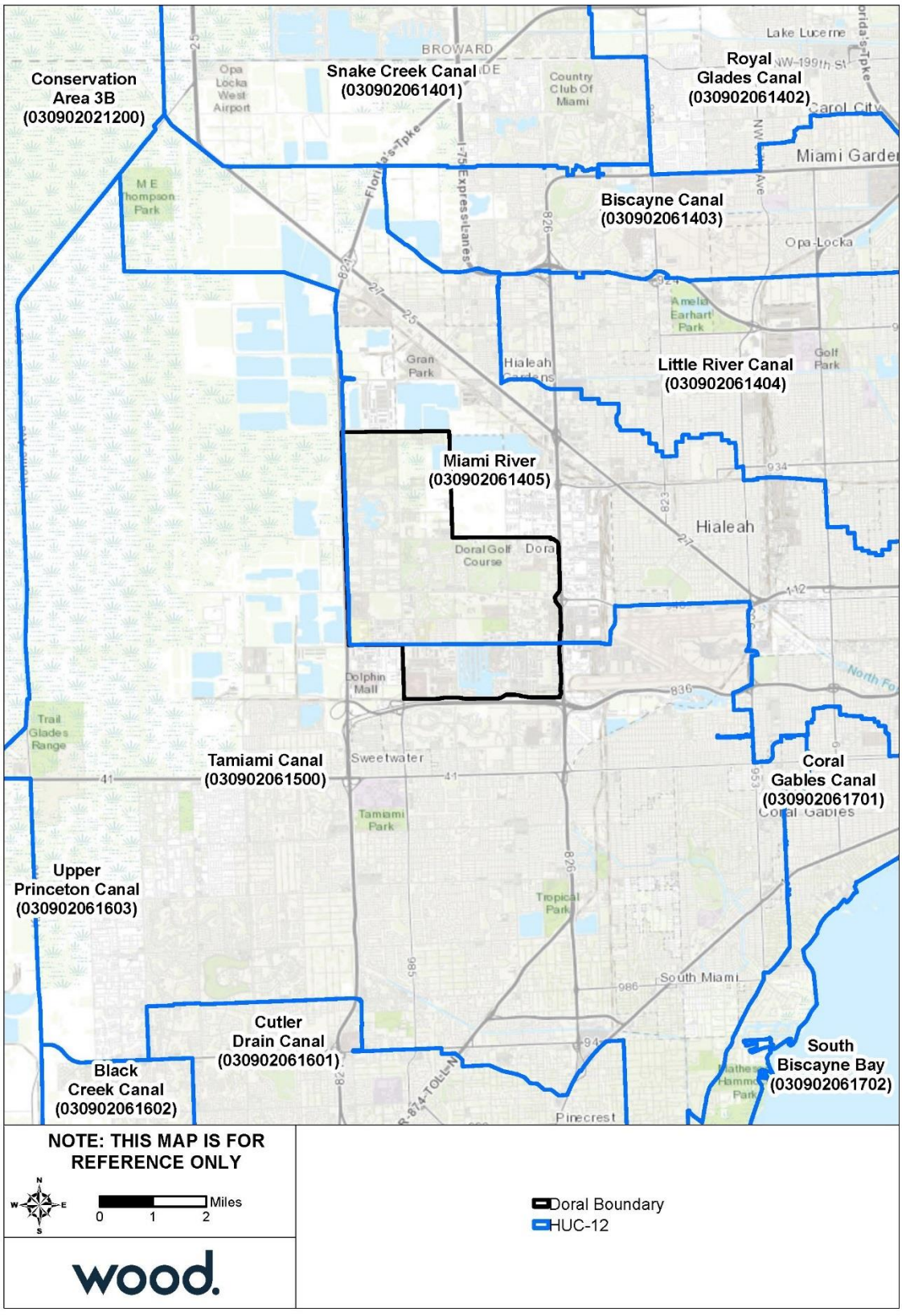


Figure 1.2 – City of Doral Drainage Map

Repetitive Loss Requirement

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A**: A community with no unmitigated repetitive loss properties. No special requirements from the CRS.
- **Category B**: A community with at least one, but fewer than 50, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss properties (areas) and complete an annual outreach activity directed to repetitive loss properties.
- **Category C**: A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss properties (areas) or prepare a RLAA for all repetitive loss areas.

Since the latest repetitive loss data obtained from FEMA for the City of Doral contained a total of 67 unmitigated repetitive loss properties, the City is designated as a Category C repetitive loss community. These 67 repetitive loss properties are summarized in Table 1.1.

Table 1.1 – Summary of Unmitigated Repetitive Loss Properties

Flood Zone[1]	Building Type		Building Count		Losses	Total Building Payment	Total Content Payment	Total Paid
	Residential	Non-Res.	Insured	Uninsured				
AHB		1		1	9	214,752.02	121,045.29	335,797.31
AHB		1		1	2	15,766.99	0.00	15,766.99
AH		1		1	3	0.00	53,751.88	53,751.88
AHB		1		1	9	558,352.57	2,197,592.91	2,755,945.48
AHB	1			1	2	5,493.28	0.00	5,493.28
AHB		1	1		3	0.00	238,589.99	238,589.99
AHB	1		SDF		5	901,385.67	0.00	901,385.67
AHB	1			1	4	116,930.96	0.00	116,930.96
AHB		1		1	3	0.00	220,215.88	220,215.88
AHB	1			1	2	12,618.90	7,200.00	19,818.90
AHB	1			1	3	23,152.33	0.00	23,152.33
AHB		1		1	3	29,205.93	0.00	29,205.93
AHB	1			1	2	15,436.58	0.00	15,436.58
AHB		1		1	2	37,436.57	0.00	37,436.57
AHB	1			1	2	11,743.17	0.00	11,743.17
AHB	1			1	2	30,258.74	0.00	30,258.74
AHB	1			1	2	9,229.82	0.00	9,229.82
AHB	1			1	2	18,265.93	0.00	18,265.93
AHB	1			1	2	7,379.97	0.00	7,379.97
AHB	1			1	2	13,891.62	0.00	13,891.62
AHB	1			1	2	15,357.95	0.00	15,357.95
AHB	1			1	2	49,351.96	0.00	49,351.96
AHB	1			1	2	76,100.34	0.00	76,100.34
AHB	1			1	3	822,319.42	194,742.83	1,017,062.25

Flood Zone[1]	Building Type		Building Count		Losses	Total Building Payment	Total Content Payment	Total Paid
	Residential	Non-Res.	Insured	Uninsured				
AHB		1		1	2	8,447.49	6,554.45	15,001.94
A		1		1	2	42,083.96	0.00	42,083.96
A		1		1	2	85,711.68	0.00	85,711.68
AHB		1	1		3	125,902.44	10,329.46	136,231.90
AHB		1		1	2	104,598.21	0.00	104,598.21
AHB	1		1		2	123,465.88	127,004.50	250,470.38
A	1			1	2	20,321.15	5,603.40	25,924.55
AHB	1			1	2	2,715.96	1,166.55	3,882.51
AHB	1			1	2	1,787.06	1,058.00	2,845.06
AHB	1			1	2	138,023.61	89,355.60	227,379.21
A		1		1	3	227,392.14	0.00	227,392.14
AHB		1		1	2	47,509.96	9,053.68	56,563.64
AH		1		1	2	0.00	19,793.01	19,793.01
AHB		1	1		3	535,482.32	0.00	535,482.32
AHB		1	1		3	555,187.06	0.00	555,187.06
AH		1		1	2	0.00	30,000.00	30,000.00
AHB		1	1		2	65,134.98	0.00	65,134.98
AHB	1		1		2	13,210.42	5,338.94	18,549.36
AHB		1	1		2	79,484.14	0.00	79,484.14
AHB		1		1	2	11,642.98	0.00	11,642.98
AHB		1	1		2	8,869.29	0.00	8,869.29
AHB	1			1	2	54,612.98	0.00	54,612.98
AHB	1			1	2	26,342.36	0.00	26,342.36
AHB	1			1	2	35,207.21	0.00	35,207.21
AHB	1			1	2	13,444.98	0.00	13,444.98
AHB	1			1	2	19,828.41	0.00	19,828.41
AHB	1			1	2	36,506.43	0.00	36,506.43
AHB	1			1	2	61,584.31	0.00	61,584.31
AHB	1			1	2	4,666.45	0.00	4,666.45
AHB		1		1	2	34,965.73	443,169.49	478,135.22
AHB		1		1	2	38,548.92	68,973.09	107,522.01
AH		1		1	2	27,163.91	236,928.43	264,092.34
AHB	1		1		3	79,198.93	59,705.09	138,904.02
AHB		1		1	2	7,932.79	48,023.87	55,956.66
AHB		1		1	2	61,439.01	28,180.06	89,619.07
AHB	1			1	2	9,105.21	125.00	9,230.21
AHB		1		1	2	0.00	4,021.42	4,021.42
AHB		1	1		2	22,505.82	63,656.63	86,162.45
AHB	1		1		3	48,844.02	47,928.60	96,772.62
AE		1		1	2	119,489.21	0.00	119,489.21
AHB		1		1	2	0.00	29,959.23	29,959.23
AHB		1		1	3	162,096.97	0.00	162,096.97
AHB		1		1	2	0.00	5,657.69	5,657.69
Total	**33**	**34**	**13**	**54**	**166**	**$6,044,885**	**$4,374,725**	**$10,419,610**

Source: NFIP Repetitive Loss Data, 01/31/2017

[1]Flood Zone is based on historical FIRM when first loss occurred. These zones do not reflect the current Effective FIRM zone for each property.

Mapping Repetitive Loss Areas

There were 25 Repetitive Loss Areas identified within the City of Doral in accordance with the principles outlined in the CRS guidance titled *Mapping Repetitive Loss Areas* dated August 15, 2008. The 25 Repetitive Loss Areas included the 67 unmitigated repetitive loss properties as well as historic claims properties (those with one paid claim against the NFIP), plus additional surrounding properties that have the same or similar flood conditions but have not had any claims paid against the NFIP. A total of 206 properties were included in this RLAA.

For reporting purposes, the Repetitive Loss Areas were broken into six subareas. The subareas and repetitive loss areas within them are summarized below. Figure 1.3 shows an overview map of the Repetitive Loss Areas grouped into subareas and in relation to the FEMA Flood Zones. A detailed map of each Subarea and Repetitive Loss Area is provided in Section 2.

- Subarea 1: Area 1, Area 2, Area 3, Area 4
- Subarea 2: Area 6, Area 7, Area 8, Area 9
- Subarea 3: Area 5, Area 10
- Subarea 4: Area 11, Area 12, Area 13, Area 14, Area 15
- Subarea 5: Area 16, Area 17, Area 18, Area 19, Area 20, Area 21, Area 22
- Subarea 6: Area 23, Area 24, Area 25

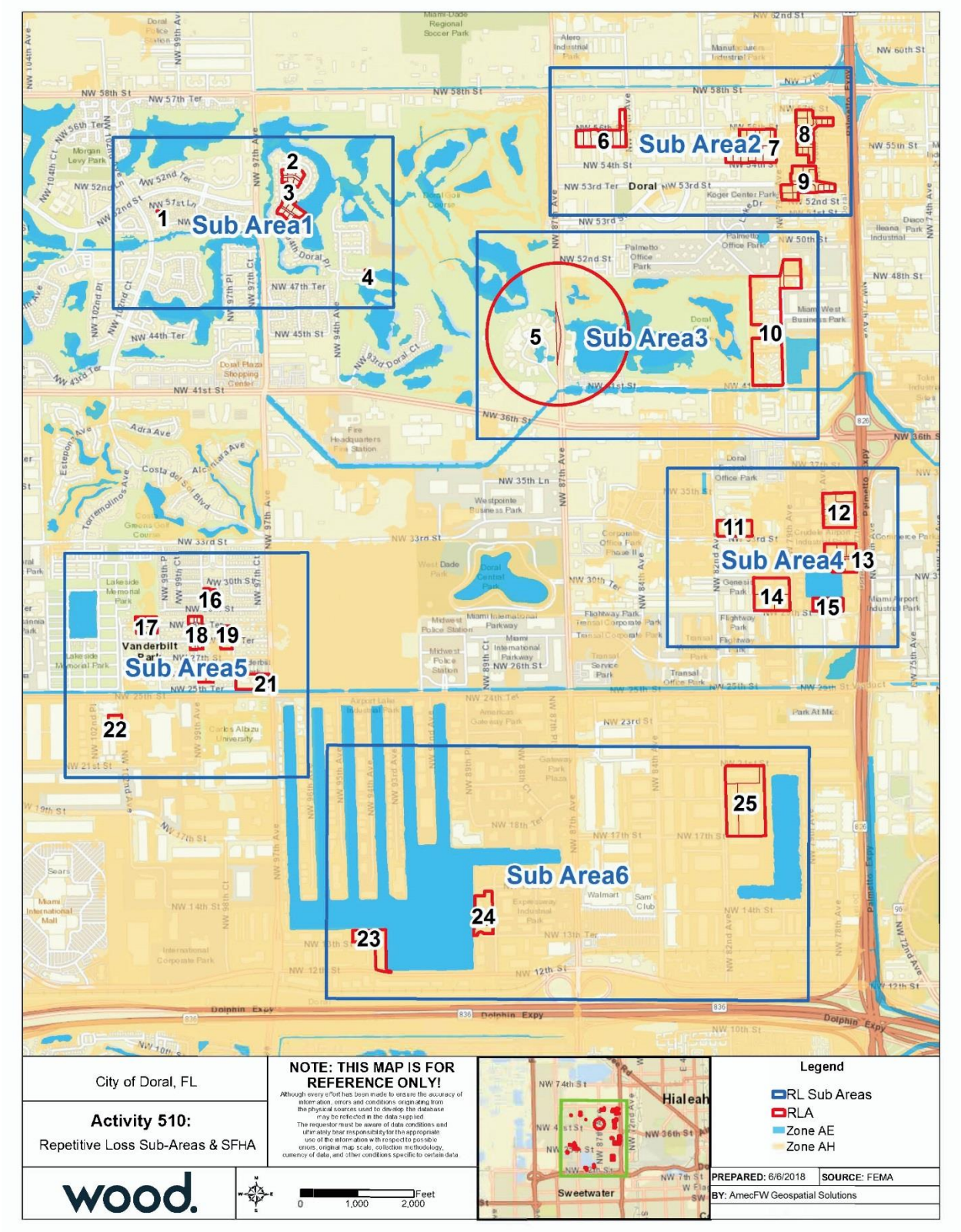


Figure 1.3 – City of Doral Repetitive Loss Areas and FEMA Flood Zones

2 The RLAA Process

The RLAA planning process incorporated requirements from Section 510 of the 2017 *CRS Coordinator's Manual*. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication *Reducing Damage from Localized Flooding: A Guide for Communities,* Part III Chapter 7; 2) CRS publication *Mapping Repetitive Loss Areas* dated August 15, 2008; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication *The Guidebook to Conducting Repetitive Loss Area Analyses*. Most specifically, this RLAA included all five planning steps included in the 2013 *CRS Coordinator's Manual*:

Step 1: Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2: Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3: Visit each building in the repetitive loss area and collect basic data.

Step 4: Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5 Document the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503.
2. The repetitive loss area must be mapped as described in Section 503.a. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

STEP 1. Advise All Property Owners

Before field work began on the RLAA, individual letters were mailed to property owners within the 25 identified Repetitive Loss Areas. Figure 2.1 on the following page shows an example of the property owner notification letter. Letters were mailed to repetitive loss properties, historical claims properties (those with one paid claim against the NFIP), and additional properties with similar flooding conditions but which have no claims paid against the NFIP. In total, 206 notification letters were mailed to property owners; 31 were returned as undeliverable. The letters were sent out on July 17, 2018. Copies of all mailed letters are maintained on file with the City of Doral Building Department. In accordance with the Privacy Act of 1974, the letters will not be shared with the general public.

Mailed Questionnaire

A property owner questionnaire was included with each letter mailed to building owners. The questionnaire asks about the type of foundation and if the building has a basement, if the building has experienced any flooding and the type of flooding, cause of flooding, flood protection measures and whether the owner has flood insurance. The Flood Protection Questionnaire is shown in Figures 2.2 and 2.3 on the following pages.

Website Announcement

The completed document will be made available for review on the City's website. This gives property owners an opportunity to review the general findings of the analysis and provide feedback to the City to further improve the City's and property owners' knowledge of flood issues.

[DATE]

[NAME]
[ADDRESS]
Doral, FL

Property Address: XXXXXX **Parcel Number: XXXXXXXXX**

Dear Property Owner:

As part of the City of Doral's participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS), the Building Department is evaluating properties that have experienced repetitive flood damage. This analysis will include the review of all previous flood data and studies conducted in these locations.

The repetitive loss analysis involves the collection of the following property level data elements:

- Building permit records (including application and associated records)
- Structure and site elevation information (elevation certificate if available)
- Tax ID and lot and parcel number
- Building property value on record (assessed value, replacement value or both)
- Land property value on record
- Building codes/floodplain development regulations exceeding minimum standards
- Historical flood event information (when events occurred, amount of damage to property, etc.)

In addition, the City of Doral and its contractor will visit each property to survey the flood risk and to take photographs. Property owners are encouraged to provide any relevant flooding information. The survey crews will be looking at the type and condition of the foundation, drainage patterns on the lot and whether outside mechanical equipment is elevated.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy of the report can be obtained from the Building Department or by calling (305) 593-6700 ext. 3111.

You can help us perform this analysis by **completing this questionnaire and returning to me** at **City of Doral Building Department, 8401 NW 53rd Terrace, Doral, FL 33166.** If you have any questions, please call me at (305) 593-6700 ext. 3111.

Sincerely,

Mark Hagerty
Floodplain Manager
City of Doral

Figure 2.1 – Example RLAA Property Notification Letter

CITY OF DORAL
FLOOD PROTECTION QUESTIONNAIRE

Name: _____

Property Address: _____

1. How many years have you occupied the building at this address?
   - ☐ Less than 1
   - ☐ 1-5 years
   - ☐ 5-10 years
   - ☐ 10+ years

2. Do you rent or own this building?
   - ☐ Rent
   - ☐ Own

3. What type of foundation does the building have?
   - ☐ Slab
   - ☐ Crawl Space
   - ☐ Basement
   - ☐ Other: _____

4. Has this **building** ever been flooded or had a water problem?
   - ☐ Yes
   - ☐ No

5. Has this **property** ever been flooded or had a water problem?
   - ☐ Yes
   - ☐ No – if no, skip to question 9.

6. In what year(s) did the building or property flood? _____

7. Where did you get water and how deep did it get?
   - ☐ In basement; Depth: _____
   - ☐ In crawl space; Depth: _____
   - ☐ Over 1st floor; Depth: _____
   - ☐ In yard; Depth: _____
   - ☐ Water was kept out of building by sandbagging, sewer valve, or other protective measure

8. What was the longest time that water stayed in the building or on the property? _____

9. What do you feel was the cause of your flooding? Check all that affect your building or property.
   - ☐ Storm sewer backup
   - ☐ Sanitary sewer backup
   - ☐ Standing water next to house/building
   - ☐ Drainage from nearby properties
   - ☐ Saturated ground / leaks in basement walls
   - ☐ Flooding from ditch/creek/river: _____
   - ☐ Other: _____

10. Have you taken any of these flood protection actions on the property?

	Yes	No
Installed sump pump		
Waterproofed the outside wall		
Re-graded yard to keep water away		
Moved things out of basement		

	Yes	No
Installed backup power system / generator		
Sandbagged		
Other:		

Page **1** of **2**

Figure 2.2 – RLAA Survey, Page 1

FLOOD PROTECTION QUESTIONNAIRE
(CONTINUED)

11. Which flood protection measures (checked in question 10) worked?

12. Is this building located in a FEMA floodplain?
    - ☐ Yes
    - ☐ No
    - ☐ I don't know

13. Do you have flood insurance for this building?
    - ☐ Yes
    - ☐ No
    - ☐ I don't know

14. Please include any additional information and comments you may have about flooding on this property or the surrounding area:

For more information on flood protection measures for your buildings or property, please contact Mark Hagerty, info below.

Please help us by completing this survey by August 31, 2018 and returning it to:

Mark Hagerty, Floodplain Manager
Government Center
8401 NW 53rd Terrace
Doral, FL 33166
(305) 593-6700 ext. 3111

Surveys can also be emailed to Mark.Hagerty@cityofdoral.com

Page **2** of **2**

Figure 2.3 – RLAA Survey, Page 2

Of the 185 delivered notification letters and questionnaires, the City of Doral received 6 responses which corresponds to a response rate of approximately 3.2 percent. The questionnaire responses are summarized below. Note: Respondents may have skipped questions and/or provided more than one response to a question.

Q1. How many years have you occupied the building at this address?

Answer Choices	Percentage	Number Responding
Less than 1	16.7%	1
1-5	0%	0
5-10	16.7%	1
10+	66.7%	4
Total		**6**

Q2: Do you rent or own this building?

