Repetitive Loss Area Analysis

Thurston County Areas

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Introduction

Thurston County has faced flooding problems for many years. The Southwestern corner of the County has been repeatedly flooded by the Chehalis River and the Black River, a tributary to the Chehalis River. Because of the severe nature of flooding in the Chehalis Valley, the Chehalis River Basin Flood Authority was created in 2007 to develop flood hazard mitigation measures to protect the communities and developments in the basin.

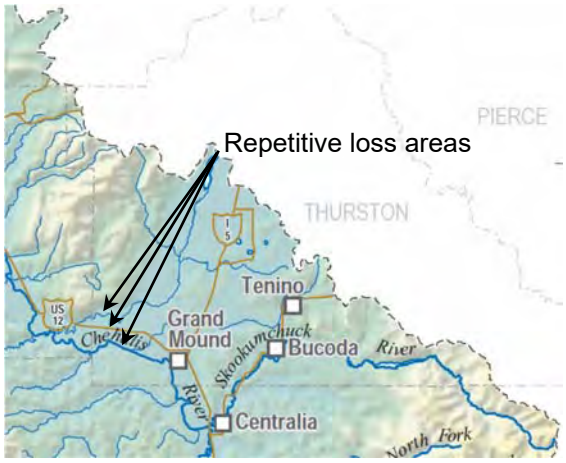
In 2014, the Flood Authority initiated an analysis of the repetitive aspect of floods in the Basin, primarily to reduce the impact of chronic flooding. A secondary reason was to take advantage of some of the Federal Emergency Management Agency (FEMA) programs that put a priority on mitigating losses from repetitive flooding. FEMA's concern is that while only 1.3% of all the policies in the National Flood Insurance Program (NFIP) cover repetitive loss properties, those properties are expected to account for 15% to 20% of future claim payments.

The Flood Authority's "Chehalis River Basin Repetitive Flood Loss Strategy" was published November 30, 2104. The report provides an overview of repetitive flooding and proposes a strategy for reducing the problem. The first four recommendations for local programs were:

1. The programs should include activities from all four of the loss reduction tools: regulations, flood control, retrofitting, and public information.
2. The Community Rating System was made to encourage and support the types of efforts reviewed here. Communities should use the CRS for guidance and to gain support for implementing the planning, regulatory, retrofitting, and public information activities recommended by this report.
3. Communities should start by preparing a repetitive loss area analysis for each area.
4. Loss reduction projects should involve the property owners as much as possible. They are vital to any retrofitting and some mitigation measures can be implemented by owners without government funding.

The Strategy identified 55 "repetitive loss areas" areas in the Chehalis River Basin that had a history of repetitive flood insurance claims. The extra resources provided by the Flood Authority allowed Thurston County to focus attention on the flooding problems within the Basin, i.e., the southwestern portion of the County.

Three repetitive loss areas were identified based on the flood insurance claims history. This report describes the flood problems faced in these three areas, reviews alternative approaches to reduce flood losses, and recommends actions to be taken by the property owners and the County.



Chehalis River Basin in Thurston County

The Process

This report follows a planning process described in the Community Rating System that will qualify the County for credit under that program. The process has five steps:

1. Advise the residents about the analysis. On July 14, 2015, a letter was sent to the 32 initially identified properties in the three repetitive loss areas (see Appendix A). The letter included a request that the recipient complete a "data sheet" with information on past flooding. Unfortunately, only three of the 32 residents returned completed forms.

   During the field work, additional properties were added to the areas. The original 32 properties increased to 47 primary buildings exposed to the same flood problem. A second notice was necessary to ensure that everyone affected had a chance to comment. It was sent on *[date to be completed later]*, 2016, with a copy of a draft of this report.

2. Check with other agencies and review existing plans. Contacts were made with Thurston County's Resource Stewardship Department and Emergency Management, the Flood Authority, and the Washington Department of Ecology. There are Basin-wide and County level reports and applications for mitigation grants, but no site-specific flood protection reports or plans.

3. Collect data on each building. The three areas were visited on August 4 and 26. Basic data on each building was recorded. This was a "windshield survey" and did not involve going onto private property. It was these visits that determined the final delineation of the three areas.

   The data collected are summarized in the tables in Appendix B. *The data in Appendix B is draft based on the windshield survey. Additional data or corrections should be submitted by the property owners.* Flood insurance claims data were also reviewed, but those numbers are not in Appendix B because of the Privacy Act (see box).

4. Review alternative measures. The Strategy recommends that a variety of approaches should be reviewed. These are discussed on pages 9-16 of this report.

5. Document the findings. This report is the document with the findings. A draft was sent to the property owners and comments were used in preparing the final report. For CRS credit, the report and its recommendations need to be adopted by the Thurston County Board of County Commissioners.

The Privacy Act

Flood insurance claims data contain information about private property that is protected under the Privacy Act of 1974. The Privacy Act means:

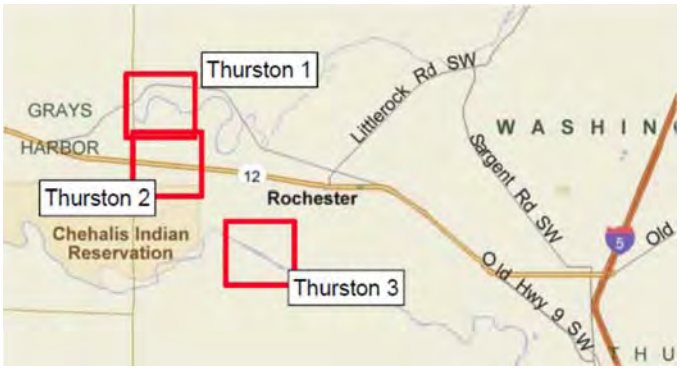
> Personally identifiable Information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims may not be released outside of local government agencies or to the public or used for solicitation or other purposes. General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property may be made public. – 2013 *CRS Coordinator's Manual*, page 500-9.

NFIP claims data are secured and not included with this report. This report only provides aggregate data, as required by the Privacy Act.

The Areas

There are three designated repetitive loss areas in Thurston County's portion of the Chehalis River Basin. While subject to different flooding sources, they are not far apart and they share similar building types and likely protection measures. All 47 primary buildings are single family homes. Therefore, all three areas are addressed in this one report.

The areas to be addressed were initially identified in the 2014 Strategy and designated Thurston 1, 2, and 3. The identification was based on flood insurance claims data and a relatively quick visit to the sites. The list of properties included in each area was refined after the August site visits.