Answer Choices	Percentage	Number Responding
Rent	0%	0
Own	100%	6
Total		**6**

Q3: What type of foundation does the building have?

Answer Choices	Percentage	Number Responding
Slab	75%	3
Crawl Space	25%	1
Basement	0%	0
Other	0%	0
Total		**4**

Q4: Has this building ever been flooded or had a water problem?

Answer Choices	Percentage	Number Responding
Yes	16.7%	1
No	83.3%	5
Total		**6**

Q5: Has this property ever been flooded or had a water problem?

Answer Choices	Percentage	Number Responding
Yes	16.7%	1
No	83.3%	5
Total		**6**

Q6: In what year(s) did the building or property flood?

- 2014 to 2018

Q6: Where did you get water and how deep did it get?

Answer Choices	Number Responding
In basement	0
In crawl space	0
Over 1st floor	0
In yard only	1
Water was kept out of house by sandbagging, sewer valve, or other protective measure	0
Total	**1**

Q7: What was the longest time that water stayed in the house/building?

- 2 days

Q8: What do you feel was the cause of your flooding? Check all that affect your home/building.

Answer Choices	Number Responding
Storm sewer backup	1
Sanitary sewer backup	0
Standing water next to house/building	1
Drainage from nearby properties	0
Saturated ground / leaks in basement walls	0
Flooding from ditch/creek/river: _____	0
Other	0
Total	**2**

Q9: Have you taken any of these flood protection actions on the property?

Answer Choices	Number Responding "Yes"
Installed sump pump	0
Waterproofed the outside walls	0
Re-graded yard to keep water away	0
Moved things out of basement	0
Installed backup power system / generator	0
Sandbagged	0
Other	1
None	0
Total	**1**

Other:

- We contacted a company to clean inside property drains

Q10: Did any of the measures checked in item 9 work? If so, which ones? If not, do you know why they did not work?

No responses

Q11: Is your home located in a Federal Emergency Management Agency (FEMA) floodplain?

Answer Choices	Percentage	Number Responding
Yes	0%	0
No	66.7%	4
I don't know	33.3%	2
Total		**6**

Q12: Do you have flood insurance?

Answer Choices	Percentage	Number Responding
Yes	50%	3
No	50%	3
I don't know	0%	0
Total		**6**

Q14: Please include any additional information and comments you may have about flooding in your area:

- Do not need flood insurance
- If it rains hard or very constant the street (29 St) gets flooded. The drain system is poor. 29 St and 99 Ave floods about one foot on heavy rain days.

The following trends in survey responses should be considered when evaluating mitigation measures:

- One third of respondents did not know whether their property was located in a FEMA floodplain.
- Only one respondent reported having experienced any flooding; therefore, little information was received on what property owners who have experienced flooding have done to mitigate their risk.
- One respondent considered storm sewer backup and standing water to be the cause of their flooding.
- Most respondents who knew their foundation type have a slab foundation, which suggests that building elevation may not be a viable, cost-effective solution for many properties in Doral.
- All responses received were from property owners. It is unclear how responses and trends may vary for renters.

STEP 2. Contact Agencies and Organizations

The City of Doral contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss areas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. Those reports which were analyzed and reviewed included:

- FEMA Flood Insurance Study, Miami-Dade County, Effective September 11, 2009
- Flood Insurance Claims Data
    - FEMA Community Information System Data
    - FEMA/ISO – Repetitive Loss and Flood Insurance Data
- City of Doral Comprehensive Plan, Updated 2016
- City of Doral Schedule of Capital Improvements, 2015/16-2019/20
- City of Doral Green Master Plan, 2008
- City of Doral Code of Ordinances
    - Flood Damage Prevention Ordinance
    - Zoning Ordinance
    - Subdivision Ordinance
- Miami-Dade County Comprehensive Development Master Plan
    - *Adopted 2020 and 2030 Land Use Plan Map, Updated January 2016*
    - *Parks Conservation and Vacant Land Map*
- Miami-Dade County Local Mitigation Strategy, January 2017

Summary of Studies and Reports

FEMA Flood Insurance Study, Effective September 11, 2009

FEMA's Effective FIS for Miami-Dade County, FL, including the City of Doral, is dated September 11, 2009. The FIS also includes revised Flood Insurance Rate Maps (FIRMs) released on the same date.

Flood Insurance Claims Data

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore, all claims data in this report are only discussed in general terms.

City of Doral Comprehensive Plan, 2016 Update

The City of Doral Comprehensive Plan sets the vision and goals for the City's development and identifies policies and objectives for achieving and measuring successful progress toward these goals. Among the many policy updates included in this plan update, the City shows commitment to effective stormwater management and flood reduction strategies. For example, the City committed to continuing to require at least 10% of all surface parking to be pervious and/or heat-resistant. The City also set an objective of completing a Low Impact Development Master Plan to encourages sustainable green design for stormwater management. Under infrastructure policies, the City established objectives and policies to prepare a floodplain management plan, maintain a stormwater master plan, prioritize stormwater management improvements through the Capital Improvements Program, and incorporate stormwater management minimum design criteria in the City's Code of Ordinances. Under conservation policies, the

plan establishes a policy to monitor construction in the SFHA and regulate if necessary to minimize potential losses.

City of Doral Schedule of Capital Improvements, 2016/17-2020/21

The Schedule of Capital Improvements is part of the City's updated Comprehensive Plan. For fiscal year 2016/17 through 2020/21, the plan allocates a total of $1,640,000 for stormwater drainage improvements throughout the City. Each year, the plan will identify specific projects or sites to be addressed with this funding on a priority ranking. The funding for these projects will come from the City's Stormwater Fund.

City of Doral Green Master Plan, 2008

Doral's Green Master Plan is intended to "conserve natural resources, enhance quality of life, bolster economic vitality, and leave a sustainable legacy to future generations of City residents." Among the action strategies in the plan are efforts to implement low-impact development (LID) and minimize impervious surfaces.

City of Doral Code of Ordinances

Ordinance No. 2015—01 of the City of Doral Code of Ordinances establishes provisions for flood hazard reduction. Specific standards include requiring that new construction be elevated to one foot above the base flood elevation and that enclosures below the lowest floor not be used for living space. Additionally, the ordinance establishes thresholds for cumulative substantial improvements and damages, to encourage property owners to bring flood-prone buildings up to code requirements. The ordinance also requires real estate disclosure of flood hazards to prospective buyers.

The City of Doral enforces local drainage protection in the non-SFHA areas through enforcement of the Florida Building Code to better protect buildings from low level flooding and stormwater issues.

The City of Doral's zoning ordinance guides growth and development in the City. The zoning ordinance does not currently designate any zones as open space for flood protection purposes.

The City's subdivision ordinance sets criteria for drainage that must be met in order for a development to be approved. Drainage must be managed in accordance with the County Water-Control Plan, and development must be elevated in accordance with the flood criteria map.

Miami-Dade County Comprehensive Development Master Plan (CDMP), updated January 2016

The Miami-Dade County CDMP sets goals, objectives, and policies for the development and conservation of land and natural resources over the next 10 to 20 years. The 2020 and 2030 Land Use Map illustrates the general land use categories planned throughout the County and shows the expected expansion of the County's Urban Development Boundary, setting a growth strategy.

Miami-Dade County Local Mitigation Strategy, January 2017

The Miami-Dade Local Mitigation Strategy (LMS) is a multi-hazard mitigation plan for the county. The plan devotes a chapter to flooding, the NFIP, and the CRS, which assesses the flood hazard risk and vulnerability throughout the county and identifies mitigation projects that have been and/or can be implemented.

STEP 3. Building Data Collection

The on-site field survey for this analysis was conducted on July 25th and 26th, 2018 and November 26th through 28th, 2018. The National Tool Limited View was not utilized in this effort, but most of the information required by the National Tool was incorporated into a mobile application survey. The data collection forms generated by the mobile application are included in Appendix A. (Note: In accordance with the Privacy Act of 1974, Appendix A will not be shared with the general public).

In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

- Existing mitigation observed
- Type and condition of the structure and foundation
- Number of stories
- Height above street grade and height above site grade
- Presence and type of appurtenant structures
- Likely areas and severity of damage on property
- Presence of any HVAC units that would be vulnerable

Data was also gathered, when possible, through conversations with property owners and/or residents. These conversations provided detail on the extent of flooding, potential causes of flooding, and recollections from past flood events, which help to better understand flooding issues for these areas.

Data was also incorporated from off-site research, including a review of FEMA Flood Insurance Rate Maps and the location of the Repetitive Loss Areas in relation to FEMA flood zones.

Table 2.1 on the following page details the percentage of each repetitive loss area that falls within the 100-year or Unshaded Zone X flood zone.

Table 2.1 – Repetitive Loss Area Percentage by Flood Zone

Repetitive Loss Area	Total Acreage	Percentage of Area		
		Zone AE 100-yr	Zone AH 100-yr	Zone X Unshaded
1	0.50			100.0
2	2.18			100.0
3	2.97	6.6		93.4
4	0.43			100.0
5	114.09	25.4	3.8	70.8
6	6.76		5.6	94.4
7	10.21		20.2	79.8
8	7.01		100.0	
9	7.43		90.2	9.8
10	26.00		45.2	54.8
11	3.99		94.7	5.4
12	7.92		100.0	
13	6.19		100.0	
14	8.44		81.4	18.6
15	2.81		36.0	64.0
16	1.47			100.0
17	2.48		34.1	66.0
18	2.95			100.0
19	1.66		84.1	16.0
20	1.40			100.0
21	3.70			100.0
22	2.30		36.7	63.4
23	5.13	0.5	99.5	
24	5.18		100.0	
25	19.54		100.0	

Source: FEMA 9/11/2009 FIRM, Miami-Dade County GIS Parcel Data

Problem Statement: Stormwater/Localized Flooding

All 25 identified Repetitive Loss Areas in the City of Doral are located in areas vulnerable primarily to stormwater and urbanized localized flooding. The City of Doral's flat topography and dependence on a network of regional drainage features makes it susceptible to stormwater flooding.

In these areas, the majority of flooding occurs from heavy rain events. Stormwater flooding can occur as a result of prolonged periods of rain that saturate the ground and eventually overwhelm the drainage system. Some flooding in these repetitive loss areas is also considered flash flooding, which can occur when a large amount of rain falls in a short amount of time and the capacity of the stormwater system is exceeded and/or conveyance is obstructed by debris, sediment, and other materials that limit the volume of drainage. Flooding can result from clogged inlets preventing conveyance into the stormwater system or clogged outlets that prevent drainage out of the system. All of these problems are compounded with the high water table in South Florida.

Many losses have occurred in these areas as a result of hurricanes and tropical storms. Among the hurricanes and tropical storms that have resulting in flood insurance claims in the City of Doral are Hurricane Irene in 1999 and Tropical Storm Leslie in 2000.

The approach to reducing repetitive flooding in these areas will require a combination of floodproofing techniques, education, and drainage improvement projects.

Subarea 1

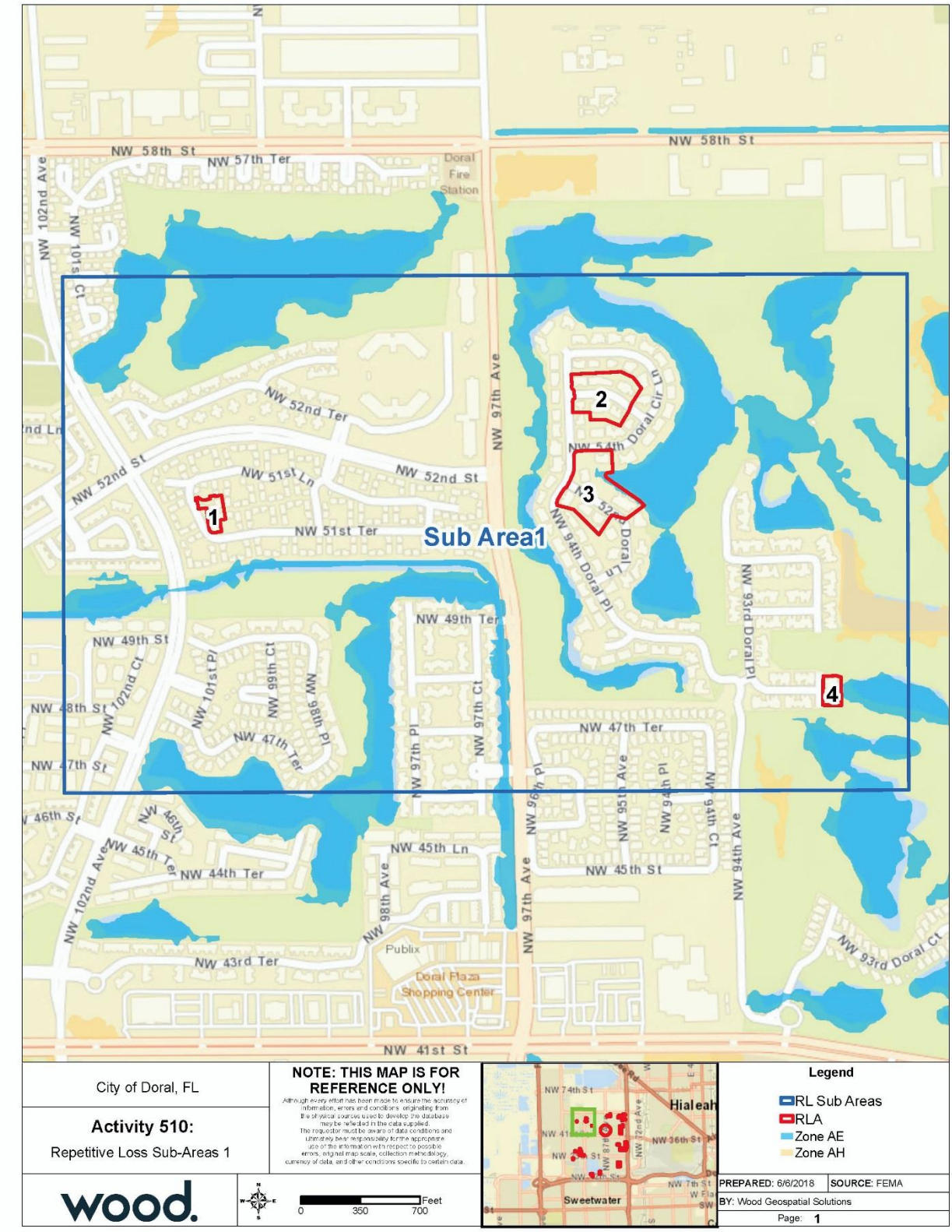


Figure 2.4 – Repetitive Loss Subarea 1

Repetitive Loss Area 1 is located completely outside the 100-yr floodplain in the unshaded Zone X. The area is just north of Dressel's Dairy Canal, which is surrounded by areas of the floodplain in Zone AE. The area is residential and located on a private drive in a gated community. The houses are masonry with slab on grade foundations; most are elevated on minimal fill to between 0 and 2 feet above grade, but one house is at grade. All six houses were built in the late 1980s. A few of the houses lack guttering. None of the HVAC units were visible from the right of way.

Repetitive Loss Area 2 is located completely outside the 100-yr floodplain in the unshaded Zone X. The area is in the middle of a residential development that is surrounded by a retention pond. The area is residential and located on a private drive in a gated community. The houses are masonry with slab on grade foundations; most are elevated on minimal fill to between 1 and 2 feet above grade, but one house is at grade. All six houses were built in the early to mid-1980s. HVAC units were not visible from the right of way. Most of the houses are 2-story buildings and have guttering; however, some of the down spouts outlet directly onto the driveway or sidewalk.

Repetitive Loss Area 3 is located almost entirely outside the 100-yr floodplain in the unshaded Zone X. The area sits along a retention pond and contains small portions of the floodplain in Zone AE adjacent to the pond. The area is residential and located on private roads in a gated community. The structures are masonry with slab on grade foundations. One structure was elevated between 2 and 3 feet above grade but did not have flood vents. Some homes did not have guttering. No HVAC systems were observable. Two of the properties in this area are vacant lots, and one property is a house currently under construction.

Repetitive Loss Area 4 is located completely outside the 100-yr floodplain in the unshaded Zone X but is directly adjacent to a retention pond within the floodplain in Zone AE. The area is residential and located on a private drive in a gated community. The buildings are masonry with slab on grade foundations. All were built in 1982. The buildings are all elevated slightly above grade and all have guttering. One HVAC system could be seen to be elevated to the first-floor elevation.

Table 2.2 – Repetitive Loss Area Overview for Subarea 1

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	1	0	5	6	NW 101st Pl
2	1	0	5	6	NW 54th Doral Ter, NW 94th Doral Pl
3	1	0	7	8	NW 94th Doral Pl, NW 52nd Doral Ln, NW 54th Doral Cir Ln
4	1	0	3	4	NW 93rd Doral Ct
Total	**4**	**0**	**20**	**24**	

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.

Subarea 1 contains a total of 24 properties including 2 vacant lots discovered during the field survey.

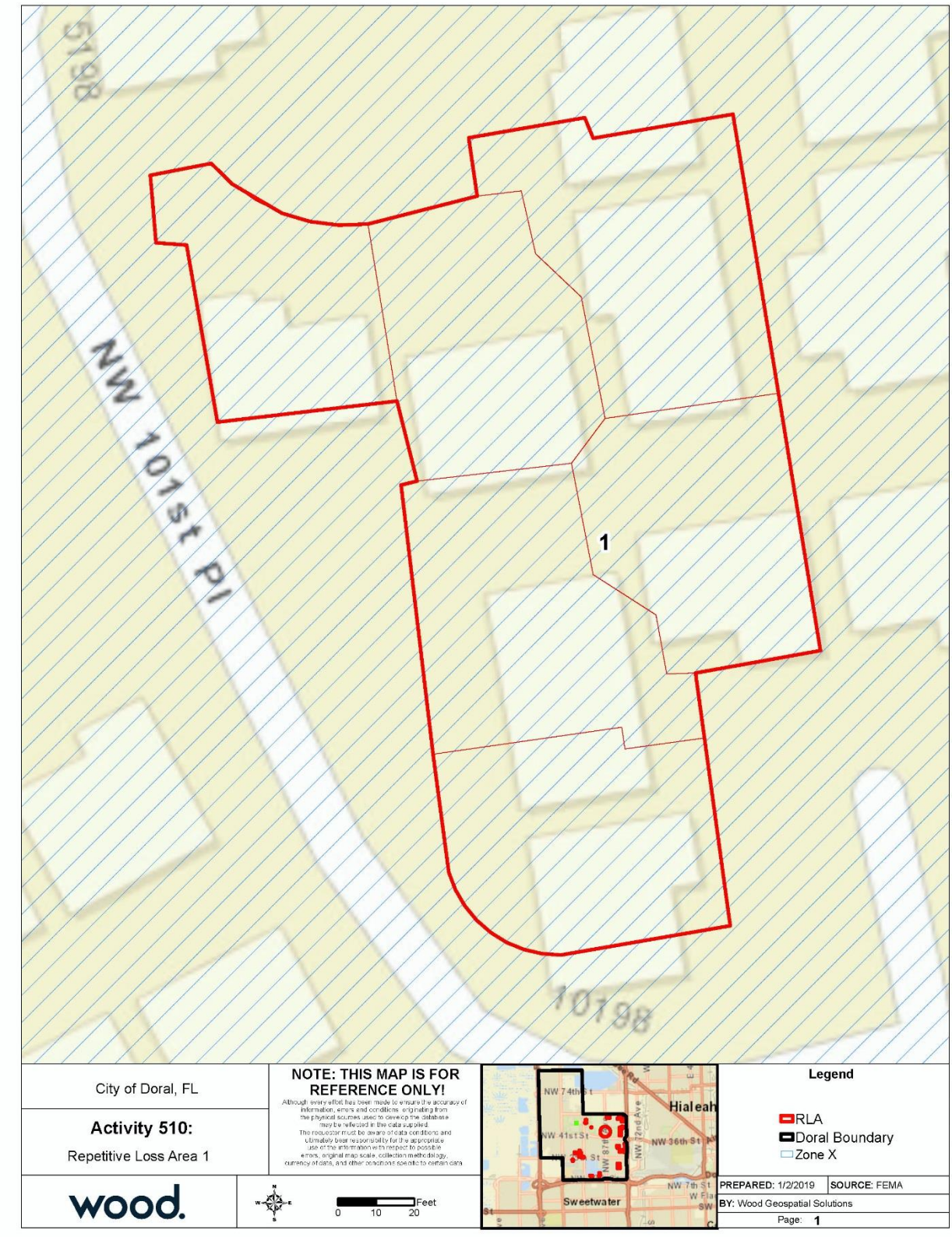


Figure 2.5 – Repetitive Loss Area 1

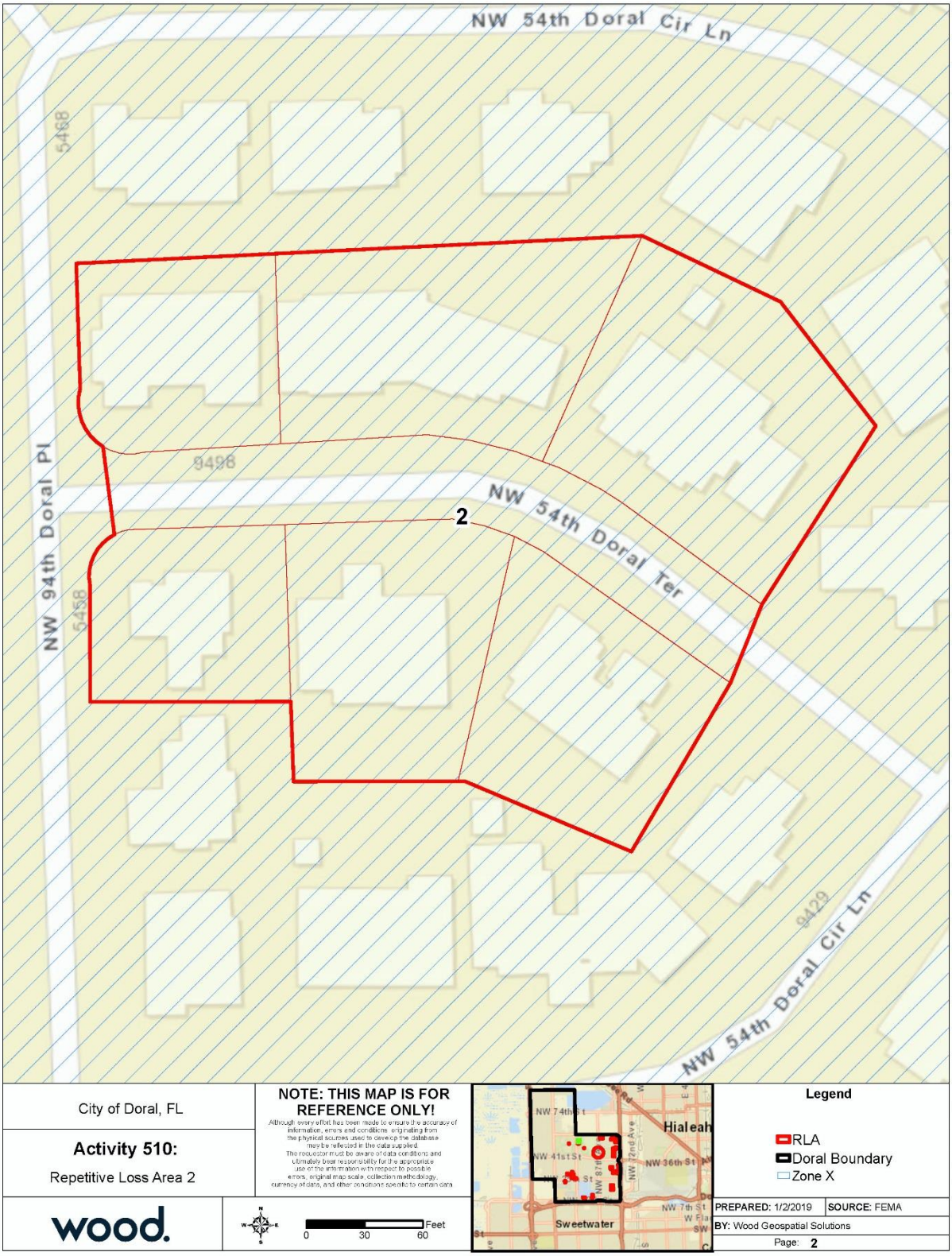


Figure 2.6 – Repetitive Loss Area 2

Figure 2.7 – Repetitive Loss Area 3

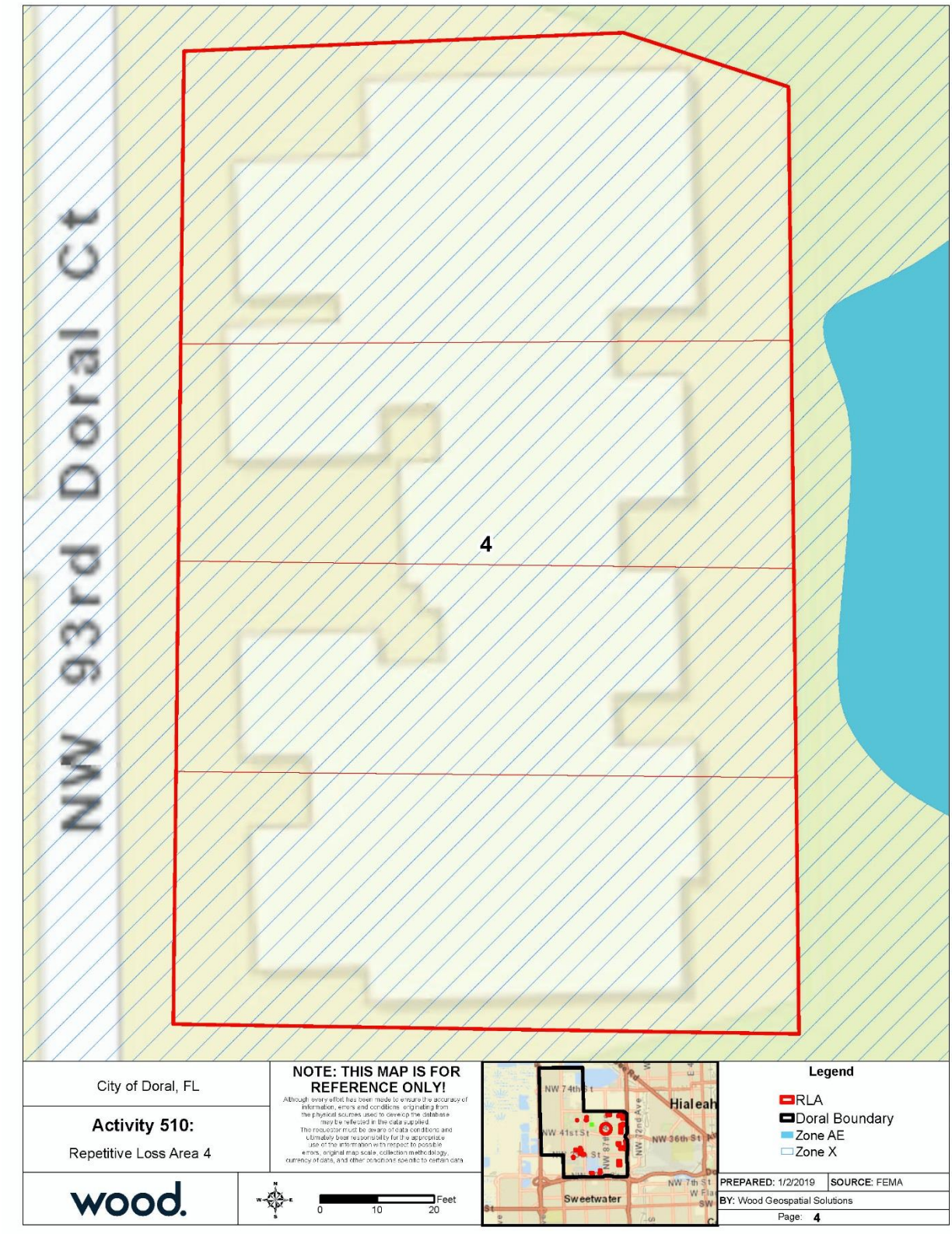


Figure 2.8 – Repetitive Loss Area 4

Example Properties in Subarea 1

Repetitive Loss Area 1 – Property elevated slightly above grade

Repetitive Loss Area 2 – Drainage inlet on corner of block; curb may block entry of water

Repetitive Loss Area 3 – Clogged drainage inlet

Repetitive Loss Area 4 – House with elevated HVAC and full guttering

Subarea 2

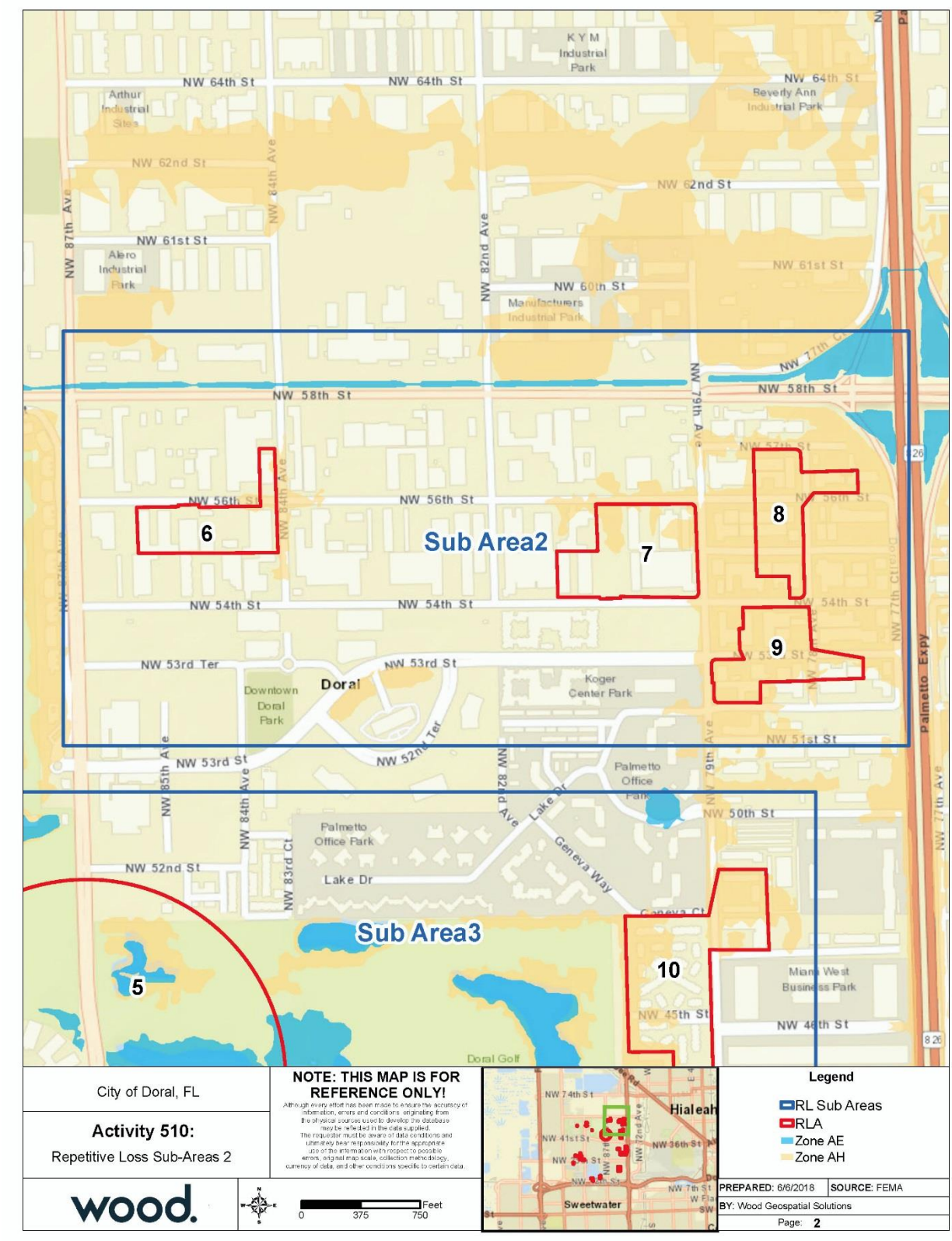


Figure 2.9 - Repetitive Loss Subarea 2

Repetitive Loss Area 6 is located almost entirely outside the 100-yr floodplain in the unshaded Zone X but contains portion of Zone AH along the intersection of NW 56th Street and NW 84th Avenue. This area sits just south of a canal that runs along NW 58th Street. The area is industrial with mostly concrete buildings and slab on grade foundations. Several buildings are elevated several feet above grade on fill. One building sits below grade and may flood as a result. Another building is situated such that the parking lot slopes to the building. All HVAC units were observed to be elevated either to or above the first floor. Some ponding was seen in parking lots and near doors.

Repetitive Loss Area 7 is located partly outside the floodplain in unshaded Zone X but contains portions of the Zone AH of the floodplain along NW 56th Street and NW 79th Avenue. The area is industrial with concrete and masonry structures and slab on grade foundation types. Several structures were elevated on fill, but two buildings were at grade, and of these, one had noticeable foundation issues. Several buildings had parking lots that sloped toward the building or that had noted ponding near the building. Two buildings had drainage inlets nearby. All observable HVAC units were elevated above the first-floor elevation. One parcel was discovered to be vacant and used as a storage lot for old buses.

Repetitive Loss Area 8 is located completely within the 100-yr floodplain in Zone AH. The area is industrial with concrete structures and slab on grade foundations. Several of the structures and foundations are in poor condition. Most of the buildings are elevated at least slightly above grade, however two structures sit at grade. Several buildings have drainage inlets in their driveways or in front of the building. Most HVAC systems were visible and were elevated above the first-floor elevation.

Repetitive Loss Area 9 is located almost entirely within the 100-yr floodplain in the Zone AH, except for a small area in the southeast that is outside the floodplain in the unshaded Zone X. The area is primarily industrial with a couple commercial buildings mixed in. The buildings are mostly concrete with slab on grade foundations. Most structures were at grade or slightly above grade. One building has a parking lot that slopes toward the foundation. One property was discovered to be a vacant lot used for truck storage. Only a few HVAC units were observable, but most of these were elevated above the first-floor elevation. One HVAC system was seen at grade.

Table 2.3 – Repetitive Loss Area Overview for Subarea 6

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
6	3	0	5	8	NW 56th St, NW 84th Ave
7	3	0	8	11	NW 54th St, NW 56th St, NW 79th Ave
8	8	0	8	16	NW 55th St, NW 56th St, NW 57th St, NW 78th Ave
9	4	0	10	14	NW 52nd St, NW 53rd St, NW 54th St, NW 78th Ave, NW 79th Ave
Total	**18**	**0**	**31**	**49**	

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.

Subarea 6 contains a total of 49 properties including 2 vacant lots discovered during field survey.