Areas 1, 2, and 3 in the "Repetitive Flood Loss Strategy"

Area 1
Area 1 consists of three properties between 170th Ave SW and the Black River. The area is shown in the aerial photograph below.

Repetitive Loss Area 1 on the Black River

A total of five flood insurance claims have been paid for two of the buildings. All three are on elevated foundations and two of them appear to be elevated at or above the base flood elevation (the 100-year flood elevation used for flood insurance rating).

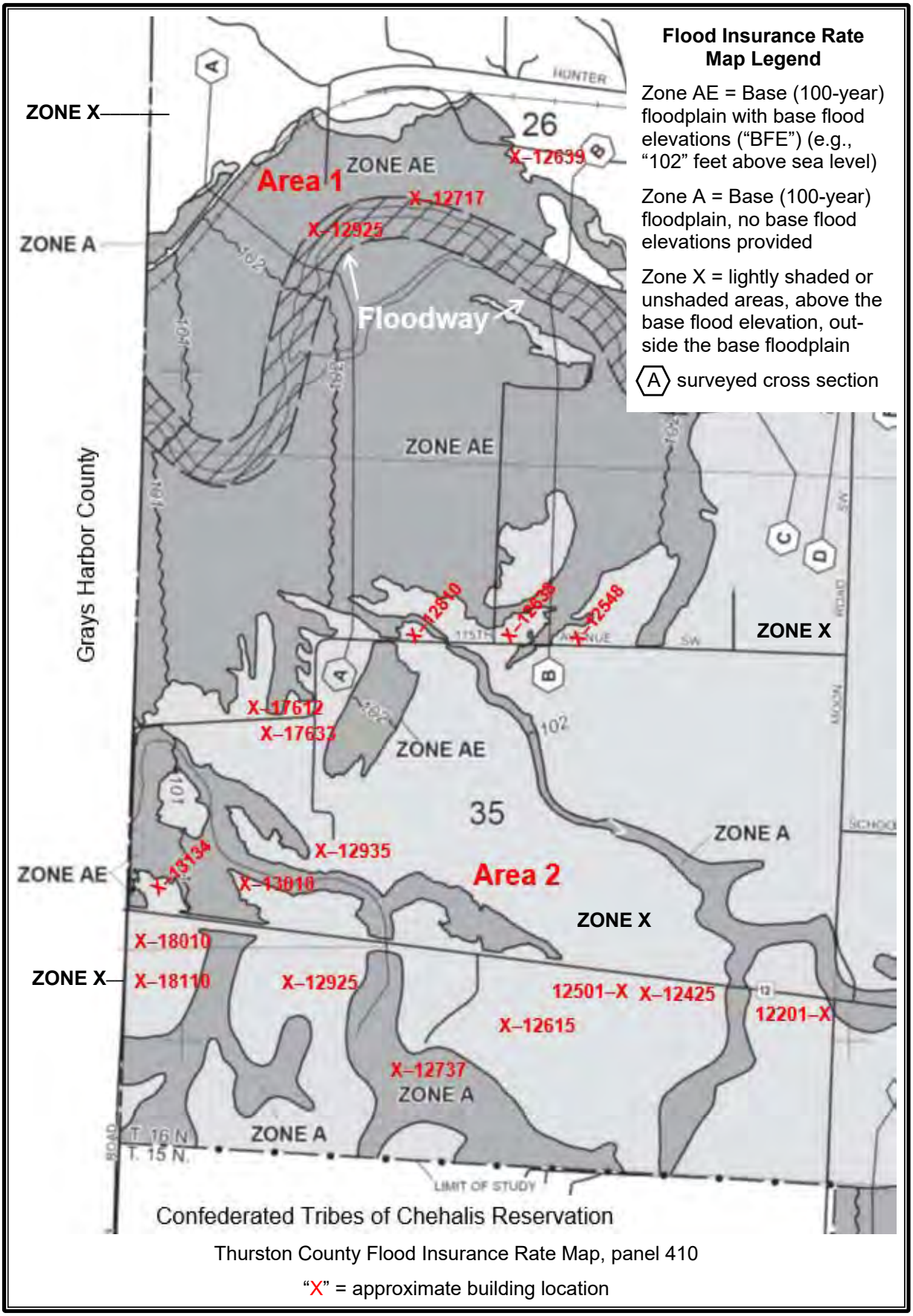
12925 is close enough to the river channel to be in the floodway (see map, page 5). The field data and recommendations for each building are in Appendix B.

Area 2
Area 2 is south of Area 1, along US Highway 12. It is on higher ground away from the Black River channel, but portions are in the floodplain of the Black and Chehalis Rivers or their tributaries. Several properties are outside the FEMA-mapped floodplain (see page 5), but the returned data sheets and flood claims show they are still subject to flooding.

Repetitive Loss Area 2

There are 16 buildings in this area. Seven of them have received a total of 13 flood insurance claim payments. Four of them are currently owned by the Chehalis Tribe. There were no data collected on these four properties because they are outside the jurisdiction of Thurston County. Of the remaining twelve, one has reportedly been vacant since the 2007 flood. The rest are in good condition. Five of the 12 Area 2 buildings are above the base flood elevation according to the current Flood Insurance Rate Map.

Most of the homes are on crawlspaces or other foundations that facilitate elevating the structure above flood levels. They are in a mix of flood insurance rate map zones, including AE (in the base floodplain, with a base flood elevation), A (in the base floodplain, without a base flood elevation), and X (outside the base floodplain). The floodplain boundaries are shown in the excerpt from the Flood Insurance Rate Map on the next page.



Thurston County Flood Insurance Rate Map, panel 410

"X" = approximate building location

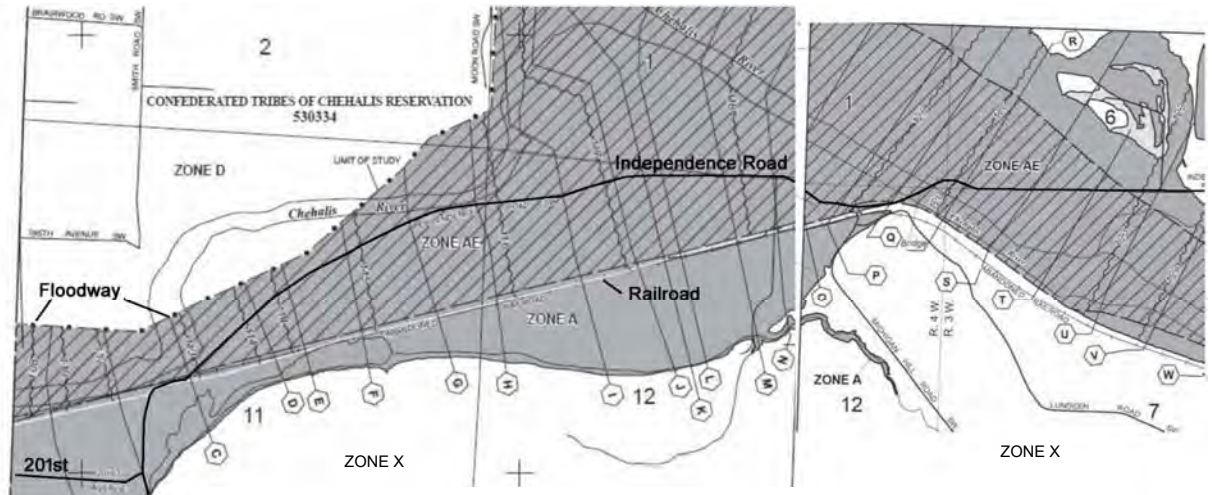
Area 3

Area 3 is south of Area 2. It stretches for 2½ miles along Independence Road SW from the Grays Harbor County line to the east. There are 24 parcels with 28 buildings. Thirteen of the buildings have received a total of 19 flood insurance claim payments.

As seen on the Flood Insurance Rate Map excerpt on the next page, all of the properties in Area 3 north of the railroad are in the AE Zone floodplain (see "FIRM Terms" box, page 8). Five of the 28 buildings are in Zone A, south of the railroad. All but six buildings are in the Chehalis River's floodway (see next page).

Repetitive Loss Area 3, western part

Repetitive Loss Area 3, eastern part



Thurston County Flood Insurance Rate Map, panels 420 and 440

See FIRM legend, page 5

The Flood Problem

The primary cause of flooding in the three areas has been overbank flows from the Black and Chehalis Rivers. There is no gage on the Black River, but there is a new gage on the Chehalis at Independence Road. There is a gage at Grand Mound on Prather Road, about 5 miles upstream from Independence Road, that has records since 1928.

River gage records are in terms of "stage." River stages are in feet above an arbitrary starting point at a gage, usually the bottom of the channel. For the Grand Mound gage, a stage of zero feet equates to 123.65 feet above sea level (NGVD). The 100-year (base) flood elevation at the gage is 142.85 feet NGVD or a stage of 19.2 feet.

The National Weather Service identifies three flood stages:

→ 14.0 feet – Flood stage

→ 15.5 feet – Moderate flood stage

→ 17.0 feet – Major flood stage

The Chehalis has exceeded the "major flood stage" of 17 feet 15 times since the gage was installed in 1928 (see box, right). Nine of those floods have occurred in the last 25 years, or an average of one "major flood" every three years.

Historic Flood Crests
Chehalis River at Grand Mound

(1) 20.23 ft on 12/04/2007
(2) 19.98 ft on 02/09/1996
(3) 19.34 ft on 01/10/1990
(4) 18.41 ft on 11/25/1986
(5) 18.39 ft on 12/29/1937
(6) 18.21 ft on 01/21/1972
(7) 18.18 ft on 01/08/2009
(8) 18.12 ft on 11/25/1990
(9) 17.73 ft on 12/05/1975
(10) 17.66 ft on 04/06/1991
(11) 17.46 ft on 02/11/1990
(12) 17.29 ft on 12/30/1996
(13) 17.29 ft on 01/26/1971
(14) 17.08 ft on 01/23/1935
(15) 17.04 ft on 11/26/1998

The highest recorded flood was in December 2007. This is known as the "flood of record." At the Grand Mound gage, it was one foot higher than the base flood elevation.

Here is the Weather Service's description of the impacts of flooding at the 17.5 and 19 stage levels (Source: http://water.weather.gov/ahps2/hydrograph.php?wfo=sew&gage=cgmw1).

> 17.5 feet – the Chehalis River in Thurston County will cause major flooding...inundating roads and farm lands in Independence Valley. Deep and swift flood waters will cover SR-12 and James... Independence and Moon Roads. Flooding will occur all along the river including headwaters...tributaries...and other streams within and near the Chehalis River Basin.
>
> 19 feet – the Chehalis River in Thurston County will cause severe near record flooding...with deep and swift flood waters inundating the Independence Valley. Flooding will occur all along the river including headwaters...tributaries...and other streams within and near the Chehalis River Basin.

Floodplain Maps and Flood Levels

For the purposes of this area analysis, there are two relevant floodplain maps.

1. The Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM), effective October 16, 2012. Excerpts are on pages 5 and 7. The three repetitive loss areas are on panels 410, 420, and 440.

   The current FIRM is the map used for setting flood insurance premium rates. Building regulations are enforced in the AE and A Zones (see "FIRM Terms"). There is a preliminary FIRM dated December 19, 2014, but the base flood data for the Black and Chehalis Rivers did not change.

FIRM Terms

FIRM = Flood Insurance Rate Map. Excerpts are on pages 5 and 7.

BFE = Base (100-year) flood elevation. BFEs are in feet above sea level.

Zone AE = Base floodplain with base flood elevations ("BFE"). The "E" stands for elevation.

Zone A = Base floodplain, no base flood elevations provided.

Zone X = Unshaded areas above the base flood elevation, outside the regulatory floodplain

Zone D = the flood hazard is "undetermined, but possible." This zone only appears in the Chehalis Reservation.

2. A map of the December 2007 Chehalis River flood of record, recently prepared by Watershed Science & Engineering for the Flood Authority. This map shows the area inundated on the Chehalis River and on some of the tributaries, based on backwater from the Chehalis.

   In Areas 1 and 2, the flood of record on the Black River was roughly two feet higher than the base flood elevation shown on the 2012 FIRM. For example, on the FIRM, the BFE in Area 1 (page 5) is approximately 102 feet above sea level. On the flood of record map, it is approximately 104 feet.

   In Area 3, the crest of the flood of record on the Chehalis River at the Independence Road bridge was less than a foot higher than the BFE at that location. Downstream, it was lower.

As explained in the next section on regulations, Thurston County's Code of Ordinances require new construction in the AE and A Zones to be protected to a level of two feet above the BFE or the flood of record, whichever is higher. This means that in the three repetitive loss areas, the elevations in the December 2007 map are used for regulatory purposes. The FIRM is still used for insurance rate setting, which results in even lower premiums for buildings built to the County's standards.