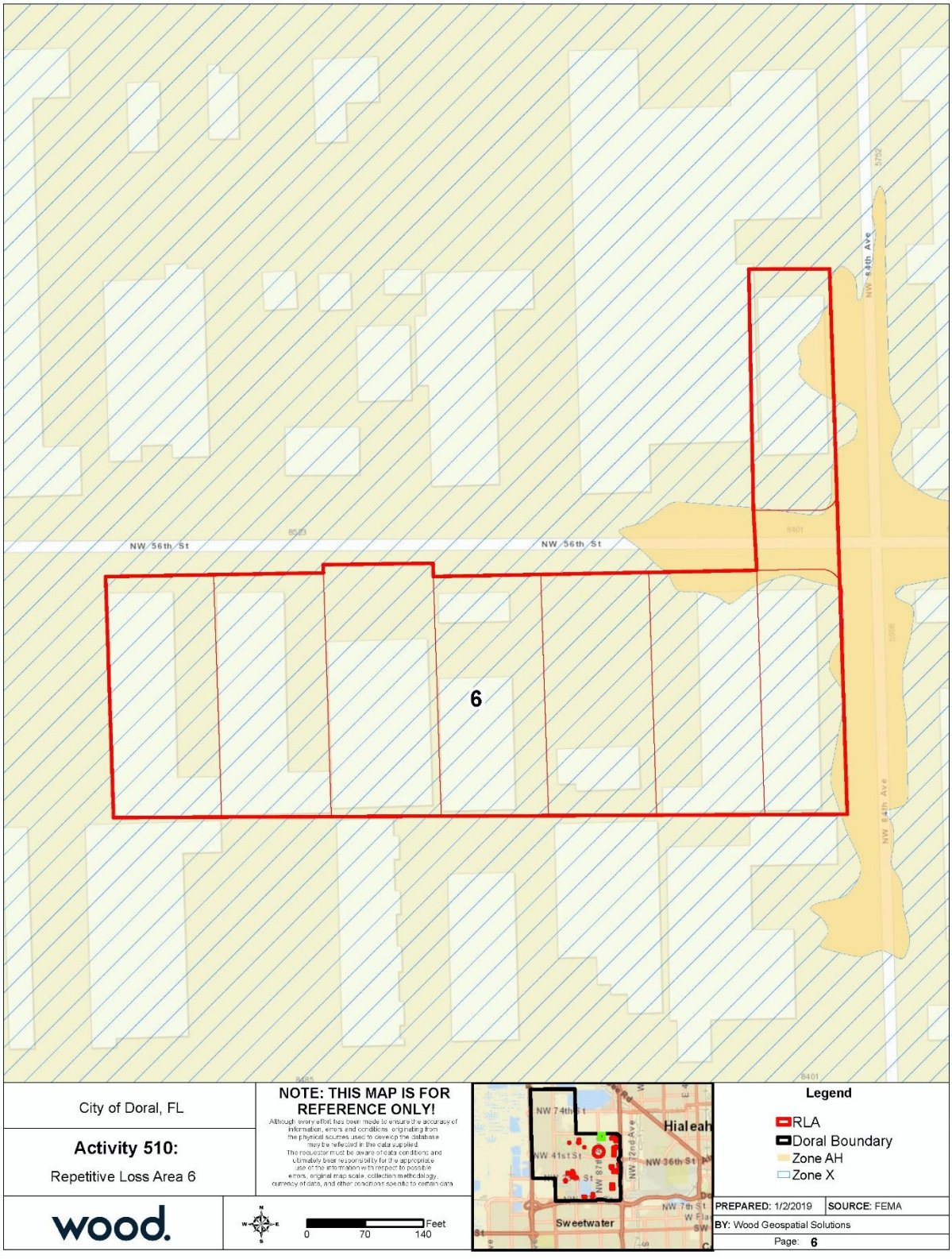


Figure 2.10 – Repetitive Loss Area 6

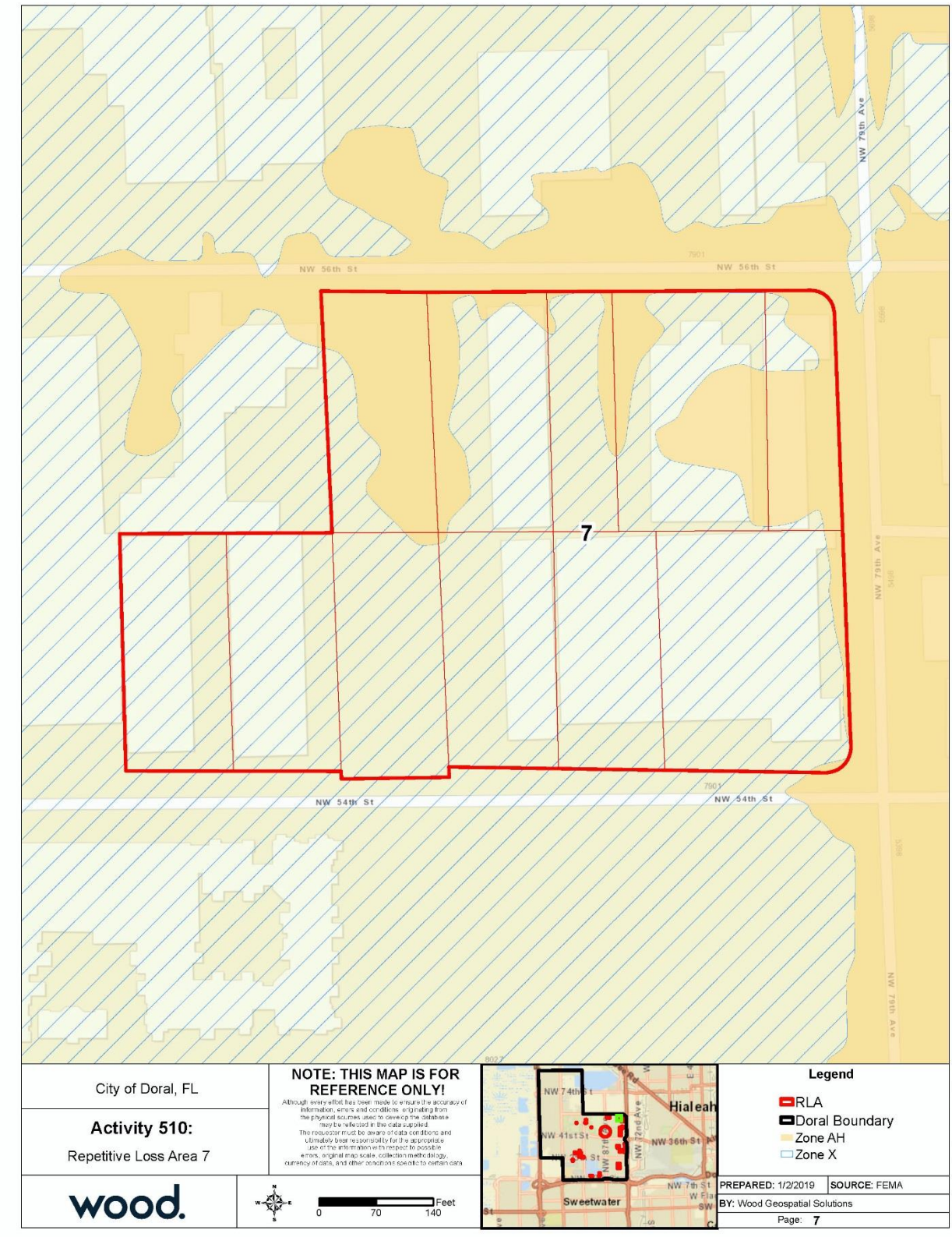


Figure 2.11 – Repetitive Loss Area 7

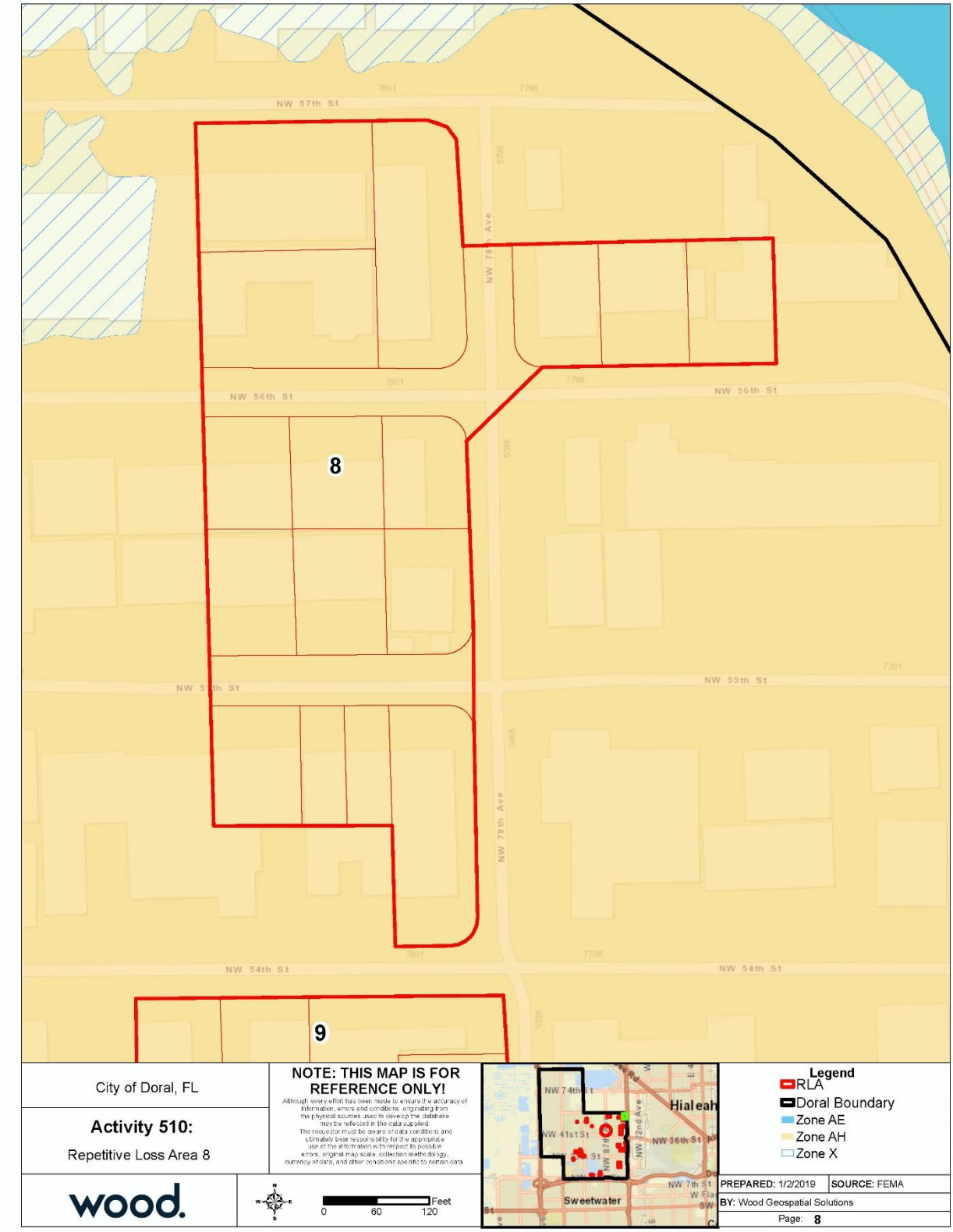


Figure 2.12 – Repetitive Loss Area 8

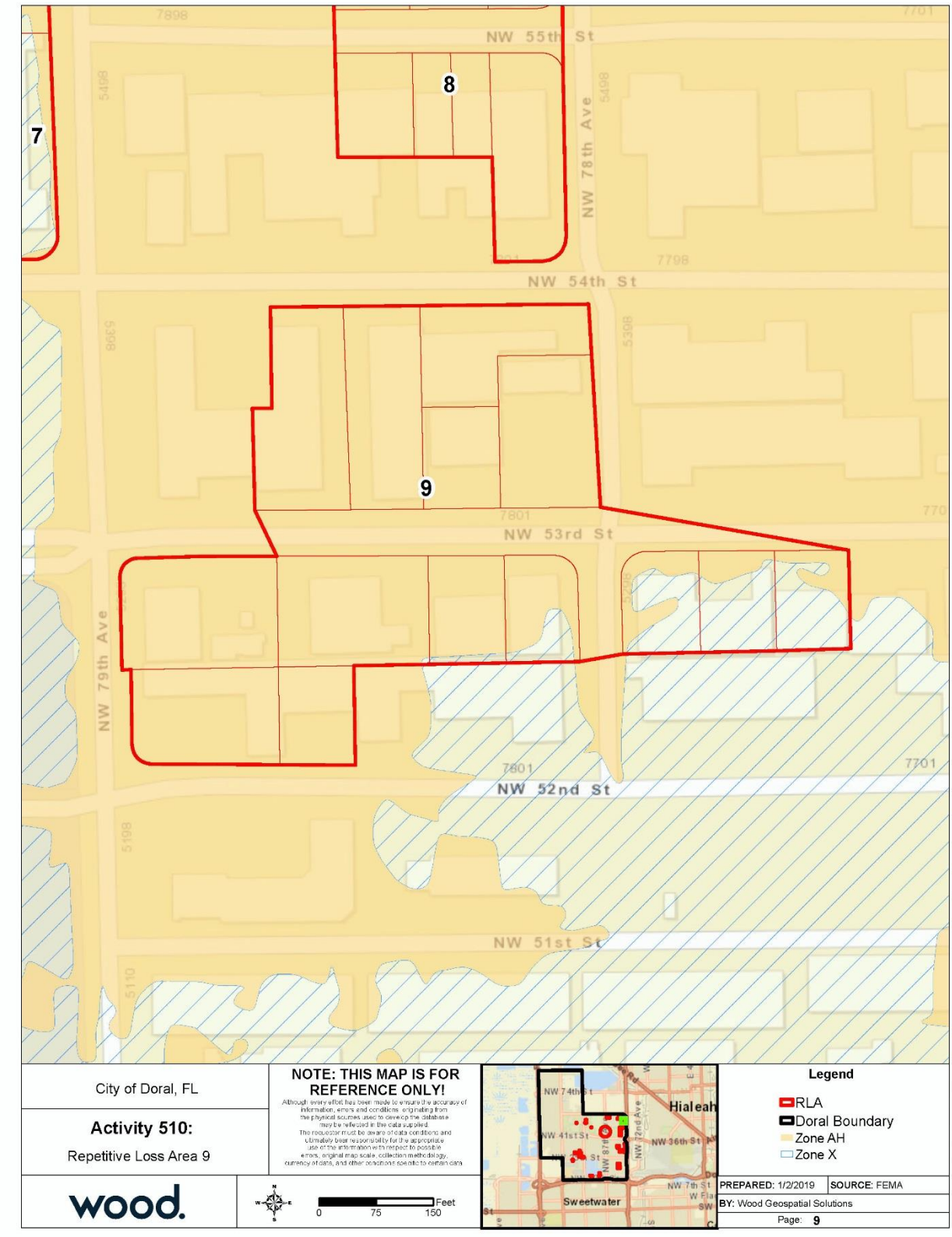
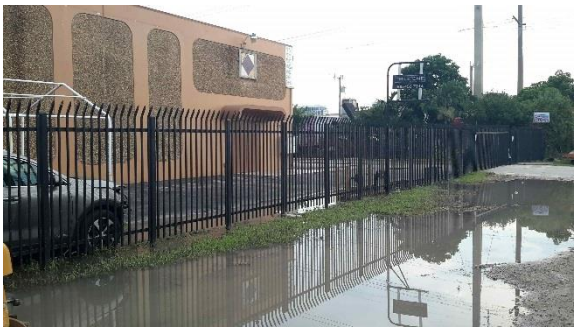


Figure 2.13 – Repetitive Loss Area 9

Example Properties in Subarea 2

Repetitive Loss Area 6 – Elevated HVAC unit



Repetitive Loss Area 7 – Water ponded in parking lot

Repetitive Loss Area 8 – Water ponding in lot and not reaching drainage inlet

Repetitive Loss Area 9 – Building interior elevated with warehouse/garage area still at grade

Subarea 3

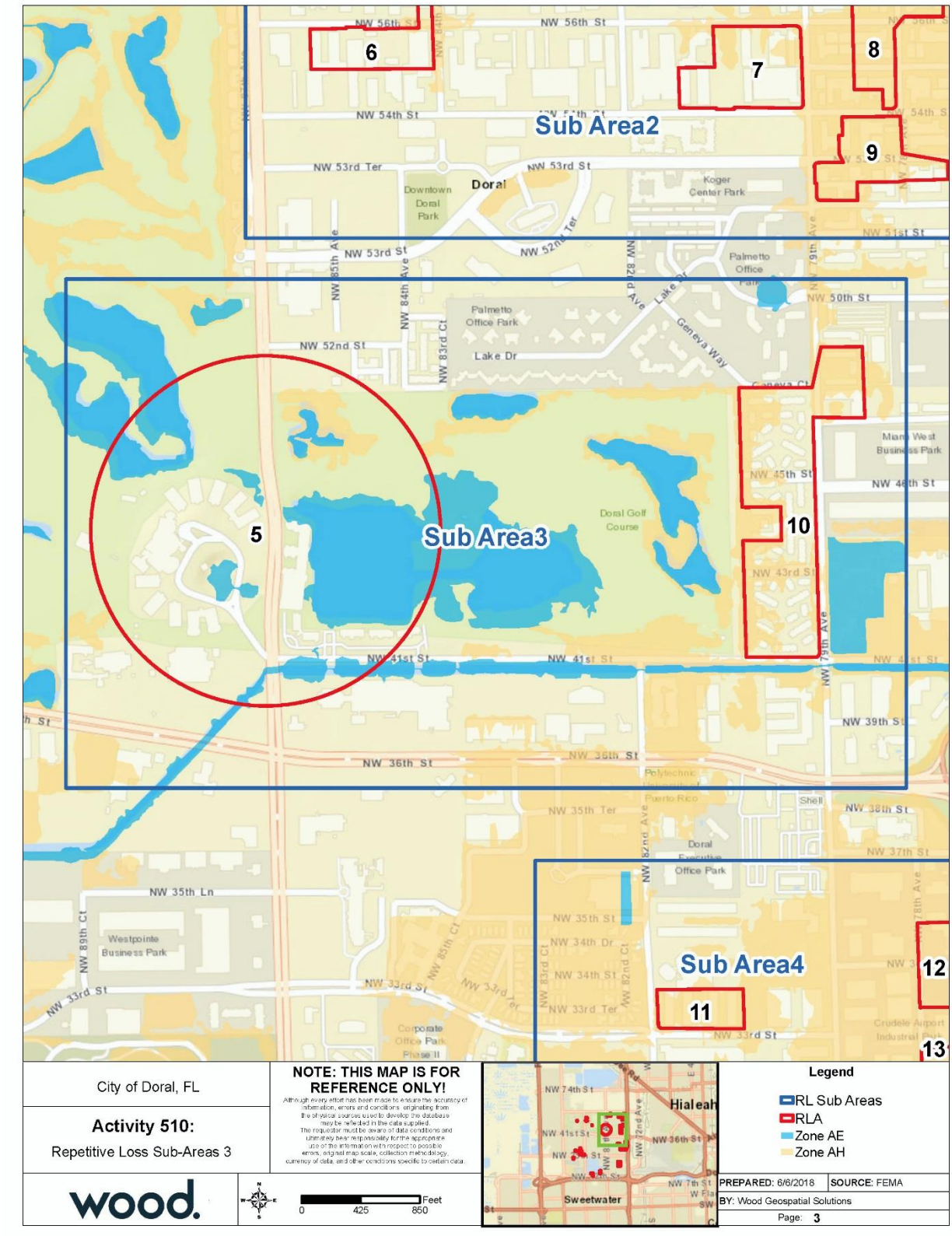


Figure 2.14 – Repetitive Loss Subarea 3

Repetitive Loss Area 5 is located primarily outside the 100-yr floodplain but contains portions of Zone AH and Zone AE. This Repetitive Loss Area sits along NW 87th Avenue. The property was not accessible for a site visit. However, additional research suggests that flood issues are caused by a canal which is partially piped and runs through the property. The area contains commercial property. No additional structure details could be determined from off-site assessment.

Repetitive Loss Area 10 is located partially within the 100-yr floodplain and partly in the Unshaded Zone X. This area sits along NW 79th Avenue, and losses are likely due to drainage issues on this road. The area is a mix of commercial and residential buildings. All structures are masonry with slab-on-grade foundations. All buildings are at grade and it was observed that if water were in the parking lots it could easily enter the buildings. One portion of this area is a mixed-residential development with identical buildings. There is a slight grade across the entire property, and water could easily drain from the parking areas into the lower levels of buildings. None of these buildings have guttering. HVAC units were not observable for these residential properties. The HVAC unit for one commercial building was seen to be elevated above the first floor. One property was found upon visiting to be a vacant parking lot.

Table 2.4 – Repetitive Loss Area Overview for Subarea 3

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
5	1	0	0	1	NW 87th Ave
10	18	0	41	59	NW 79th Ave
Total	**19**	**0**	**41**	**60**	

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.

Subarea 3 contains a total of 60 properties including 1 vacant lot discovered during the field survey.

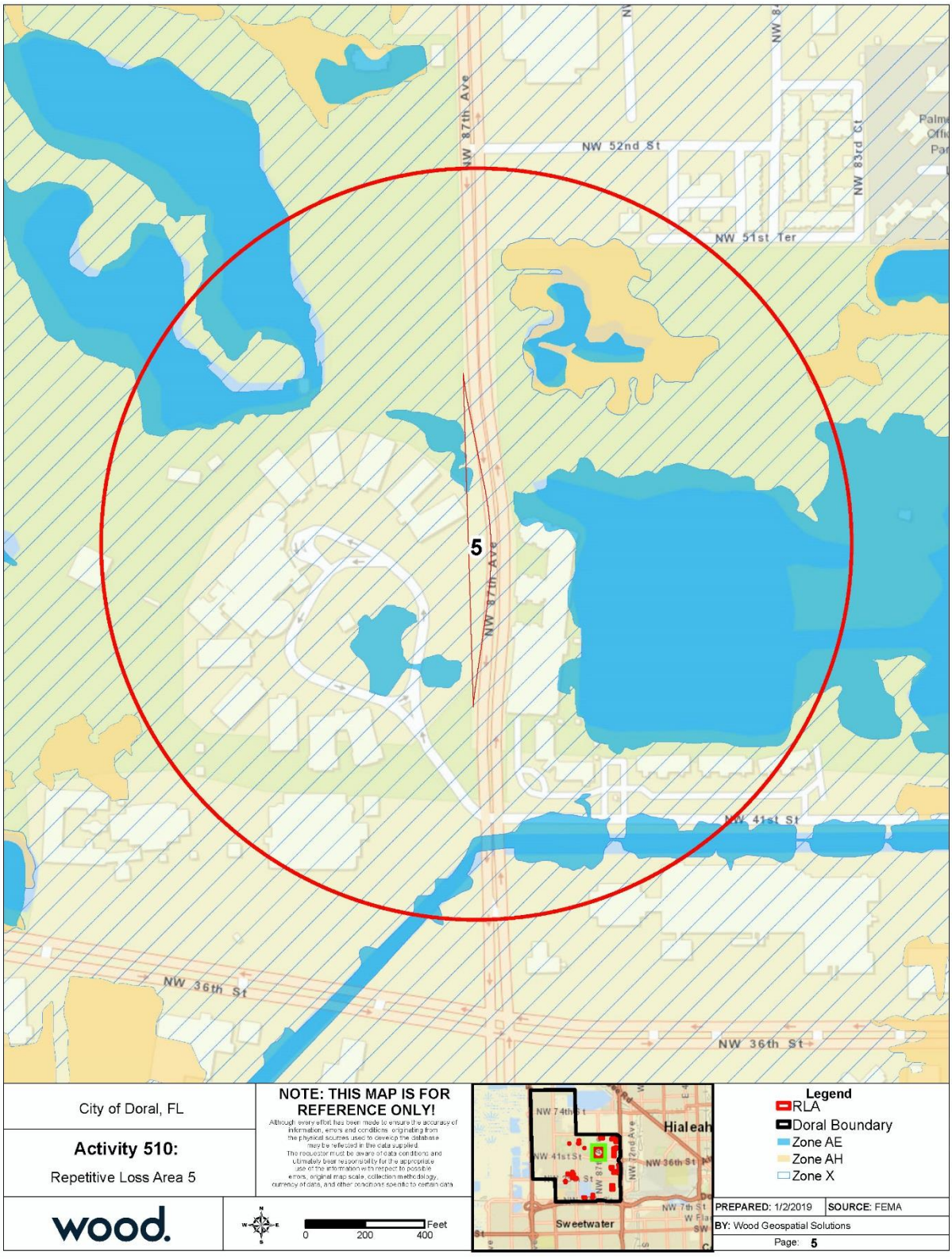


Figure 2.15 – Repetitive Loss Area 5

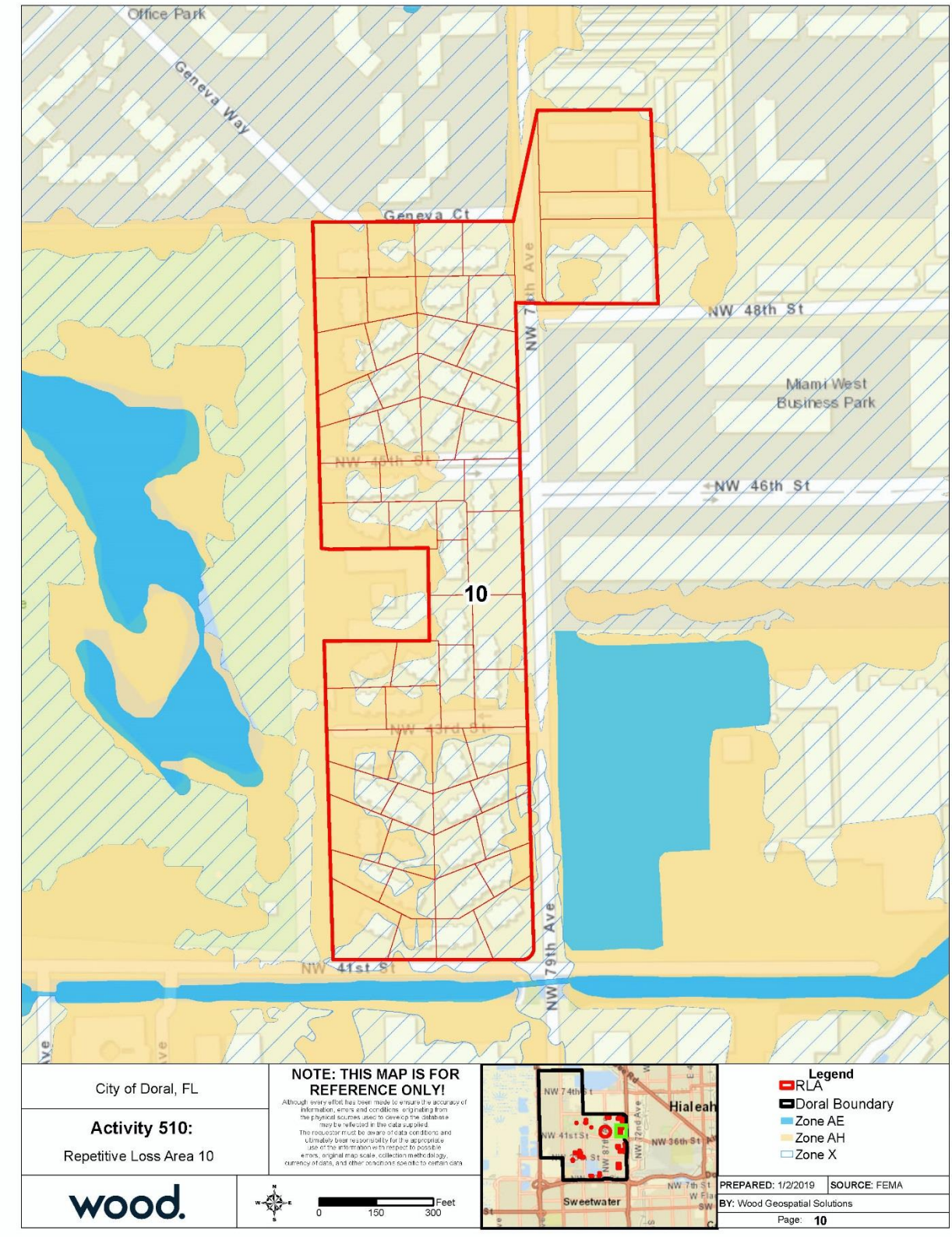


Figure 2.16 – Repetitive Loss Area 10

Example Properties in Subarea 3

Repetitive Loss Area 10 – Building at grade; water could enter easily from parking lot