Flood Protection Measures

The "Chehalis River Basin Repetitive Flood Loss Strategy" recommends four general approaches to reducing flood losses: regulations, flood control, retrofitting, and public information. These are reviewed in this section.

Building Regulations
There are three types of construction regulations that can prevent or minimize the damage caused by flooding. These are spelled out in more detail in the Strategy.

1. Post-FIRM standards. Buildings constructed after the date of the community's Flood Insurance Rate Map (FIRM) must meet FEMA's and State minimum construction criteria. The date of Thurston County's first FIRM is December 1, 1982. Most of the buildings in the three repetitive loss areas were constructed before 1982 and, therefore, did not incorporate flood protection measures.

   The FIRM shows a base flood elevation in AE Zones. A rough base flood elevation is shown in the "BFE" column in the tables in Appendix B. The exact BFE is determined by the County at the time of permit application. There are properties in Area 2 that are in A Zones and X Zones where there are no BFEs on the FIRM. North of Highway 12, Appendix B uses the BFE from the nearest AE Zone.

   Thurston County has added several beneficial provisions that provide a greater level of flood protection than the minimum State and Federal criteria. These are spelled out in Chapter 14.38 Development in Flood Hazard Areas of the County Code of Ordinances.

   As noted above, the BFE on the FIRM does not provide protection to a repeat of the 2007 flood. The Flood Authority policy is that communities should regulate to the BFE or the flood of record, whichever is higher. That is also the language in Thurston County's Code of Ordinances, Section 14.38.050.B.1.a:

   a. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated two feet above the base flood elevation, or the highest known recorded flood elevation, whichever is greater.

   This is an excellent provision in these repetitive loss areas, where the Flood Insurance Rate Map's protection elevation is two feet below the highest known recorded flood elevation.

   There is also a State requirement that construction or reconstruction of residential structures is prohibited within designated floodways (WAC 173-158-070). There are three exceptions that affect the existing buildings, especially in Area 3. The following situations are exempt from this floodway rule:

   → Repairs, replacement, reconstruction, or improvements to existing farmhouses located on designated agricultural lands that do not increase the building's total square footage of encroachment,

→ Repairs, replacement, reconstruction, or improvements to substantially damaged residential dwellings other than farmhouses that do not increase the building's total square footage of encroachment, and

→ Repairs, reconstruction, or improvements to residential structures identified as historic structures that do not increase the building's dimensions.

While such repairs, replacement, reconstruction, or improvements can be implemented for residential buildings in the floodway, the projects must still meet all the other regulatory requirements.

Studies indicate that post-FIRM standards work well in reducing flood damage. The best measure of the effectiveness of these standards is the NFIP insurance premium rate structure for post-FIRM buildings. Premiums reflect risk of damage and they are significantly lower for buildings that are elevated to or above the BFE. While meeting the flood protection requirements for post-FIRM buildings means a bit more in construction costs, they save more in the long run through reduced insurance premiums.

2. Building enclosure requirements. The NFIP's post-FIRM standards require that any area below an elevated building located in an A or AE Zone must meet the following standards;

→ There must be openings that allow floodwaters to freely flow in and out to minimize the pressure of floodwater. The openings must meet size and location specifications.

→ Enclosed areas are to be left unfinished and all materials below the BFE must be water-resistant.

→ Uses of enclosed areas are limited to building access (foyers, stairwells), parking, limited storage, and crawlspaces.

→ Utilities, including appliances and service equipment, must be elevated above the BFE.

An elevated house on Independence Road. Note the openings close to the ground.

The most common problem with elevated buildings is improving the lower area, below the originally intended finished floor. If the lower area is seven feet high or more, owners who have forgotten the last flood (or have not been flooded since they purchased the property) are often tempted to remodel it to gain more living space. They replace bare walls and floors with damageable carpeting, furniture, insulation, and even plumbing fixtures.

This house on Independence Road was elevated eight feet. The next owner may be tempted to convert the lower floor into a finished area, subject to flood damage.

Some communities prevent this problem with a requirement that the owner sign a non-conversion agreement and record a deed restriction that specifically notifies future owners about the limitations on enclosures. Some agreements allow the community to inspect the lower area periodically or at the time of resale to ensure compliance.

There are only a few instances of buildings elevated more than seven feet above grade in the repetitive loss areas (see the "Above grade" column in Appendix B). However, future elevation projects could well go that high when the owner would like to use the lower area for a garage and storage.

3. Substantial improvement and substantial damage requirements. There are no regulatory requirements for an existing or pre-FIRM building, unless the owner wants to remodel or has to repair it. At the time of a permit application a substantial improvement or substantial damage determination must be made. Here are the definitions:

> "Substantial Improvement" is defined as any repair, reconstruction, rehabilitation, addition or improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the improvement or repair is started.
>
> "Substantial Damage" occurs if an existing building is damaged by any cause and the cost of repairing it to the pre-damage condition equals or exceeds 50 percent of the building's market value (prior to the event).

If an existing building undergoes improvements that qualify as a substantial improvement, the regulations require that the building be brought into compliance with the post-FIRM standards discussed above. For most residential buildings, this results in elevating the structure, filling in any existing subgrade basement, and/or moving equipment and ductwork out of a crawlspace. The same applies for a substantially damaged building, but the owner may opt to demolish the structure and rebuild it to meet all building code and floodplain management requirements.

In Section 14.38.020 Definitions is a provision in that counts improvements and damage costs over time to prevent an owner from getting around the rule by submitting plans for a project worth less than 50% of the building and then applying later for another permit to complete the project. This is an important provision that a buyer should be aware of.

4. Conclusion and recommendations.

   a. Building regulations can prevent damage to new construction from the base flood. They can also mandate flood protection when there is a substantial improvement or substantial damage.

   b. Thurston County has very good regulatory standards, but should consider requiring a non-conversion agreement when an elevated building will have an enclosed lower area higher than seven feet. The Community Rating System provides credit if a four feet threshold is used.

Flood Control Measures
Flood control projects modify flood flows and reduce the level of flooding. These are public projects and are constructed at some distance from the protected properties. Examples include:

→ Flood control dams

→ Detention/retention basins

→ Levees and floodwalls

→ Channel modifications

→ Modifications to bridges and culverts to alleviate backwater flooding

Flood control projects are usually preferred by property owners because flooding is "fixed" with little disruption to the neighborhood and residents. However, flood control projects have their limitations. The most important being that they are very expensive and they often disturb the land and disrupt natural water flows, which can negatively impact fish habitat and natural and beneficial floodplain functions.

A project big enough to control flooding in the Black or Chehalis Rivers would be very expensive and would need outside funding support. Most government flood control funding programs require an evaluation to determine if the benefits of a proposed project exceed the cost. When there are relatively few benefiting structures, spread out over an area, the benefit/cost analyses usually conclude that the costs outweigh the benefits.

Several proposed flood control projects are being evaluated by the Flood Authority. One, a proposed retention dam on the upper Chehalis River, is estimated to be able to lower a repeat of the 2007 flood by two feet in Area 3. It would likely reduce flood levels of the Chehalis and Black Rivers in the other two areas, too.

Conclusion and recommendations. There is the possibility of a flood control project that would reduce, but not eliminate flooding in the areas. Such projects take years to design, fund, and build, and there is no guarantee that they would be approved by the funding agencies. Therefore, it is recommended that the County and property owners also pursue the other mitigation measures in the interim.

Retrofitting
There are 47 primary buildings in the three repetitive loss areas. Two of them are on slab foundations, but they are above the BFE. The rest are on crawlspaces, piers, or are single or double wide manufactured homes. These are considered elevated foundations. There are three basic ways to reduce flood damage to a building on an elevated foundation:

1. Remove the structure from harm's way
2. Elevate it above flood levels
3. Wet floodproof the area below the first floor

1. Removal. Under this measure, either the property is acquired and the building demolished or the building is detached from its foundation and moved to a location outside of the floodplain. This is the best retrofitting measure in high hazard areas, such as high velocity or deep flooding floodways.

   Removal is the best approach for dilapidated or unsound structures. Because of this, it is recommended for one vacant building in Area 2 and two vacant buildings in Area 3 (see Appendix B, "Recommendation" column).

   There are two main problems with removal: the cost and what to do with the vacated land. There are grants from FEMA and, possibly, the Flood Authority, to help cover the costs. FEMA acquisition grants require that the land be held by a public agency as open space. While, FEMA has funded an approach called "mitigation reconstruction," where an existing building is replaced with a new elevated building on the same site, this program is not available for building sites in a floodway.

2. Elevation. With this measure, all damage-prone parts of the building are elevated above the flood protection level on a foundation intended to resist flood damage.

   There are several advantages of elevation over other retrofitting methods:

   → The building meets the post-FIRM flood protection standards

   → Flood insurance premium rates are reduced

   → It is less expensive and disruptive for buildings on crawlspaces and elevated foundations

   → The measure has been used on a good number of buildings in the three areas, so it is less likely to be viewed as an extreme approach that will hurt property values

   → The buildings remain, retaining the local tax base and neighborhood integrity

   Elevating a building can be expensive, but there are sources of financial assistance from FEMA grants and the Increased Cost of Compliance provision in a flood insurance policy. The latter is available provided there is a flood insurance policy on the building and a flood causes substantial damage.

Any kind of structure can be elevated, but wood frame houses on crawlspaces are the easiest.

3. Wet floodproofing. Wet floodproofing allows water to enter a floodable area, such as a crawlspace, but damageable items are removed or elevated and the finishings, contents, and use of the interior are modified so damage is prevented or minimized.

   Wet floodproofing works best to protect utilities and other items located in a crawlspace, garage, or other part of the building below the first floor. It works best if flooding is slow-moving and the building is structurally sound. Advantages of wet floodproofing measures include:

   → They are generally inexpensive.

   → Some measures can be undertaken by the owner.

   → The projects do not usually affect the exterior appearance of the building.

   → If the first floor is at or above the BFE, a properly wet floodproofed building will have a lower flood insurance premium rate. There is a Flood Authority project currently underway that will reduce flood insurance premiums on buildings that are being wet floodproofed in Bucoda.

The washer, dryer, and water heater were elevated in this wet floodproofed garage.

4. Retrofitting recommendations by building.

   a. Where flooding cannot be controlled, retrofitting measures offer the best alternative for reducing damage to existing buildings.

   b. Appendix B lists the data collected on each building in the three repetitive loss areas. It does not include flood insurance claims information, which is protected by the Privacy Act. Codes used in the building data tables are explained at the bottom of the first page of Appendix B.

   c. The far right column in the building data tables lists the recommended retrofitting approach for the primary residence at each address. These recommendations are based on the following guidance:

      1) A vacant or abandoned building should be removed if the first floor is below the base flood elevation (i.e., "1st floor > Depth" is a negative number).

      2) An occupied building on a crawlspace or double wide foundation with a first floor one foot or more below the base flood elevation should be elevated.

      3) Buildings that have recently been elevated to the code required elevation and buildings close to or above the base flood elevation are listed as "OK," meaning no action is recommended. However, the owners should ensure that the enclosed area below the first floor is properly wet floodproofed.

4) Buildings in Repetitive Loss Area 2 owned by the Chehalis Tribe are listed as "N/A" because they are under another jurisdiction.

5) In some cases, not enough information can be collected by a windshield survey and the recommendation is to talk to the owner about what appears to be a local drainage problem.

d. These recommendations are provided as food for thought for the property owner. There are no plans to mandate removal or retrofitting. However, if a building in an A or AE Zone is substantially damaged or substantially improved, it will need to be elevated at least two feet above the base flood elevation or the flood of record, whichever is higher.

e. If a property owner is interested in learning more about these recommendations and possible financial assistance for retrofitting, he or she should contact Tim Rubert at the Resource Stewardship Department, 360/754-3355 or rubert@co.thurston.wa.us.

Public Information

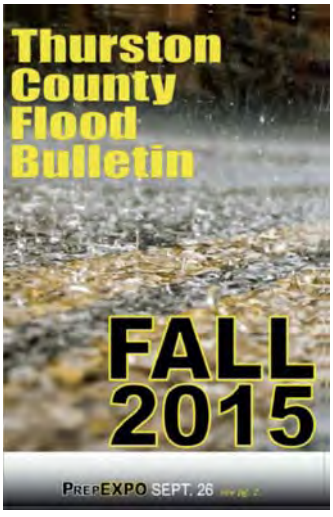
Disseminating information is a vital part of any repetitive flooding mitigation program for two reasons. First, those affected by the program need to know the hazard they face and what they can do. As with any government program, the support and cooperation of all parties is essential for effective implementation.

Second, information dissemination can bring about voluntary mitigation activities at little or no cost to the government. People implemented flood mitigation projects long before there were FEMA regulations and funding programs.