Repetitive Loss Area 10 – Buildings at grade; no guttering

Subarea 4

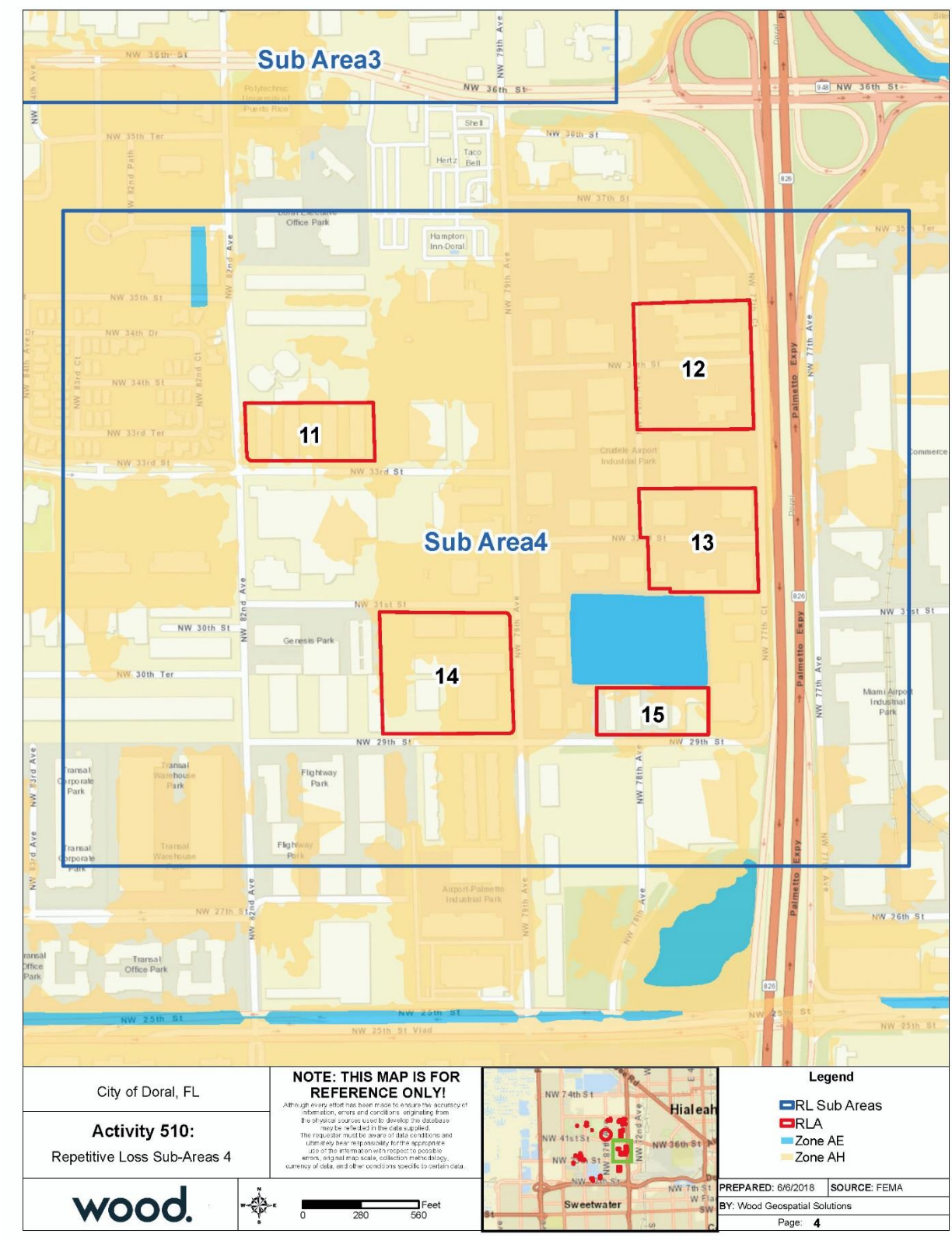


Figure 2.17 – Repetitive Loss Subarea 4

Repetitive Loss Area 11 is located almost completely within the 100-yr floodplain in Zone AH with some area in the Unshaded Zone X. The area is commercial with masonry buildings and slab on grade foundation types. Most buildings are at grade and one sits well below grade. Another building has a below grade delivery access that is used for truck deliveries; this area could fill with water during heavy rains. All buildings are vulnerable to water entering from their lots during heavy rains. A few HVAC units were observed to be elevated above the first floor.

Repetitive Loss Area 12 is located completely within the 100-yr floodplain in Zone AH. The area is commercial and industrial with masonry and steel buildings and slab on grade foundation types. Structures are at or slightly above grade, but lots slope toward the buildings. HVAC systems were not observable. Two lots had standing water; one was equipped with a pump to drain the parking lot.

Repetitive Loss Area 13 is located completely within the 100-yr floodplain in Zone AH. The area is adjacent to a stormwater retention pond. The area is industrial with masonry buildings and slab on grade foundation types. Most buildings were elevated above grade, but several had warehouse spaces that were at or below grade. On one property the road and parking lot slope toward the building. Several HVAC units were observed to be elevated above the first floor. One property was discovered to be a vacant lot.

Repetitive Loss Area 14 is located almost completed within the 100-yr floodplain. The area is industrial with masonry buildings and slab on grade foundations. On several properties the parking lot could be seen to slope toward the building. One HVAC unit was observed to be elevated above the first floor. One property in this area is a repetitive loss building that has since been mitigated through flood protection.

Repetitive Loss Area 15 is located almost entirely outside the 100-yr floodplain in the unshaded Zone X but with a small portion in Zone AH. The area is adjacent to a stormwater retention pond. The area is industrial with masonry buildings and slab on grade foundations. All buildings were elevated at least slightly above grade. On two properties the parking lot could be seen to slope toward the building. One HVAC unit was observed to be elevated above the first floor.

Table 2.5 – Repetitive Loss Area Overview for Subarea 4

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
11	4	0	20	24	NW 33rd St, NW 82nd Ave
12	2	0	1	3	NW 34th St, NW 77th Ct
13	1	2	5	8	NW 32nd St, NW 77th Ct
14	3	0	4	7	NW 29th St, NW 79th Ave
15	1	0	2	3	NW 29th Ave
Total	**11**	**2**	**32**	**45**	

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.

*Historical claims occurred in the same buildings where repetitive losses occurred; however multiple addresses are located in one building. During field survey each building was evaluated as a whole.

Subarea 4 contains a total of 45 properties including 1 vacant lot discovered during the field survey.