There are two key parts of an effective information dissemination program: the messages and the ways they are disseminated. The "Chehalis River Basin Repetitive Flood Loss Strategy" provides more details on five messages that are appropriate for an information program for repetitive flooding:

1. The repetitive flood hazard, including what flooding does to buildings, their contents, and their occupants
2. Ways to mitigate the impact of repetitive flooding
3. Where to get help to mitigate the problem
4. Relevant building regulations
5. Flood insurance

Lessons have been learned from experiences of, and research by, FEMA and the American Red Cross. The messages need to be clear, focus on the benefits of mitigating, and be repeated by different parties, including elected officials, government staff, building contractors, insurance agents, and others who communicate with property owners. They can be broadcast to everyone in a repetitive loss area via:



The County's annual bulletin gets basic information to a wide audience

→ News releases, newspaper articles, and public service announcements

→ Brochures and booklets (see example, right)

→ Mailings sent directly to owners of repetitive loss properties

→ Presentations at service organizations, homeowners' associations, and other meetings likely to be attended by the owners

→ Information inserted in utility or tax bills

→ Open houses and home improvement fairs, such as the Prep Expo sponsored by the County in the Fall

When property owners hear the basic messages and decide to investigate further, there needs to be additional sources of information. These could include:

→ Putting reference materials in the local library and/or sending them directly to requestors

→ Developing a website on appropriate measures and links to more information

→ Visiting repetitive loss properties and offering mitigation suggestions to the owners

The County's annual bulletin explains general concepts of retrofitting, and tells readers where to get more information

Thurston County currently implements a variety of public information approaches to disseminate similar messages and has more information available on some of the topics in the libraries and on its website, www.co.thurston.wa.us/em/Flood/FloodInfo.htm. However, these could be refined to better meet the needs of the repetitive loss areas.

The County also offers a flood protection assistance service, where staff will talk to an interested property owner about their flood situation and what can be done. All of these public information activities are being credited under the Community Rating System.

Conclusions and recommendations.

a. Public information efforts work. Research has shown that educating people about their repetitive flood hazard can motivate them to take steps to protect themselves and their properties. Thurston County conducts public information activities in accordance with these guidelines.

b. The one recommendation for change would be to devote more attention directly to the property owners in the repetitive loss areas. This could be in the form of neighborhood meetings, one-on-one meetings with interested residents, and site visits to their homes. A start will be the distribution of this report to all the residents.

Recommended Action Plan

This section converts the general recommendations in the previous sections to specific actions that can be taken by the County and the property owners to reduce the hazard and damage caused by repetitive flooding. The action items are designed to show who is responsible for implementing the action, when it will be done, and how it will be funded. This approach facilitates monitoring and evaluation of progress.

Actions by the Flood Authority

1. Continue to pursue construction of the flood retention dam on the Chehalis River and keep residents apprised of progress.

   Responsible office: Chehalis River Basin Flood Authority

   Timing: Ongoing

   Funding: Staff time

2. Develop a program of funding support for retrofitting projects that are not eligible under other programs.

   Responsible office: Chehalis River Basin Flood Authority

   Timing: Developed and operational by Summer 2015

   Funding: Flood Authority biennial budget

Actions by the County

3. Develop a non-conversion agreement template for use when a building is elevated four or more feet above grade.

   Responsible office: Resource Stewardship Department

   Timing: By June 2016

   Funding: staff time

4. Provide advice and assistance to repetitive loss area property owners who are interested in flood protection in three ways:

   1) An annual mailing to all owners that reminds them of the hazard and possible retrofitting measures
   2) A repetitive loss web page that includes this report and links to relevant information, such as references on the retrofitting measures
   3) An offer to meet one-on-one with interested property owners

   Responsible office: Resource Stewardship Department

   Timing: These would be ongoing services to be initiated after adoption of this report.

   Funding: staff time

5. Seek funding support to assist property owners implement the retrofitting measures recommended in Appendix B.

   Responsible office: Resource Stewardship Department and Emergency Management

   Timing: This would be initiated after meeting with interested owners to confirm the feasibility of a retrofitting measure and the owner's understanding of what would be involved.

   Funding: Funding should be sought from FEMA, the Flood Authority, and other sources.

Actions by the Property Owners

6. Review the alternative retrofitting measures and consider the best protection approach to a level of at least two feet above the 2007 flood.

   Responsible office: Each property owner, with advice and assistance from the Resource Stewardship Department

   Timing: As soon as possible, in case a property qualifies for funding under a program that has an application deadline

   Funding: Staff time.

7. Obtain and maintain a flood insurance policy on your property.

   Responsible office: Each property owner

   Timing: As soon as possible, in case a flood occurs during a lapse in coverage

   Funding: Owner

Appendix A. Letter to Area Residents

THURSTON COUNTY
WASHINGTON
SINCE 1852

COUNTY COMMISSIONERS

Cathy Wolfe
District One
Sandra Romero
District Two
Bud Blake
District Three

RESOURCE STEWARDSHIP DEPARTMENT
Scott Clark, Director

Creating Solutions for Our Future

July 14, 2015

Dear Resident:

Your area has been flooded several times. In cooperation with the Chehalis River Basin Flood Authority, Thurston County is exploring ways to reduce flood losses in your area. Our first step is to conduct an "area analysis" that looks into the causes and extent of flooding and alternatives to protect properties. We will use the findings to recommend next steps, some of which may be eligible for government funding.

This work would be much more effective with additional data that you could provide. Attached is a data sheet that we hope you will complete to provide us with more details on your situation. After you fill the form out, please mail it in the attached stamped envelope.

In the next few weeks, a representative of French & Associates and Thurston County will be in your area doing field data collection. This will include taking pictures from the street of each home and recording information like the foundation type and the estimated elevation above the street. They will not need to come onto your property if they can get a clear view of your house from the road. They will have identification cards if you want to talk to them.

If you would like to talk to the research team about your flooding experiences, this information would greatly enhance this project. The contact is French Wetmore at 253/753-6811 or French@FrenchAsoc.com. French can talk to you then or tell you when he will be in the area if you'd like to show him more information on site.

After the analysis is completed, some preliminary recommendations will be developed. You will be invited to a meeting with us and the field team to review the findings. You will get a notice of the meeting time and location once the analysis is near completion.

If you have any questions about this project, please feel free to call Tim Rubert at 360.754.3355 ext. 6647 or French Wetmore at 253/753-6811 or French@FrenchAsoc.com.
Thank you for your assistance in helping us to complete this project.