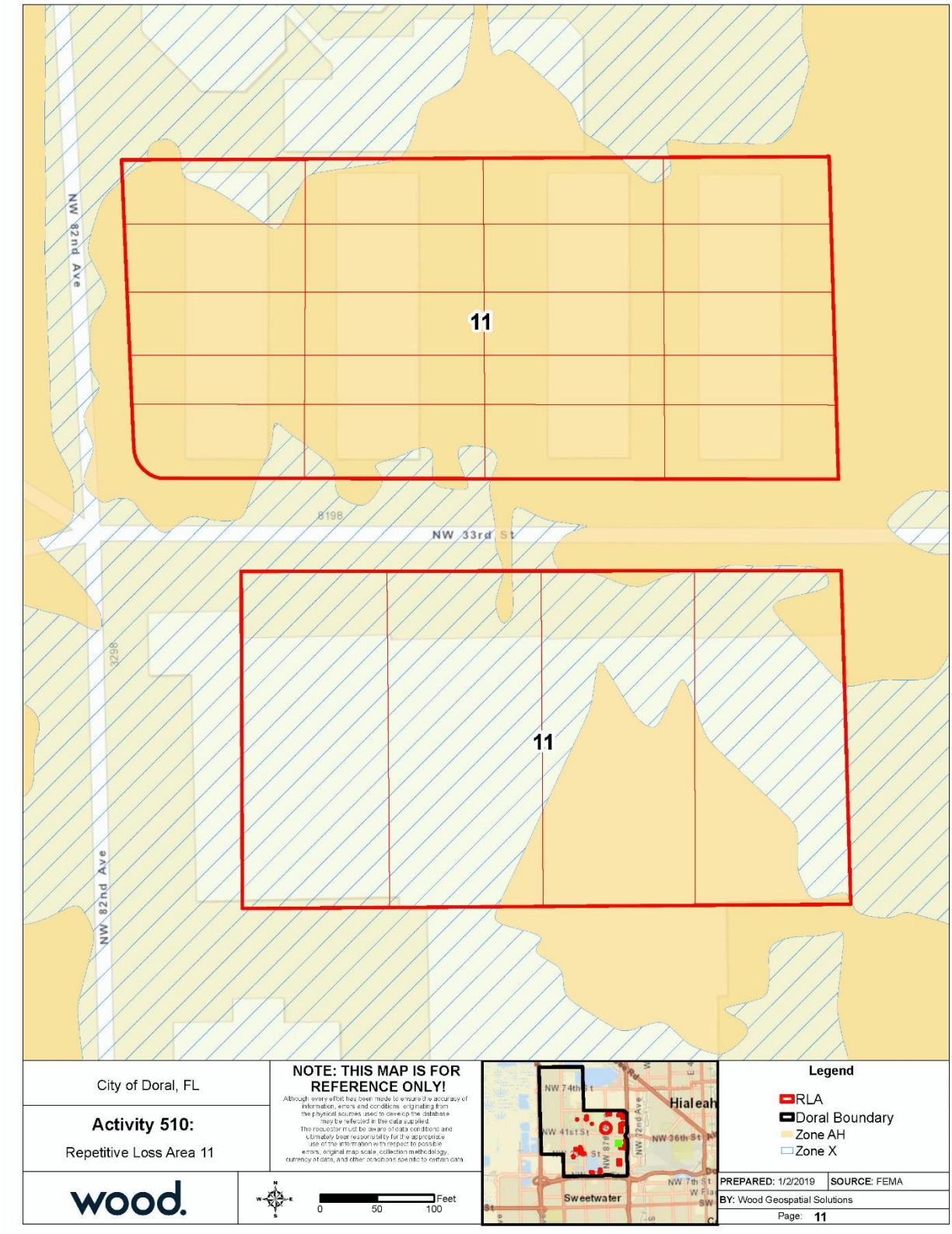


Figure 2.18 – Repetitive Loss Area 11

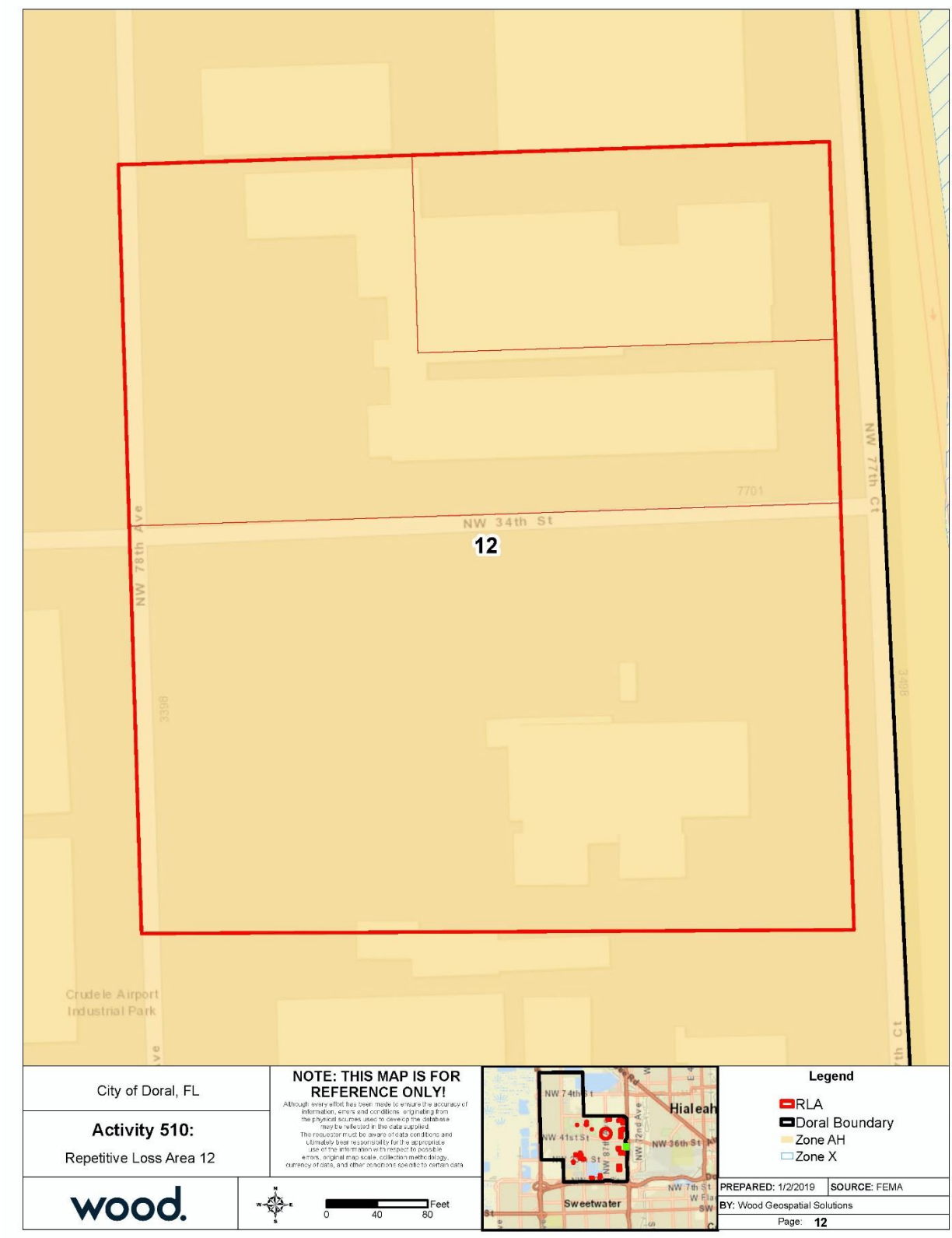


Figure 2.19 – Repetitive Loss Area 12

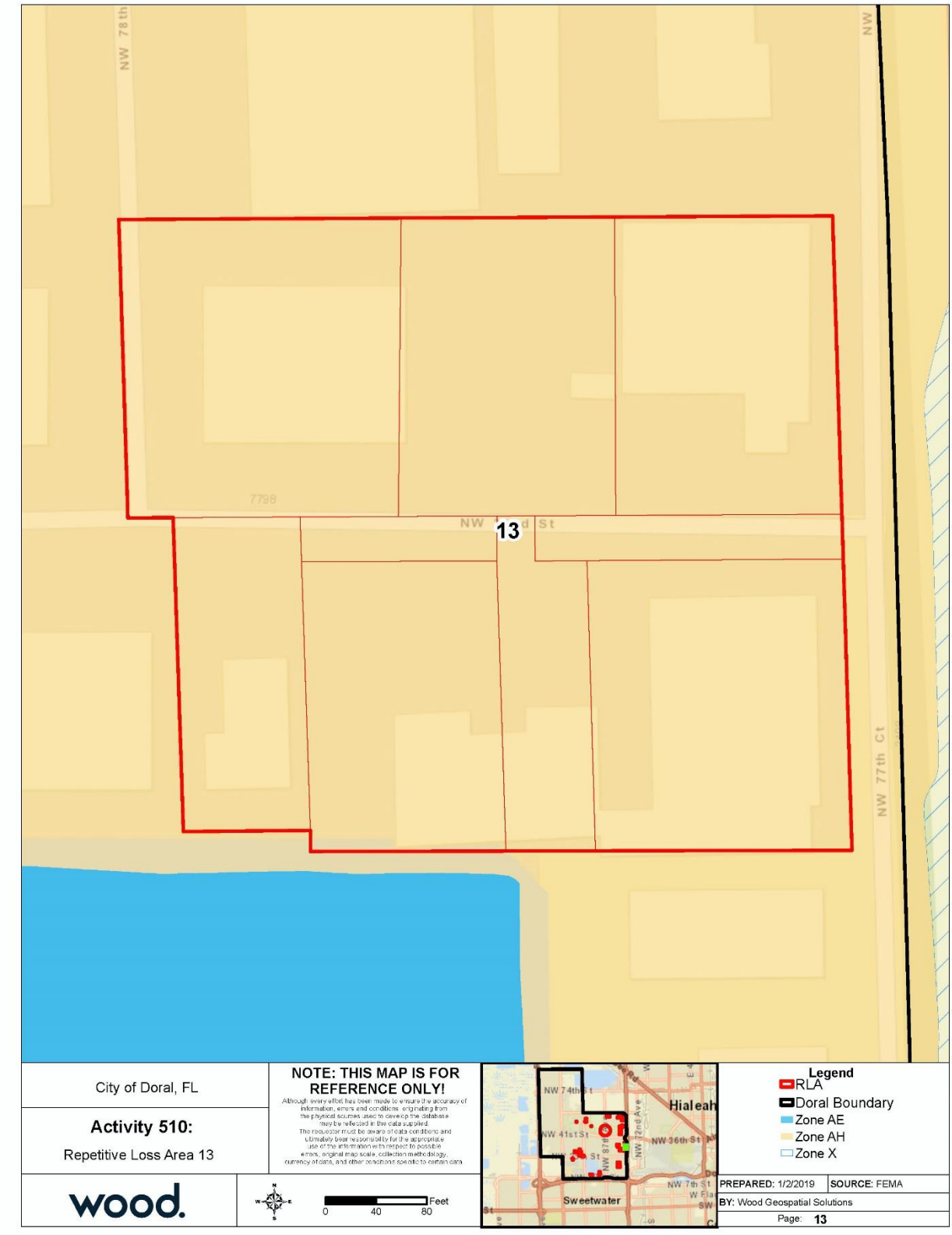


Figure 2.20 – Repetitive Loss Area 13

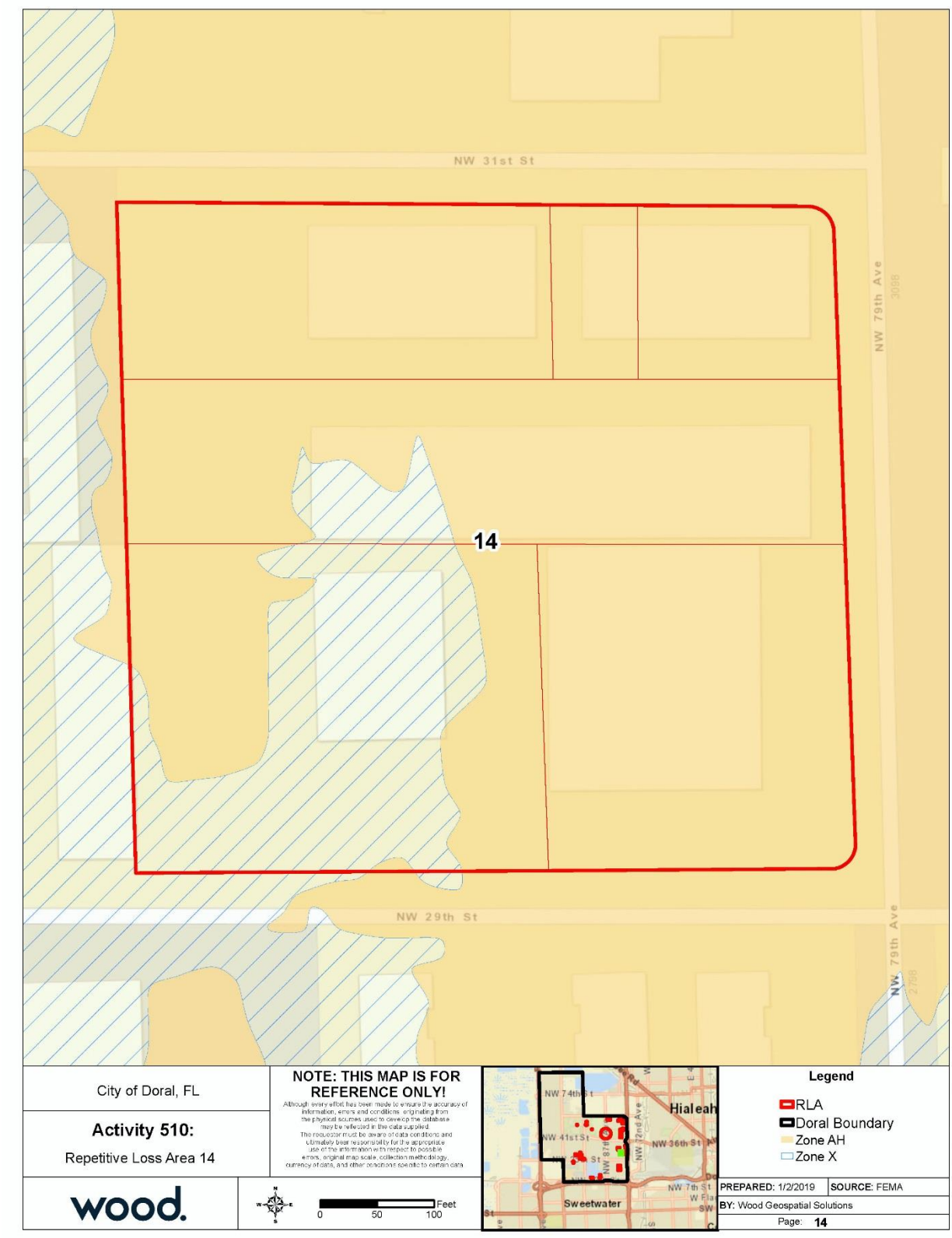


Figure 2.21 – Repetitive Loss Area 14

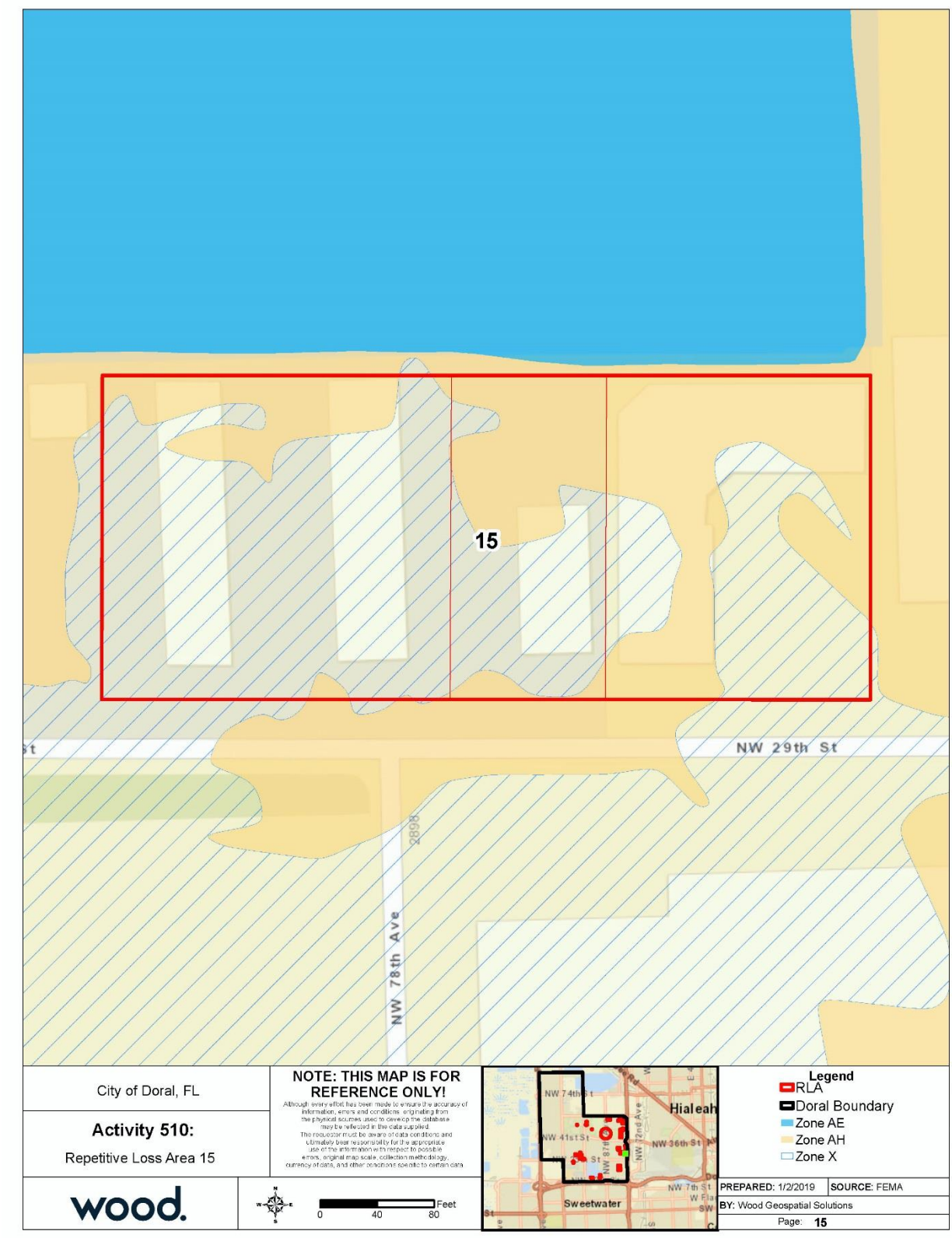


Figure 2.22 – Repetitive Loss Area 15

Example Properties in Subarea 4

Repetitive Loss Area 11 – Building sits below grade; water runs off street toward buildings and from parking lot to building

Repetitive Loss Area 12 – Pump system in place to drain parking lot

Repetitive Loss Area 13 – Building elevated but inside warehouse is below grade

Repetitive Loss Area 14 – Inside of building is elevated

Repetitive Loss Area 15 – Building is elevated above street grade and parking lot

Subarea 5

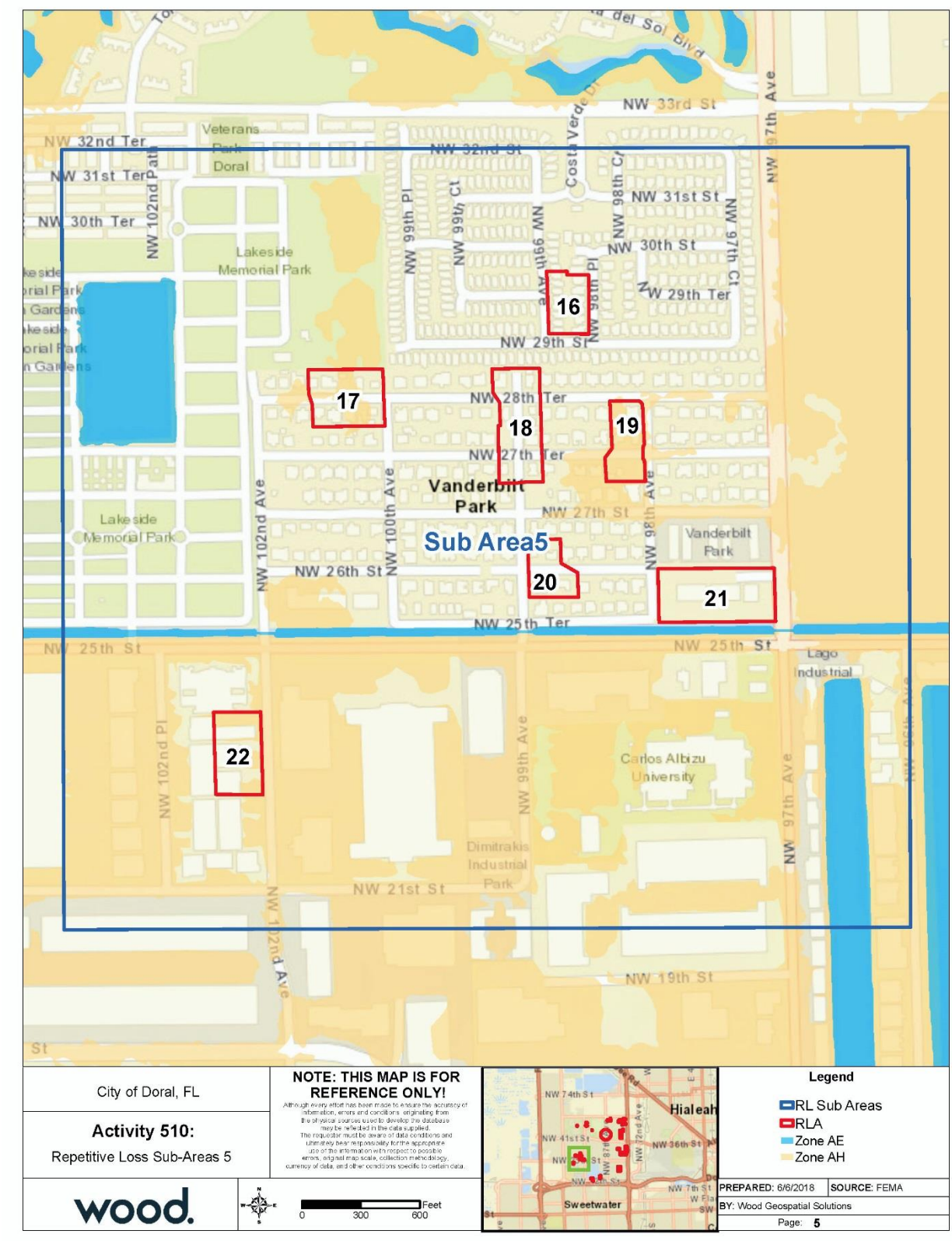


Figure 2.23 – Repetitive Loss Subarea 5

Repetitive Loss Area 16 is located completely outside the 100-yr floodplain in the unshaded Zone X. The area is residential with masonry buildings and slab on grade foundations. Most houses are elevated slightly above street grade. Only three houses have any guttering. HVAC units were not observable.

Repetitive Loss Area 17 is located partially within the 100-yr floodplain in Zone AH and partially outside the floodplain in the unshaded Zone X. The area is residential with some commercial use. Buildings are masonry with slab on grade foundations. Most buildings are elevated slightly above street grade, however one building is at grade and one is below grade. HVAC units were not observable.

Repetitive Loss Area 18 is located completely outside the 100-yr floodplain in the unshaded Zone X. The area is residential with masonry buildings and slab on grade foundation types. Several houses have lots or roads that slope toward the house. One house in the area is new and is elevated with a retaining wall around the property. One observed HVAC system was elevated to the first living level.

Repetitive Loss Area 19 is located almost completely within the 100-yr floodplain in Zone AH. The area is residential with various structure types, all on slab on grade foundations. Two houses are at grade and two are slightly below grade. One house had a drainage inlet out front. HVAC units were not observable.

Repetitive Loss Area 20 is located completely outside the 100-yr floodplain in the unshaded Zone X. The area is residential with masonry buildings and slab on grade foundation types. Two buildings are at grade, one is well elevated, and another is well below street grade. The elevated structure also had its HVAC elevated to the first floor; other HVAC systems were not observable.

Repetitive Loss Area 21 is located outside the 100-yr floodplain in the unshaded Zone X. The area is commercial with concrete buildings and slab on grade foundation types. Both buildings are at grade with lots sloping toward the building. Both buildings have HVAC systems elevated above the first floor.

Repetitive Loss Area 22 is located partially within the 100-yr floodplain in Zone AH and partially outside the floodplain in the unshaded Zone X. The area is industrial with concrete buildings and slab on grade foundations. Two buildings are well elevated, the other is at grade and the parking lot catches water. All HVAC systems were elevated above the first floor.

Table 2.6 – Repetitive Loss Area Overview for Subarea 5

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
16	2	0	12	14	NW 98th Pl, NW 99th Ave
17	2	0	6	8	NW 28th Ter
18	2	0	6	8	NW 99th Ave, NW 28th Ter, NW 27th Ter
19	1	0	4	5	NW 98th Ave, NW 28th Ter, NW 27th Ter
20	1	0	3	4	NW 26th St, NW 99th Ave
21	1	0	1	2	NW 97th Ave
22	1	0	2	3	NW 102nd Ave
Total	**10**	**0**	**36**	**44**	

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.

Subarea 5 contains a total of 44 properties including 1 vacant lot discovered during field survey.