Sincerely,

Scott Clark
Director, Resource Stewardship

Attachment: Area Analysis Resident Data Sheet

2000 Lakeridge Drive SW, Olympia, Washington 98502 (360) 786-5490/FAX (360) 754-2939
TDD (360) 754-2933 Website: www.co.thurston.wa.us/permitting

Return form to:
Area Analysis Team
Tetra Tech & Associates, Ltd.
1610 Nisqually Street
Steilacoom, WA 98388

Area Analysis Resident Data Sheet

Note: Completing this form is voluntary.

Name: _____

Property address: _____

1. In what year did you move into this address? _____

2. What type of foundation does your house have? ☐ Slab ☐ Crawlspace ☐ Blocks
   ☐ Posts/piles ☐ Other: _____

3. Roughly how high above the ground is the lowest floor of your living space? _____

4. Has the property ever been flooded or had a water problem?
   ☐ Yes ☐ No (if "no," please skip to question **9**)

5. In what year(s) did it flood? (list all you remember) _____

6. What was the deepest that the water got?
   ☐ In yard only; how deep? _____ ☐ In crawlspace or lower level; how deep? _____
   ☐ Over the lowest floor of living space; how deep? _____
   ☐ Water kept out of the house or building by sandbagging or other protective measure:
   _____

7. What was the longest time that the water stayed in the building? ___ hours or ___ days
   What year was this? _____

8. What do you feel was the cause of your flooding? **Check all** that affect your building.
   ☐ Overbank flooding from nearby river/creek/ditch ☐ Sewer backup
   ☐ Clogged/undersized drainage ditch ☐ Standing water next to house
   ☐ Drainage from nearby properties ☐ Other: _____

9. Have you taken any flood protection measures on your property?
   ☐ Elevated all or parts of the building ☐ Waterproofed the outside walls
   ☐ Moved utilities/contents to a higher level ☐ Built a wall/berm to keep water away
   ☐ Regraded yard to keep water away from building ☐ Installed drains or pipes
   ☐ Sandbagged when water threatened ☐ Other: _____
   ☐ Taken **NO** flood protection measures

10. Did any of the measures checked in item 9 work? If so, which ones? If not, do you know why they didn't work?_____

11. Do you currently have Flood Insurance? ☐ Yes ☐ No

12. Are you interested in pursuing measures to protect your primary residential structure from flooding? ☐ Yes ☐ No

Please use this side for other comments about flooding in your area or your interests in flood protection for your property. Return form to:

Area Analysis Team
French & Associates, Ltd.
1610 Nisqually Street
Steilacoom, WA 98388

Appendix B. Building Data – Areas 1 and 2

Area Analysis Building Data																			
Tax Assessment Parcel Number	Street No.	Street Name	No. of Stories	Occ?	Walls		Foundation			Elevated		Flood Depth					Flood way?	Notes	Recommendation
					Type	Cond.	Type	Cond.	EC Diag	Above grade	Above street	BFE	LAG	Depth > LAG	WSE FFE	1st floor > Depth			
Area 1																			
14626320000	12925	Hunter	2	O	W	G	C	G	8	5	0	102	96.7	5.3		-0.3	Y	Elevated, in floodway	OK
14626310600	12717	Hunter	1	O	W	G	C	G	8	3	-1	102	98.7	3.3	101.8	-0.2	Y	Elevated, in floodway	OK
14626310100	12639	170th	1	O	DW	G	DW	G	8	3	-2	102	100.4	1.6		1.4		EC on file, 1st floor 0.44 > BFE	OK
Area 2																			
14635210000	17612	SW 175th	1	O	W	G	C	G	8	2	1	102	104.0	-2.0		4.0		3 feet above road in X Zone	OK
14635210000	17633	SW 175th	1.5	O	W	G	SL	G	8	0	0	102	101.9	0.1	102.9	0.9		Slab at road level	Get more info from owner
47300100102	12810	SW 175th	1	O	W	G	SL	G	1	1	0	102	102.6	-0.6	103.9	1.9		1st floor above BFE	OK
47300200202	12638	SW 175th	1	O	DW	G	DW	G	8	1	0	102	102.8	-0.8	104.3	2.3		1st floor above BFE	OK
47300200201	12548	SW 175th	1	O	W	G	C	G	8	2	-1	102	102.9	-0.9	103.4	1.4		Elevated (with County $)	OK
47301000200	13134	Highway 12	1	V	W	P	C	F	8	1	0	101	101.6	-0.6		1.6		Abandoned since 2007 flood, for sale	Remove
47301000100	13010	Highway 12	2	O	W	G	C	G	8	2	2	101	104.8	-3.8		5.8		1st floor above BFE	OK
47300900100	12935	SW 175th	1.5	O	W	G	C	G	8	2	2	102	102.8	-0.8		2.8		1st floor above BFE	OK
47301000300	18010	Anderson	2	V	W	G	C	G	8	XX	XX	XX	XX	XX		XX		Owned by Chehalis Tribe	N/A
47301100100	18110	Anderson	1	O	W	G	C	G	8	XX	XX	XX	XX	XX		XX		Owned by Chehalis Tribe	N/A
47301000400	12925	Highway 12	1	O	W	G	C	G	8	1	-1	X Zone	N/A	N/A		N/A		1 foot below road in X Zone	Elevate
47301200000	12737	Highway 12	1	O	W	G	C	G	8	XX	XX	XX	XX	XX		XX		Owned by Chehalis Tribe	N/A
14635430000	12615	Highway 12	1	O	W	G	C	G	8	XX	XX	XX	XX	XX		XX		Owned by Chehalis Tribe	N/A
14635430100	12501	Highway 12	1	O	DW	G	DW	G	8	2	0	X Zone	N/A	N/A		N/A		2 feet above road in X Zone	OK
14635420100	12425	Highway 12	1	O	W	G	C	G	8	2	-3	X Zone	N/A	N/A		N/A		1 foot below road in X Zone	Elevate
14635440100	12201	Highway 12	1	O	W	G	C	G	8	2	-1	A Zone	N/A	N/A		N/A		Local drainage?	Get more info from owner
Codes:																			
Occ?		O = occupied, V = vacant																	
Wall type		W = wood frame, DW = double wide, MH = manufactured home																	
Wall condition		G= good, F = fair, P = poor																	
Foundation type		C = crawlspace (including elevated on solid walls), P = piers, DW = double wide, SL = slab on grade, MH = manufactured home																	
Foundation condition		G = good, F = fair, P = poor																	
EC Diag		Diagram numbers used in FEMA Elevation Certificates: 1 = slab on grade, 6 = piers, 8 = crawlspace																	
Elevated		Numbers are in feet above adjacent grade and above the nearest public street																	
BFE		The base flood elevation is also known as the elevation of the 100-year flood, the basis for local regulations and flood insurance rating																	
		BFEs are only available where the property is within a floodplain where the base flood elevation was calculated (AE Zone)																	
		In some cases, the BFEs of the adjacent AE zone were used in A and X Zones																	
		BFEs are from the October 16, 2012, Flood Insurance Rate Map and are based on the North American Vertical Datum (NAVD 88)																	
LAG		The lowest adjacent grade was determined from LIDAR elevation data for the County																	
Depth > LAG		This is a rough estimate of how high the BFE is above grade. A negative number means the LAG is above the BFE																	
WSE FFE		Watershed Science & Engineering (WSE) estimated first floor elevations (FFE) for a number of the primary buildings on the parcels.																	
1st floor > Depth		This is a rough estimate of how high the first floor is above the BFE. A negative number means the first floor is below the BFE.																	
		Where there is a WSE FFE, that number is used for the floor elevation. Otherwise the 1st floor elevation is "elevated above grade" plus LAG.																	
Floodway?		The floodway is the channel and adjacent overbank floodplain that has deeper and faster moving floodwaters.																	
		New buildings and encroachments that can increase flood heights on other properties are not permitted in the floodway (WAC 173-158-070)																	
Notes		EC = FEMA Elevation Certificate																	

Area Analysis Building Data																			
Tax Assessment Parcel Number	Street No.	Street Name	No. of Stories	Occ?	Walls		Foundation			Elevated		Flood Depth					Flood way?	Notes	Recommendation
					Type	Cond.	Type	Cond.	EC Diag	Above grade	Above street	BFE	LAG	Depth > LAG	WSE FFE	1st floor > Depth			
14511320200	13136A	201st	1	V?	W	G	C	G	8	5	-1	109	106.7	2.3		2.7		Elevated foundation	OK
14511320200	13136B	201st	1.5	O	W	G	C	G	8	5	2	109	106.9	2.1		2.9		Elevated foundation	OK
14511320200	13136C	201st	1.5	O	W	G	C	G	5	4	-1	109	105.6	3.4		0.6		Elevated foundation	OK
14511310900	12744	Independence Road SW	1	O	DW	G	DW	G	8	9	-4	112	105.3	6.7		2.3		Elevated by owner	OK
14511310800	12648	Independence Road SW	1	O	DW	G	DW	G	8	8	-2	112	106.3	5.7		2.3		Elevated by owner	OK
14511110300	12408	Independence Road SW	1.5	O	W	G	C	G	8	2	0	115	110.7	4.3		-2.3	Y		Talk to owner
14511110200	12231	Independence Road SW	2	O	W	G	C	G	8	5	-2	115	109.9	5.1		-0.1	Y	Elevated with County $	OK
14511110100	12211A	House back off road	2	O	W	G	P	G	6	4	1	116	109.8	6.2		-2.2	Y	Elevated in 2007	OK
14511110100	12211B	Mobile home in front	1	V	MH	G	MH	G	8	3	1	116	109.0	7.0		-4.0	Y	Elevated by owner (when built?)	Remove
14511110501	12207	Independence Road SW	1	V	W	F	C	G	8	1.5	0	116	112.4	3.6		-2.1	Y	Roof has tarp on it	Remove
14512220200	12129 A	Elevated house	2	O	W	G	C	G	8	4	0	116	110.1	5.9		-1.9	Y	Elevated 2 feet above FOR, County $	OK
14512220200	12129 B	Double wide next door	1	O	DW	G	DW	G	8	2	0	116	110.2	5.8	112.7	-3.3	Y	Double wide on same parcel	Elevate
14512220201	12122	Independence Road SW	1	O	DW	G	DW	G	8	2	-1	116	112.9	3.1		-1.1	Y	Elevated 2 feet above FOR, County $	OK
14512220100	12013	Independence Road SW	2	O	W	G	C	G	8	5	-2	116	111.9	4.1		0.9	Y	Historic, elevated with County $	OK
14512210100	11841	Independence Road SW	1	O	DW	G	DW	G	8	1	1	117	112.7	4.3	114.3	-2.7	Y		Elevate
14501340100	11810	Independence Road SW	1	O	W	G	C	G	8	1	-2	117	113.6	3.4		-2.4	Y		Elevate
14501340000	11732	Independence Road SW	2	O	W	G	C	G	8	3	2	118	111.0	7.0		-4.0	Y	Elevated foundation	Elevate
14512210300	11717	Independence Road SW	1	O	W	G	C	G	8	2	1	118	113.5	4.5	115.5	-2.5	Y		Elevate
14501430000	11536	Independence Road SW	1.5	O	W	G	C	G	8	2	1	119	114.8	4.2	117.6	-1.4	Y		Elevate
14512110500	11509	Independence Road SW	1	O	DW	G	DW	G	8	3	0	119	114.6	4.4	117.2	-1.8	Y	Elevated 2 feet above FOR, County $	OK
14501430102	11500	Independence Road SW	1	O	DW	G	DW	G	8	2	0	119	115.7	3.3	118.1	-0.9	Y		Elevate
14501430101	11300	Independence Road SW	2	O	W	G	C	G	8	2	0	120	115.9	4.1	117.8	-2.2	Y	Owner says on National Register	Elevate
14512110300	11420	Independence Road SW	1	O	DW	G	C	G	8	2	2	119	117.5	1.5	119.8	0.8	Y		OK
14501440000	11202	Independence Road SW	2	O	W	G	C	G	8	2	1	120	114.1	5.9		-3.9	Y	Has violations, EC on file	Talk to owner
13506330000	11020	Independence Road SW	1	O	W	G	C	G	8	3	-1	121	116.2	4.8		-1.8	Y	Built to BFE + 1', EC on file	OK
13506330100	10940	Independence Road SW	2	O	W	G	P	G	8	4	-1	121	117.0	4.0		0.0	Y	Elevated 4 feet above grade	OK
13506340400	10910	Independence Road SW	1	O	W	G	C	G	8	2	0	122	120	2		0.0	Y		OK
13507210100	10805	Independence Road SW	1	O	W	G	C	G	8	4	1	123	120.7	2.3		1.7		Elevated 2 feet above FOR, County $	OK

See codes on previous page
FOR = flood of record, December 2007