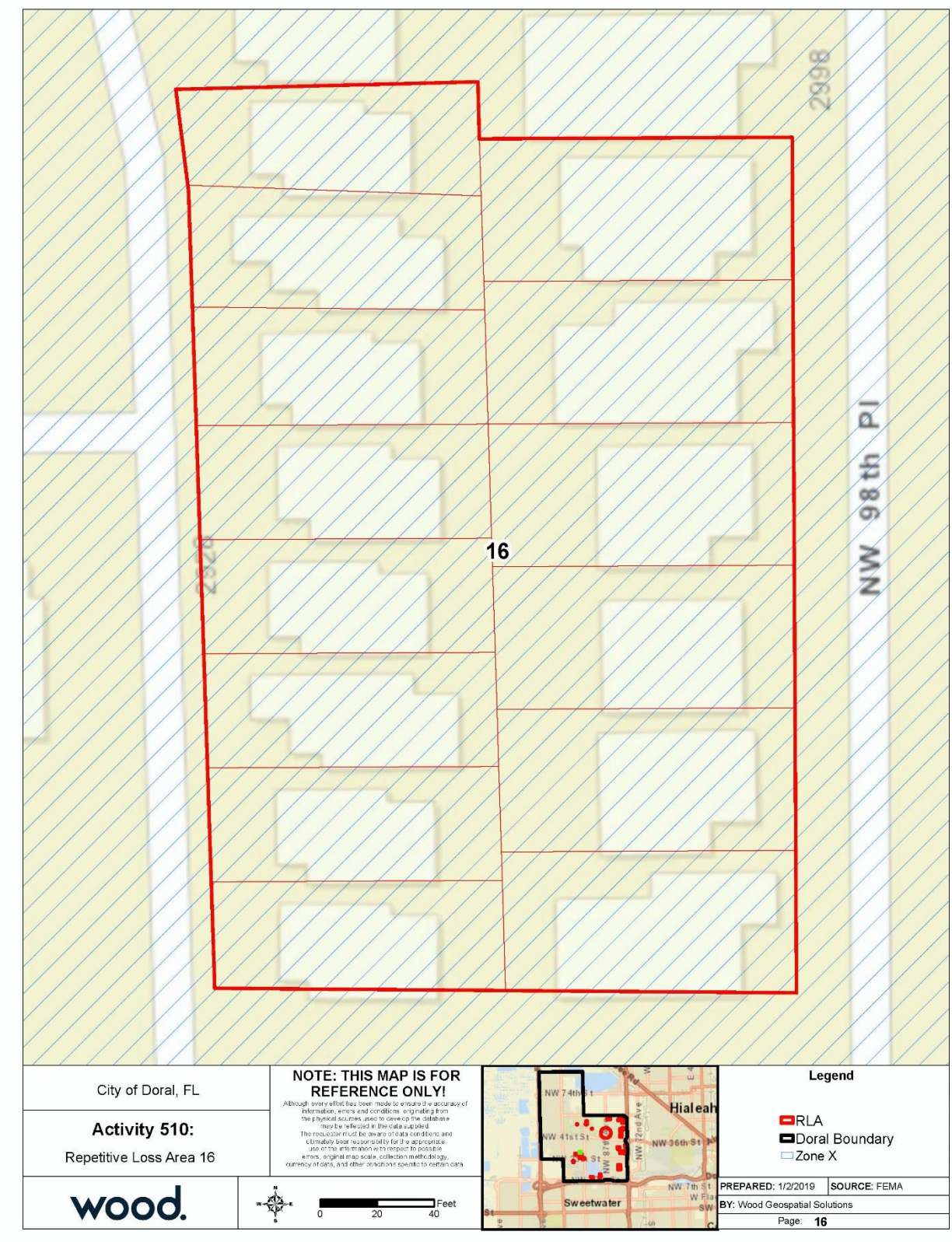


Figure 2.24 – Repetitive Loss Area 16

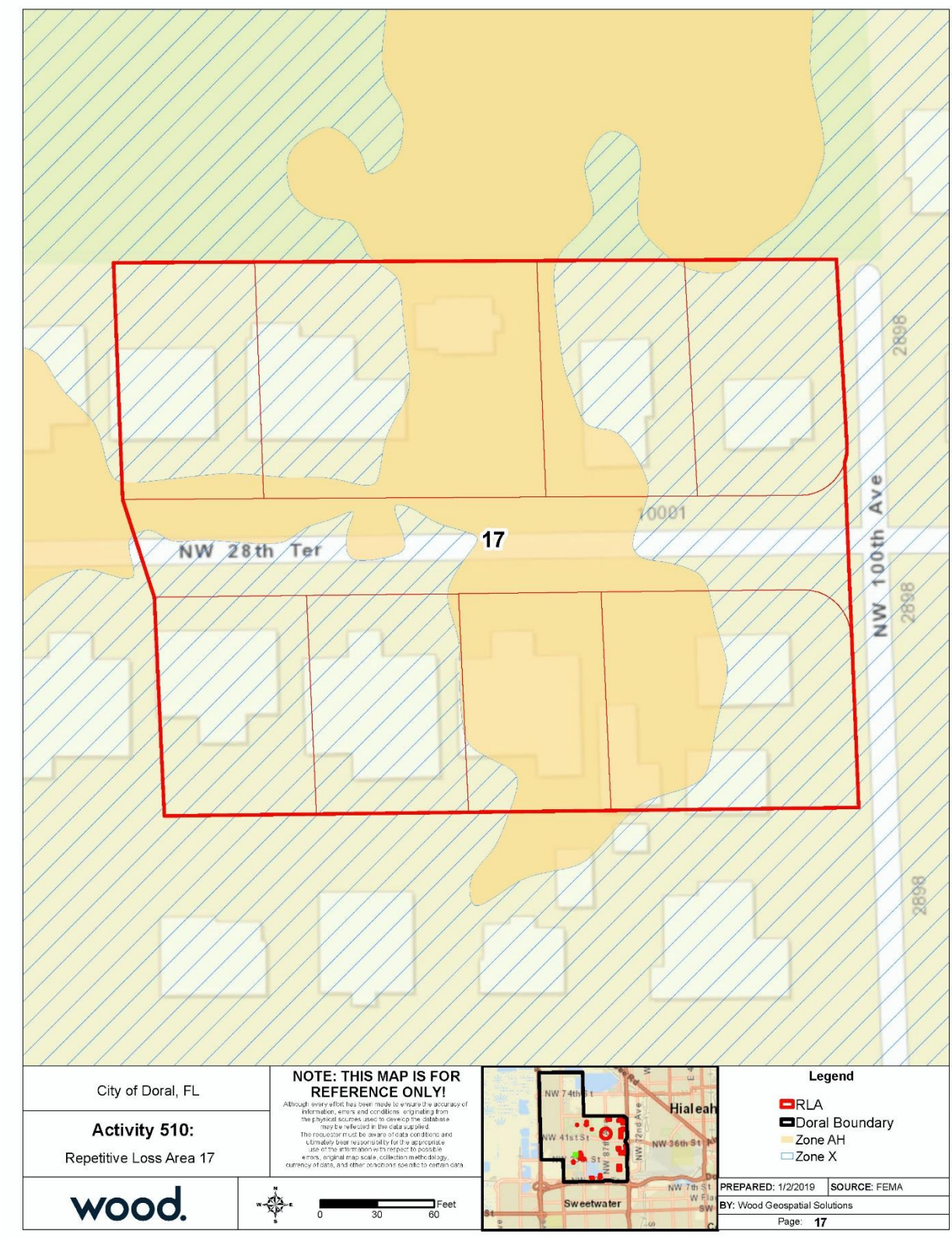


Figure 2.25 – Repetitive Loss Area 17

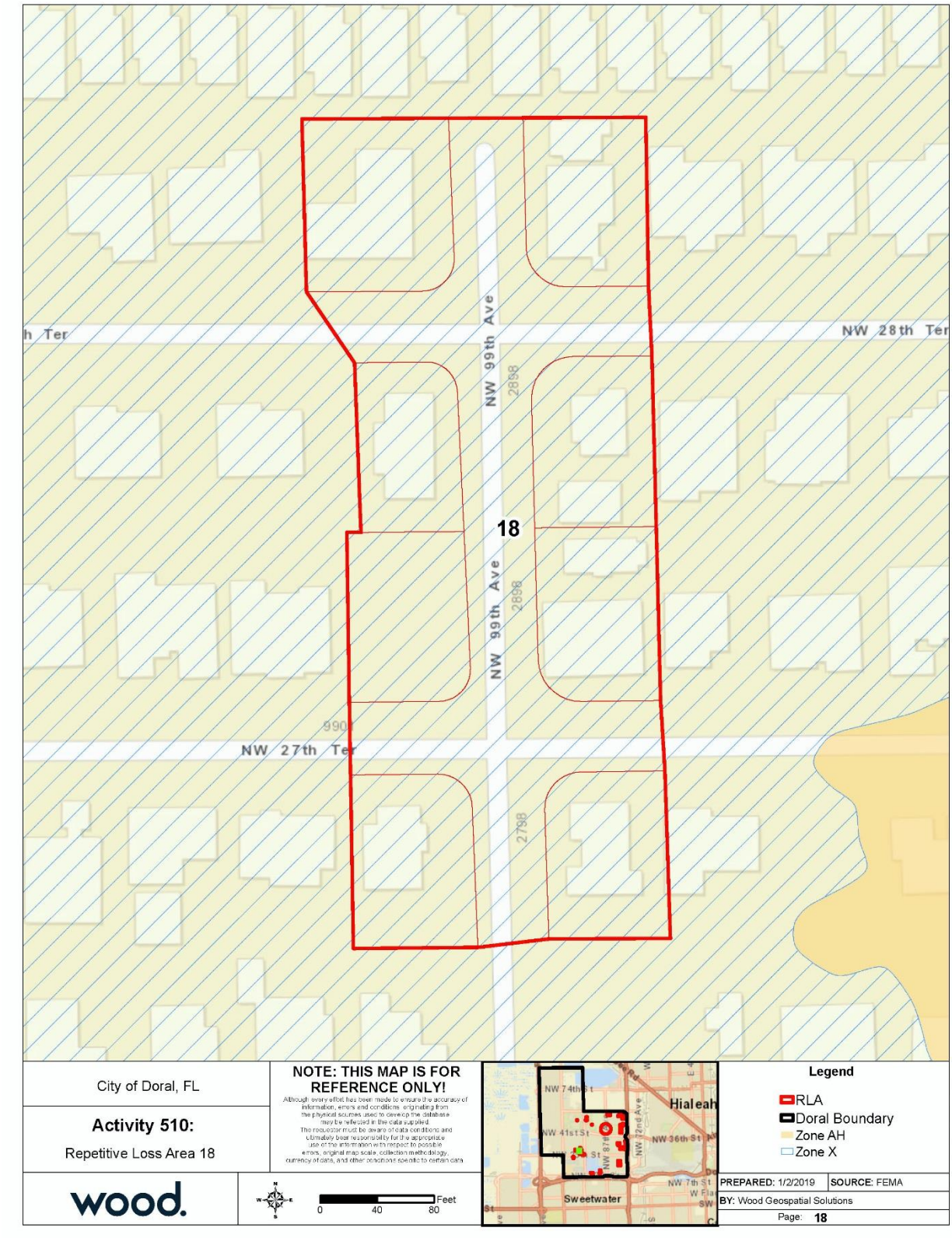


Figure 2.26 – Repetitive Loss Area 18

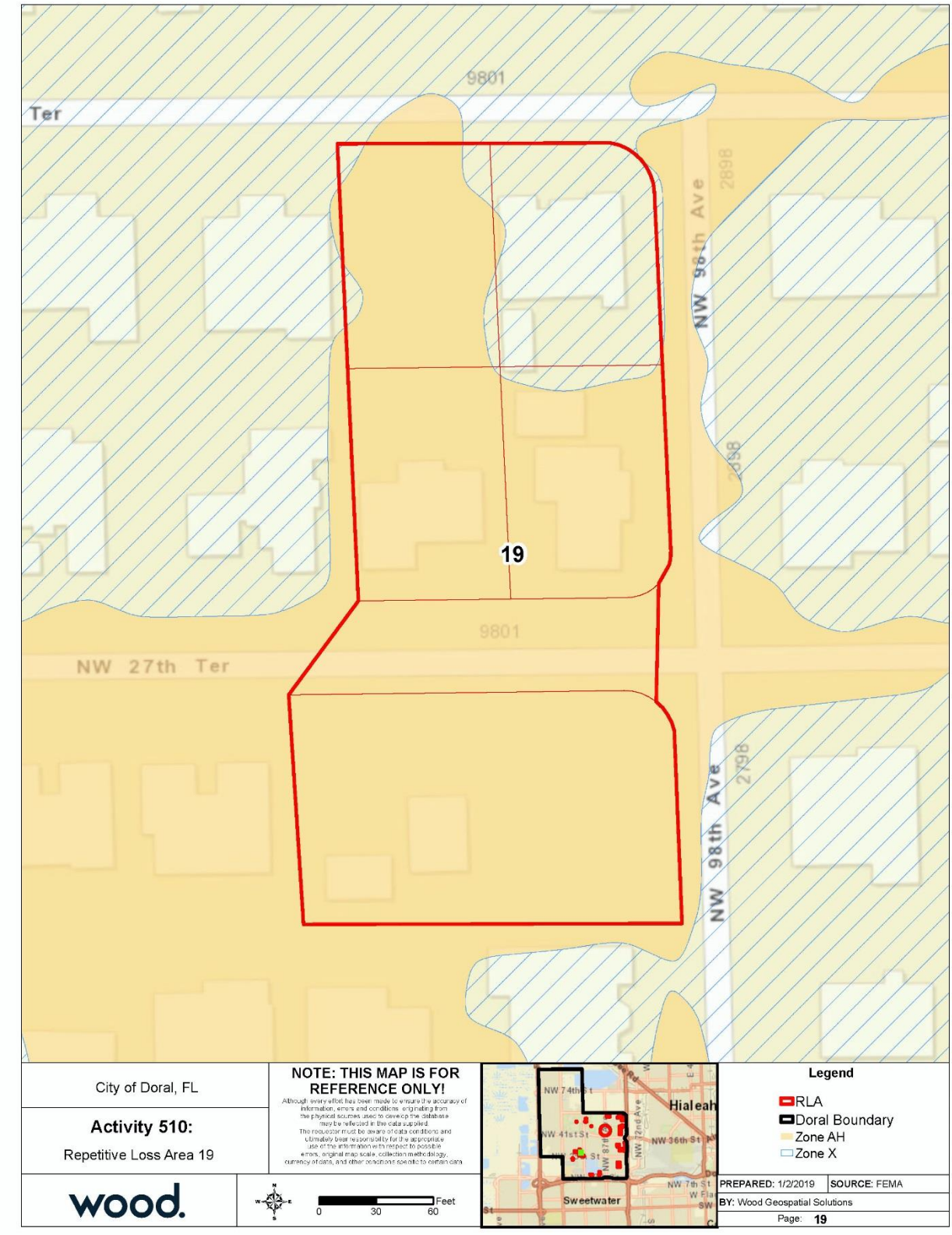


Figure 2.27 – Repetitive Loss Area 19

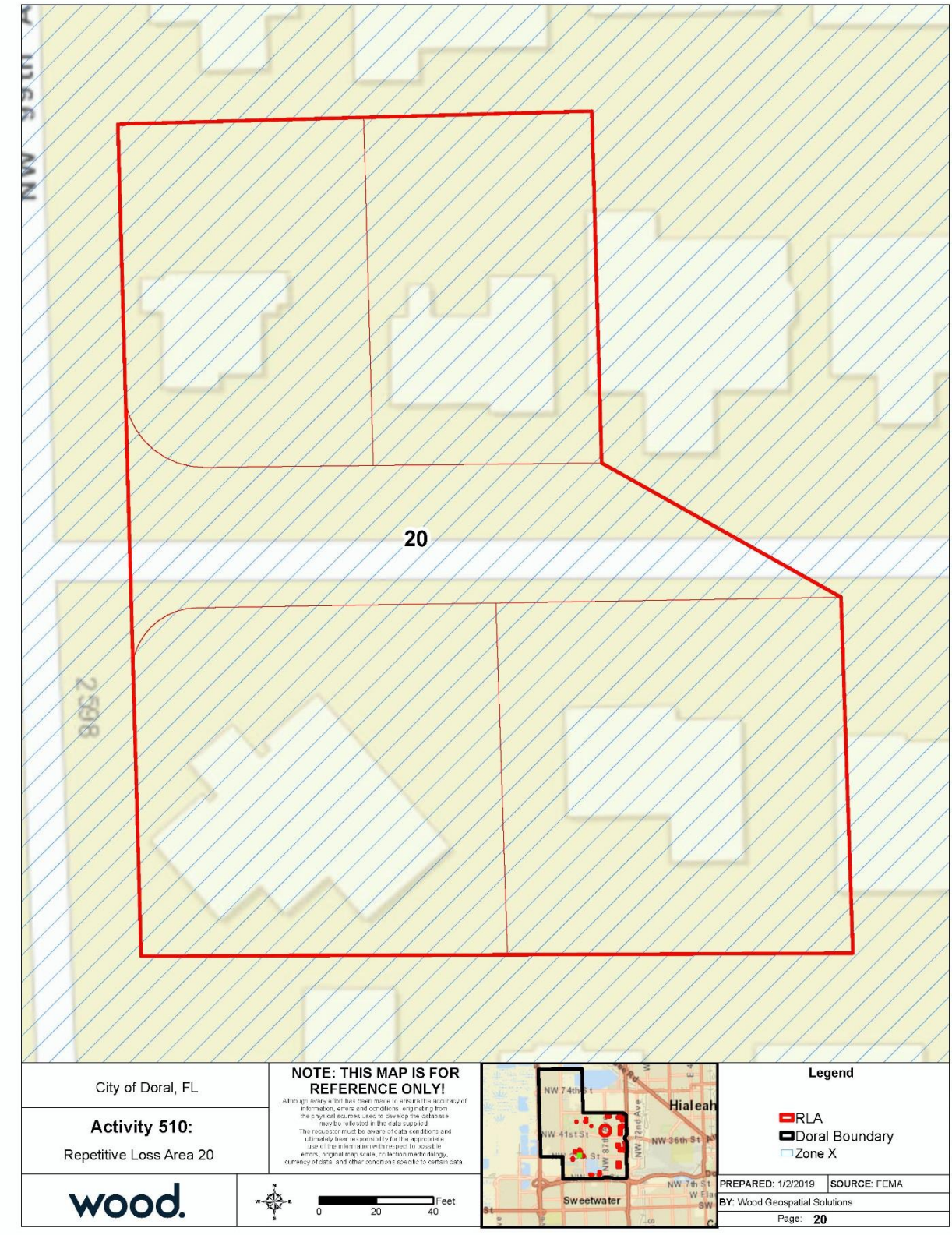


Figure 2.28 – Repetitive Loss Area 20

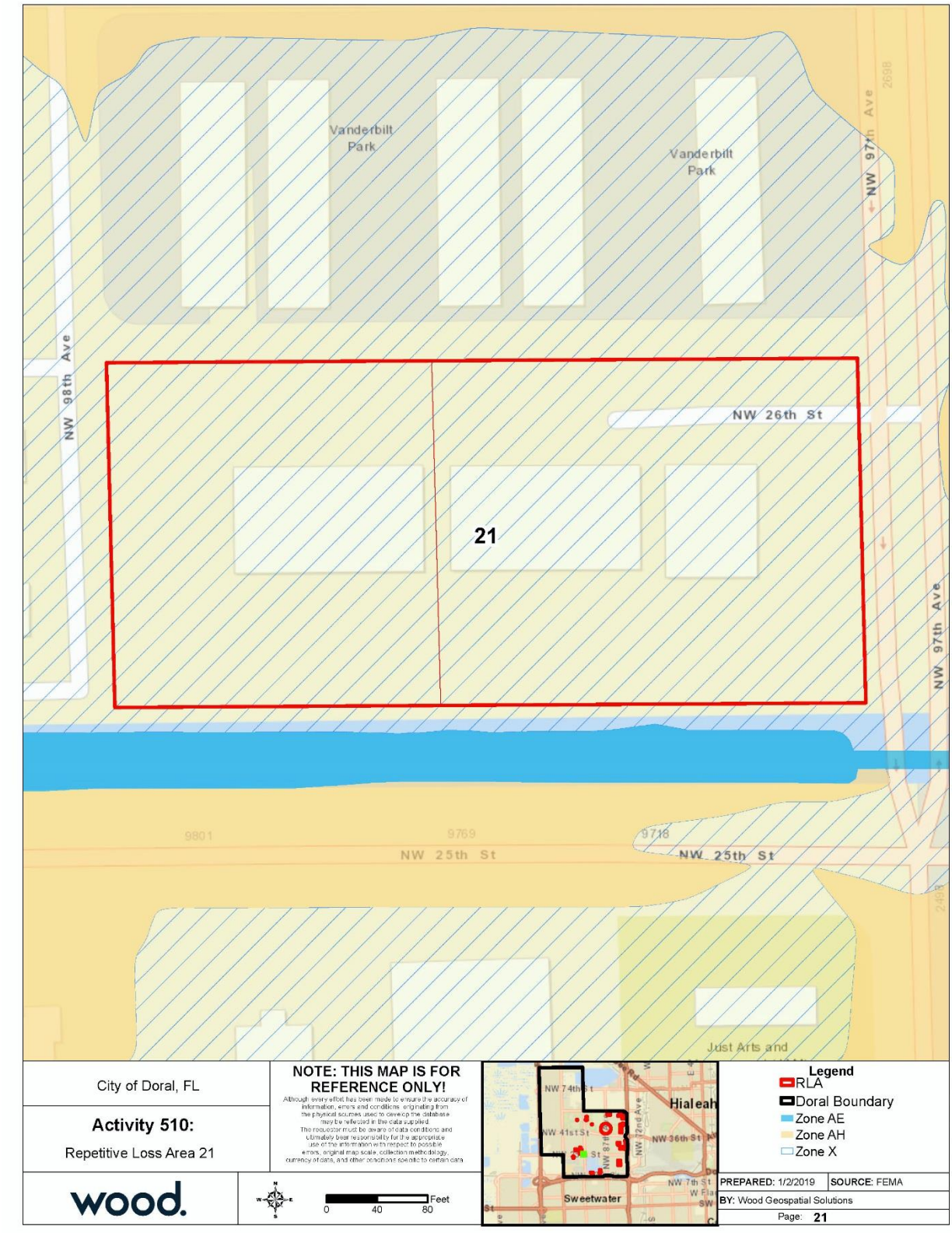


Figure 2.29 – Repetitive Loss Area 21

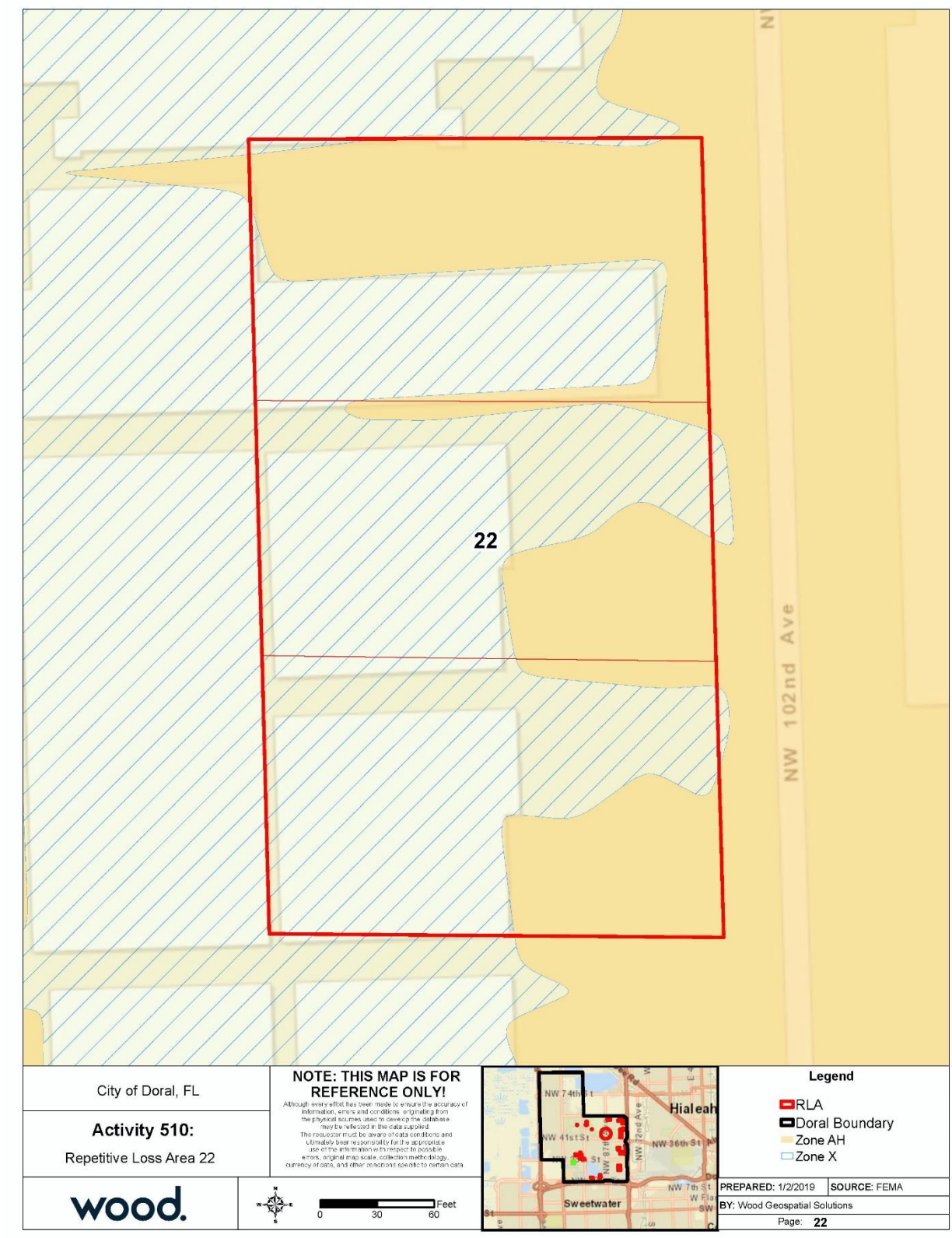


Figure 2.30 – Repetitive Loss Area 22

Example Properties in Subarea 5

Repetitive Loss Area 16 – House at grade without guttering

Repetitive Loss Area 17 – House below grade

Repetitive Loss Area 18 – Road and driveway slope toward house

Repetitive Loss Area 19 – House slightly elevated with drainage inlet in front yard

Repetitive Loss Area 20 – House below grade

Repetitive Loss Area 21 – Parking lot slopes toward building

Subarea 6

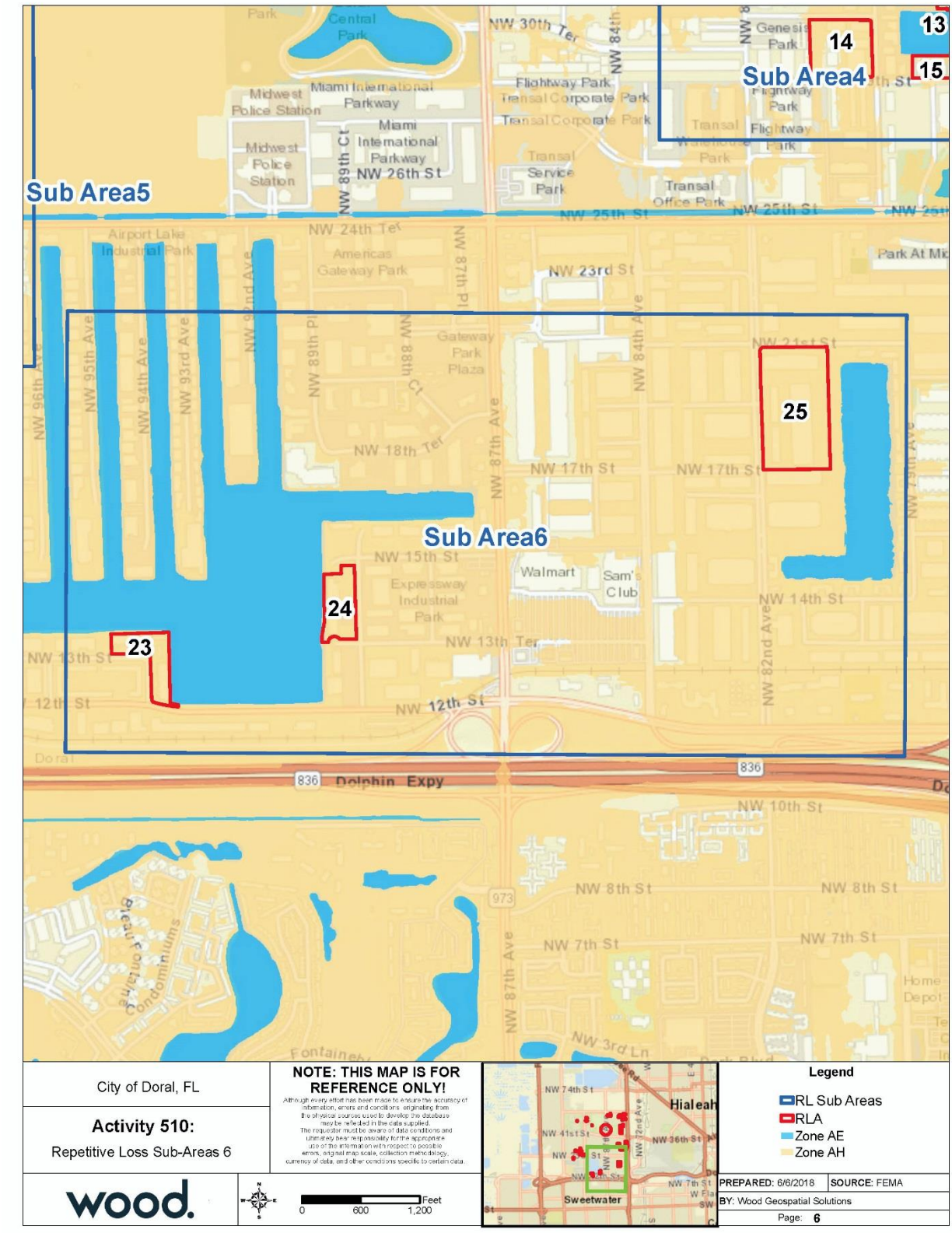


Figure 2.31 – Repetitive Loss Subarea 6

Repetitive Loss Area 23 is located entirely within the 100-yr floodplain in Zone AH. This area sits adjacent to a large pond. The area is industrial with concrete buildings and slab on grade foundations. Both buildings are at grade and parking lots that slope toward the building. One building appears to have storage in the first level, the other has offices in the lower level, which sit slightly below street grade. Both HVAC systems were elevated above the first floor.

Repetitive Loss Area 24 is located entirely within the 100-yr floodplain in Zone AH. The area is adjacent to a large pond. The area is commercial with concrete buildings and slab on grade foundation types. The buildings are all at street grade. One property was found to be a parking lot, another two were gutted vacant buildings. All HVAC systems were observed to be elevated to above the first floor.

Repetitive Loss Area 25 is located completely within the 100-yr floodplain in Zone AH. Two of the buildings in this area are at street grade, while two others are elevated adequately above grade. However, of the elevated buildings, one is at grade with the surrounding parking lot, which may still result in localized stormwater flooding issues. Two properties have parking lots sloped to catch water in the center. All HVAC units were observed to be elevated above the first floor.

Table 2.7 – Repetitive Loss Area Overview for Subarea 6

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
23	1	0	1	2	NW 93rd Ct
24	1	0	8	9	NW 13th Ter, NW 89th Ct
25	3	2*	1	4	NW 82nd Ave, NW 21st St
Total	**5**	**2***	**10**	**15**	

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.
*Historical claims occurred in the same buildings where repetitive losses occurred; however multiple addresses are located in one building. During field survey each building was evaluated as a whole.

Subarea 6 contains a total of 15 properties including two gutted vacant buildings and a parking lot discovered during field survey.

Figure 2.32 – Repetitive Loss Area 23

Figure 2.33 – Repetitive Loss Area 24

Figure 2.34 – Repetitive Loss Subarea 25

Example Properties in Subarea 6

Repetitive Loss Area 23 – First floor offices sit slightly below grade

Repetitive Loss Area 24 – Building at grade and adjacent to large pond

Repetitive Loss Area 25 – Building at grade; parking lot is sloped to catch and drain water

STEP 4. Review Alternative Mitigation Approaches

Mitigation Alternatives

According to the 2017 CRS Coordinator's Manual, mitigation measures should fall into one of the following floodplain management categories:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

Property protection is essential to mitigating repetitive loss properties and reducing future flood losses. There are many ways to protect a property from flood damage. Property protection measures recognized in the 2017 CRS Coordinator's Manual include relocation, acquisition, building elevation, retrofitting, sewer backup protection, and insurance. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 2.35 below, found in the 2017 CRS Coordinator's Manual, lists typical property protection measures.

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Source: 2017 CRS Coordinators Manual.

Figure 2.35 – Typical Property Protection Measures

Improving the stormwater drainage system, drainage maintenance, and storage capacity throughout the City of Doral can eliminate some building damage and road closures in repetitive loss areas. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and flood insurance and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The City's websites, e-mail distribution lists, press releases, information boards, and variable message boards can help get these messages out to business owners and residents.

Mitigation Funding

There are several types of mitigation measures, listed in Table 2.8, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant programs. Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home. Please note, the Biggert-Waters 2012 National Flood Insurance Reform Act eliminated the previously available Repetitive Flood Claims grant program.

Table 2.8 – Mitigation Grant Programs

Types of Projects Funded	HMGP	FMA	PDM	SRL	IIC	SBA
Acquisition of the entire property by a gov't	D	D	D	D		
Relocation of the building to a flood free site	D	D	D	D	D	D
Demolition of the structure	D	D	D	D	D	D
Elevation of the structure above flood levels	D	D	D	D	D	D
Replacing the old building with a new elevated	D			D	D	D
Local drainage and small flood control projects	D			D		
Dry floodproofing (non-residential buildings only)		D	D	D	D	D
Percent paid by Federal program	75%	75%	75%	75%	100%	0
Application Notes	1,2	1	1	1	3	2,4

Application notes:

1. Requires a grant application from your local government
2. Only available after a Federal disaster declaration
3. Requires the building to have a flood insurance policy and to have been flooded to such an extent that the local government declares it to be substantially damaged. Pays 100% up to $30,000
4. This is a low interest loan that must be paid back

Potential Mitigation Measures

Structural Alternatives	Non-Structural Alternatives
Dry floodproofing. Commercial structures and even residential structures are eligible for dry floodproofing; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.	Provide public education through posting information about local flood hazards on City's websites, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
Wet floodproofing. Wet floodproofing a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.	Implement volume control and runoff reduction measures in the City's Stormwater Management Ordinance.
For basements, especially with combined storm sewer and sewer systems, backflow preventer valves can prevent storm water and sewer from entering crawlspaces and basements.	Consider expanding riparian impervious surface setbacks.
Acquire and/or relocate properties/target abandoned properties.	Relocate internal supplies, products/goods above the flooding depth.
Elevate structures and damage-prone components, such as the furnace or air conditioning unit, above the BFE.	Promote the purchase of flood insurance.
Construct engineered structural barriers, berms, and floodwalls (Note: Assuming lot has required space for a structural addition).	Improve the City's floodplain and zoning ordinances
Increase road elevations above the BFE of the 100-year floodplain.	
Implement drainage improvements such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.	
Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.	

Current Mitigation Projects

Stormwater Drainage Capital Improvements

The City's 2016/17 – 2020/21 Schedule of Capital Improvements allocates a total of $1,640,000 for stormwater drainage improvements throughout the City. Annually, the plan identifies specific projects or sites to be addressed with this funding on a priority ranking process.

Advantages and Disadvantages of Mitigation Measures

Seven primary mitigation measures are discussed here: acquisition, relocation, barriers, floodproofing, drainage, elevation, and insurance. In general, the cost of acquisition and relocation will be higher than other mitigation measures but can completely mitigate risk of any future flood damage. Building small barriers to protect single structures is a lower cost solution, but it may not be able to offer complete protection from large flood events and may impact flood risk on other properties. Where drainage issues are the source of repetitive flooding, drainage improvements can provide flood mitigation benefits to multiple properties. Each of these solutions is discussed in greater detail below.

Acquisition:

Property acquisition and/or relocation are complex processes requiring transferring private property to property owned by the local government for open space purposes. Acquisition is a relatively expensive mitigation measure, but it provides the greatest benefit in the lives and property are protected from flood damage. The major cost for the acquisition method is for purchasing the structure and land. The total estimated cost for acquisition should be based on the following:

- Purchase of Structure and land
- Demolition
- Debris removal, including any landfill processing fees
- Grading and stabilizing the property site
- Permits and plan review

Table 2.9 – Advantages and Disadvantages of Acquisition

Advantages	Disadvantages
• Permanently removes problem since the structure no longer exists. • Allows a substantially damaged or substantially improved structure to be brought into compliance with the community's floodplain management ordinance or law. • Expands open space and enhances natural and beneficial uses. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,

- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and,
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

Relocation:

Relocation involves lifting and placing a structure on a wheeled vehicle and transporting that structure to a site outside the 100-year floodplain and placed on a new permanent foundation. Like acquisition, this is one of the most effective mitigation measures.

Table 2.10 – Advantages and Disadvantages of Relocation

Advantages	Disadvantages
• Removes flood problem since the structure is relocated out of the flood-prone area. • Allows a substantially damaged or substantially improved structure to be brought into compliance with a community's floodplain management ordinance. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Additional costs are likely if the structure must be brought into compliance with current code requirements for plumbing, electrical, and energy systems.

The cost for relocation will vary based on the type of structure and the condition of the structure. It is considerably less expensive to relocate a home that is built on a basement or crawl space as opposed to a structure that is a slab on grade. Additionally, wood sided structures are less expensive to relocate than structures with brick veneer. Items to consider in estimating cost for relocation include the following:

- Site selection and analysis and design of the new location
- Analysis of existing size of structure
- Analysis and preparation of the moving route
- Preparation of the structure prior to the move
- Moving the structure to the new location
- Preparation of the new site
- Construction of the new foundation
- Connection of the structure to the new foundation
- Restoration of the old site

Barriers:

A flood protection barrier is usually an earthen levee/berm or a concrete retaining wall. While levees and retaining walls can be large spanning miles along a river, they can also be constructed on a much smaller scale to protect a single home or group of homes.

Table 2.11 – Advantages and Disadvantages of Barriers

Advantages	Disadvantages
• Relative cost of mitigation is less expensive than other alternatives. • No alterations to the actual structure or foundation are required. • Home owners can typically construct their own barriers that will complement the style and functionality of their house and yard.	• Property is still located within the floodplain and has potential to be damaged by flood if barrier fails or waters overtop it. • Solution is only practical for flooding depths less than 3 feet. • Barriers cannot be used in areas with soils that have high infiltration rates.

The cost of constructing a barrier will depend on the type of barrier and the size required to provide adequate protection. An earthen berm will generally be less expensive compared to an equivalent concrete barrier primarily due to the cost of the materials. Another consideration is space; an earthen barrier requires a lot of additional width per height of structure compared to a concrete barrier to ensure proper stability. Key items to consider for barriers:

- There needs to be adequate room on the lot
- A pump is required to remove water that either falls or seeps onto the protected side of the barrier
- Human intervention will be required to sand bag or otherwise close any openings in the barrier during the entire flood event

Floodproofing:

Wet floodproofing a structure consists of modifying the uninhabited portions (such as a crawlspace or an unfinished basement) to allow floodwaters to enter and exit. This ensures equal hydrostatic pressure on the interior and exterior of the structure which reduces the likelihood of wall failures and structural damage. Wet floodproofing is practical in only a limited number of situations.

Table 2.12 – Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantages
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Pumping floodwaters out of a basement too soon after a flood may lead to structural damage. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

A dry floodproofed structure is made watertight below the level that needs flood protection to prevent floodwaters from entering. Making the structure watertight involves sealing the walls with waterproof coatings, impermeable membranes, or a supplemental layer of masonry or concrete; installing watertight shields over windows and doors; and installing measures to prevent sewer backup.

Table 2.13 – Advantages and Disadvantages of Dry Floodproofing

Advantage	Disadvantages
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Drainage Improvements:

Methods of drainage improvements include overflow channels, channel straightening, restrictive crossing replacements, and runoff storage. Modifying the channel attempts to provide a greater carrying capacity for moving floodwaters away from areas where damage occurs. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Table 2.14 – Advantages and Disadvantages of Drainage Improvements

Advantages	Disadvantages
• Could increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage. • Minor projects may be fundable under FEMA mitigation grant programs.	• May help one area but create new problems upstream or downstream. • Channel straightening increases the capacity to accumulate and carry sediment. • May require property owner cooperation and right-of-way acquisition.

Elevation:

Elevating a structure to prevent floodwaters from reaching living areas is an effective and one of the most common mitigation methods. Elevation may also apply to roadways and walkways. The goal of the elevation process is to raise the lowest floor of a structure or roadway/walkway bed to or above the required level of protection.

Table 2.15 – Advantages and Disadvantages of Elevation

Advantages	Disadvantages
• Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance. • Often reduces flood insurance premiums. • Reduces or eliminates road closures due to overtopping. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • The appearance of the structure and access to it may be adversely affected. • May require property owner cooperation and right-of-way acquisition. • May require road or walkway closures during construction.

NOTE: Elevating a structure with a slab-on-grade foundation can cost over 30 percent more than elevating a structure on a crawlspace foundation. Nearly all of the properties located in Doral's Repetitive Loss Areas have slab-on-grade foundations, which may mean this mitigation alternative will be cost-prohibitive.

Flood Insurance:

Insurance differs from other property protection activities in that it does not mitigate or prevent damage caused by a flood. However, flood insurance does help the owner repair and rebuild their property after a flood, and it can enable the owner to afford incorporating other property protection measures in that process. Insurance offers the advantage of protecting the property, as long as the policy is in force, without requiring human intervention for the measure to work.

Table 2.16 – Advantages and Disadvantages of Flood Insurance

Advantages	Disadvantages
• Provides protection outside of what is covered by a homeowners' insurance policy. • Can help to fund other property protection measures after a flood through increased cost of compliance (ICC) coverage. • Provides protection for both structure and contents. • Can be purchased anywhere in a community, including outside of a flood zone.	• Cost may be prohibitive. • Policyholders may have trouble understanding policy and filing claims. • Does not prevent or mitigate damage.

STEP 5. Conclusion and Recommendations

Conclusion

Based on the field survey and collection of data, the analysis of existing studies and reports, the evaluation of various structural and non-structural mitigation measures, and a review of past and current mitigation activities in the City, the City of Doral has identified several projects that should be implemented for these Repetitive Loss Areas, detailed below under Recommendations. Table 2.17 summarizes past and current mitigation actions in this area.

Table 2.17 – Past and Current Mitigation Actions

Past and Current Mitigation Actions	
1	At least one property owner has documented flooding and identified flooding concerns in a returned questionnaire from this analysis.
2	The City has eliminated two properties from the repetitive loss list through provision of flood protection.
3	The City has undertaken capital improvement projects to improve drainage and continues to budget for these improvements.

Prioritization

In order to facilitate the implementation of the following recommended mitigation actions, a prioritization schedule is included based on the following:

- Cost
- Funding Availability
- Staff Resources
- Willingness of Property Owner to Participate
- Additional Planning Requirements

The priority rating for the following mitigation actions is summarized in Table 2.18. Each of the above prioritization variables was rated on a scale of 1 to 5, with 5 indicating the greatest difficulty for implement. The weight of each variable is indicated in the prioritization table. Those mitigation actions with the lowest overall priority scores should be implemented first. An overall priority rating of high, medium, or low is assigned to each recommended action, using the following scale:

- High Priority (should be completed within 2 years): Score of 0.00 – 1.99
- Medium Priority (should be completed within 2 to 4 years): Score of 2.00 – 3.99
- Low Priority (should completed within 4 to 5 years): Score of 4.00 – 5.00

Recommendations

The City will encourage property owners to use floodproofing measures to help protect lower levels of their property. The City will also increase its public education efforts to increase awareness of flood preparedness and flood protection measures including moving valuable items to above the flood elevation and permanently elevating vulnerable HVAC units. At the same time, the City will work with property owners, citizens, the state and other regional and federal agencies to implement capital improvement projects which will help to eliminate flooding in the repetitive loss areas.

Mitigation Action 1: Flood Insurance Promotion

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The City will continue on an **annual basis** to target all properties in the repetitive loss areas reminding them of the advantages to maintaining flood insurance through its annual outreach effort. Repetitive Loss Areas are noted as a target area in the City's Program for Public Information (PPI).

Responsibility: The City's Building Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas through annual outreach and other efforts.

Funding: The cost will be paid for from the City's operating budget.

Priority: High

Target Area: All Repetitive Loss Areas

Mitigation Action 2: Preferred Risk Policy Promotion

As part of the annual outreach to the repetitive loss areas, the City will provide specific information on the availability of Preferred Risk Policies for property owners in the low-risk Zone X.

Responsibility: The City's Building Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas through annual outreach and other efforts.

Funding: The cost will be paid for from the City's operating budget.

Priority: High

Target Area: Subarea 1, Subarea 2, Subarea 3, Subarea 5

Mitigation Action 3: Property Protection Information

Property owners should not store valuable personal property in lower areas or areas that might be slightly below grade since personal property is not covered by a flood insurance policy without contents coverage. The City will increase its outreach efforts on an **annual basis** for the identified repetitive loss areas to include this specific information in the outreach materials.

Responsibility: The City's Building Department will provide the most relevant up-to-date information to all property owners within the repetitive loss areas.

Funding: The cost will be paid for from the City's operating budget.

Priority: High

Target Area: Subarea 2, Subarea 4, Subarea 5, Subarea 6

Mitigation Action 4: Floodproofing

When appropriate, commercial property owners should consider floodproofing measures such as flood gates or shields, flood walls, hydraulic pumps, and elevating electrical services including electrical outlets. Floodproofing advice can also be shared with residential properties where simple measures can work such as a small berm, sandbagging, and other barriers, etc.

Responsibility: The City's Building Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

Funding: The cost will be paid for by individual property owners. Advice and assistance will require staff time. Promotion of existing floodproofing measures may require some additional funds from the City's operating budget.

Priority: Medium

Target Area: Subarea 2, Subarea 4, Subarea 5, and Subarea 6

Mitigation Action 5: Acquisition & Demolition

The City will pursue potential acquisition and/or demolition mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection. Acquisition and demolition has already been used to mitigate two properties on the repetitive loss list, one in Zone AE and one in Zone X.

Responsibility: The City's Building Department will investigate potential opportunities for acquisition and demolition.

Funding: The acquisition and demolition can be paid for using FEMA's Hazard Mitigation Grant Program (HMGP). Staff time to develop the list of potential properties will require funds from the City's operating budget.

Priority: Low

Target Area: All Repetitive Loss Areas

Mitigation Action 6: CIP Drainage Improvements and Property Revitalization

Several respondents to the flood protection questionnaire responded that they have never experienced flooding issues, which suggest that flooding in repetitive loss areas is highly localized and may be best solved through drainage improvements. The City should prioritize CIP projects to focus on drainage issues in the identified repetitive loss areas and the drainage basins that contain them. Additionally, when large tracts of land are purchased and redeveloped, improved drainage can reduce some flood conditions. Some streets in the warehouse district are private which requires property owners to make drainage improvements.

Responsibility: The City's Public Works Department.

Funding: The cost will be paid for by the City's Stormwater Fund.

Priority: Medium

Target Area: All Repetitive Loss Areas

Mitigation Action 7: Elevate Mechanical Equipment

In all but one of the Subareas, HVAC units were either found to be not elevated or could not be seen for confirmation of elevation. The City will encourage property owners to elevate inside and outside mechanical equipment above the BFE.

Responsibility: The City's Building Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an on-going program.

Funding: The cost will be paid for by individual property owners. Advice and assistance will require staff time. Promotion of existing floodproofing measures may require some additional funds from the City's operating budget.

Priority: Medium

Target Area: Subarea 1, Subarea 2, Subarea 3, Subarea 4, Subarea 5

Mitigation Action 8: Contents Coverage for Renters

The City's parcel data suggests that many properties in the repetitive loss areas are renter-occupied. Renters typically have less power to implement physical changes to mitigate flooding, but they do have the ability to protect themselves with flood insurance. Therefore, the City's Building Department will encourage renters to purchase flood insurance for their contents.

Responsibility: The City's Building Department along with local insurance agents will promote the benefits of renter's insurance.

Funding: The cost will be paid for by the City's operating budget.

Priority: Medium

Target Area: All Repetitive Loss Areas

Prioritization Table

Table 2.18 – Prioritization of Recommended Mitigation Actions

Mitigation Action #	Prioritization Variables (Weight)					Total
	Cost (30%)	Funding Availability (25%)	Property Owner Willingness (20%)	Staff Resources (15%)	Planning Needs (10%)	
1: Ongoing outreach to promote flood insurance	2	2	1	1	1	**1.55**
2: Promote availability of Preferred Risk Policies (PRP)	2	2	1	1	1	**1.55**
3: Ongoing outreach about personal property protection	2	2	1	1	1	**1.55**
4: Promote and advise on floodproofing	2	3	4	2	2	**2.65**
5: Continue acquisition and demolition	5	4	5	4	4	**4.50**
6: Prioritize drainage-related CIP projects	4	2	2	3	4	**2.95**
7: Encourage property owners to elevate mechanical equipment	2	2	3	2	1	**2.10**
8: Encourage renters to purchase flood insurance	2	2	3	2	2	**2.20**

3 References

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Appendix A – Building Survey Data

Note: In accordance with the Privacy Act of 1974, Appendix A will not be shared with the general public.