

North Shore Levee

Cities of Aberdeen and Hoquiam



Design Funding:

- Chehalis River Basin Flood Authority

Design Team:

- KPFF Consulting Engineers
- Watershed Science & Engineering
- GeoEngineers
- Maul, Foster, & Alongi



Recap: Flood Risk

(December 10, 2015 *high tide*)



F Street in Aberdeen



Riverside Avenue in Hoquiam

Recap: Flood Risk

(January 4-5, 2015 rainfall event)



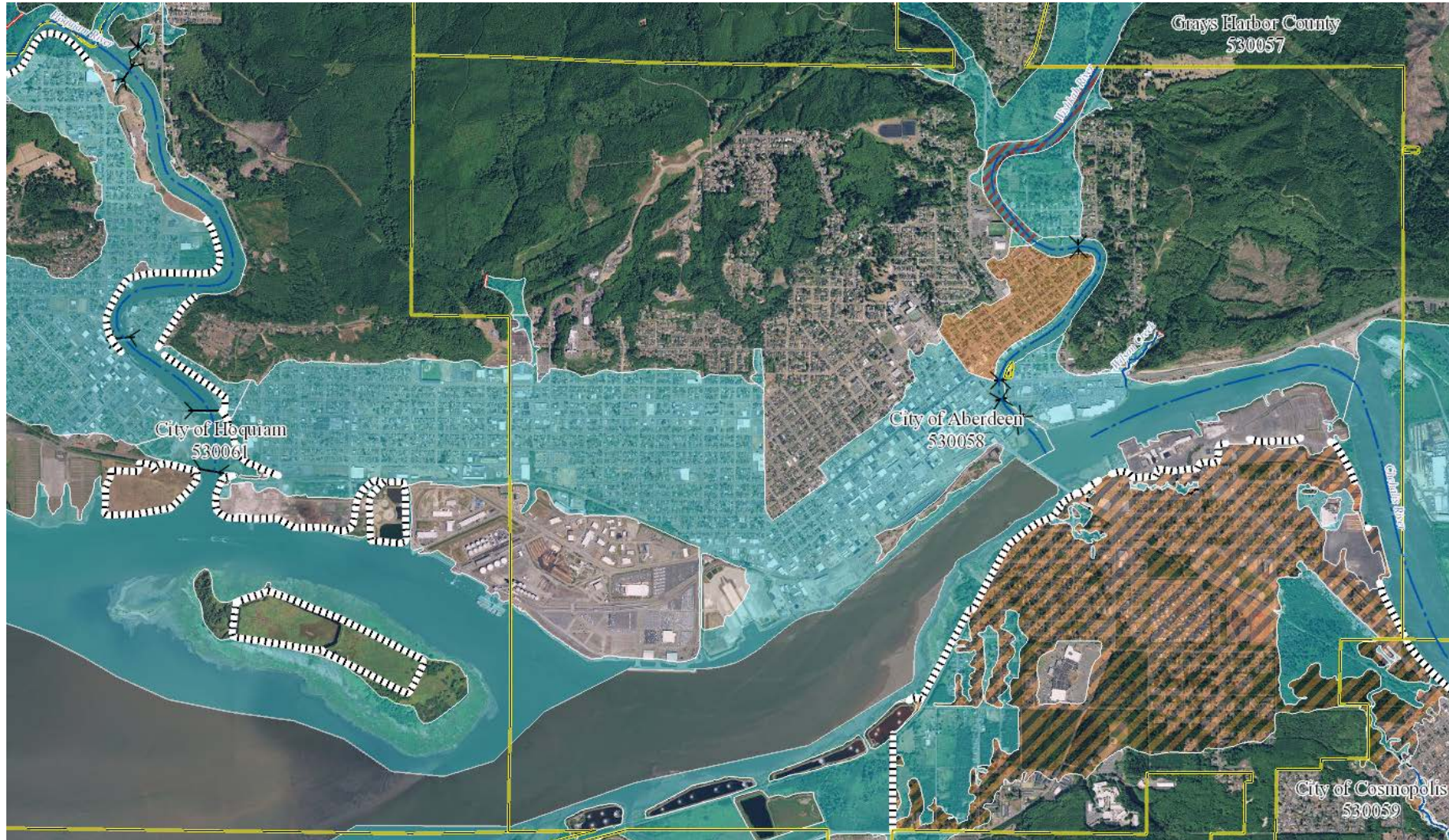
Conger Street in Aberdeen



Oak Street in Aberdeen

Recap: NFIP Regulations

(Blue = Special Flood Hazard Area)



NFIP Coverage as of 3/14/2018						
Community	Premium	V Zone	A Zone	X Zone	Total	Coverage
ABERDEEN, CITY OF	\$ 809,378	0	472	71	543	\$ 93,266,200
BUCODA, TOWN OF	\$ 40,210	0	40	7	47	\$ 7,590,100
CENTRALIA, CITY OF	\$ 641,138	0	470	257	727	\$ 167,272,200
CHEHALIS, CITY OF	\$ 351,758	0	206	27	233	\$ 66,348,300
COSMOPOLIS, CITY OF	\$ 4,968	0	4	7	11	\$ 1,898,800
ELMA, CITY OF	\$ 3,414	0	0	8	8	\$ 1,412,800
GRAYS HARBOR COUNTY*	\$ 409,975	13	151	258	422	\$ 95,629,100
HOQUIAM, CITY OF	\$ 971,404	0	649	14	663	\$ 85,003,200
LEWIS COUNTY *	\$ 748,587	0	529	468	997	\$ 236,337,800
MONTESANO, CITY OF	\$ 10,538	0	4	2	6	\$ 2,424,400
NAPAVINE, TOWN OF	\$ 351	0	0	1	1	\$ 280,000
OAKVILLE, CITY OF	\$ 3,762	0	0	6	6	\$ 1,648,100
PE ELL, TOWN OF	\$ 3,497	0	2	2	4	\$ 1,167,100
THURSTON COUNTY *	\$ 403,966	6	255	435	696	\$ 175,345,300
Total	\$4,402,946	19	2,782	1,563	4,364	\$935,623,400

Aberdeen and Hoquiam currently pay \$1.78 million in annual NFIP premiums for \$178 million in NFIP coverage. (Does not count private policies.)


North Shore Levee → Remove 3,100 properties from SFHA.



Design & Construction Process

1. Surveying, Modeling, & Analysis
 - Aerial photography and photogrammetry
 - On-ground topographic surveying
 - Bathymetric surveying
 - Hydrologic and hydraulic modeling
 - Geotechnical investigation
2. First Phase of Public Outreach, Government & Agency Coordination
3. Develop Preliminary Design & Science Package, Submit to FEMA
4. Receive Conditional Letter of Map Revision (CLOMR)
5. Second Phase of Public Outreach, Government & Agency Coordination
6. Final Design, Permitting, & ROW Acquisition
7. Construction
8. Levee Certification & Letter of Map Revision (LOMR) → Protected Areas Change from SFHA to Zone X

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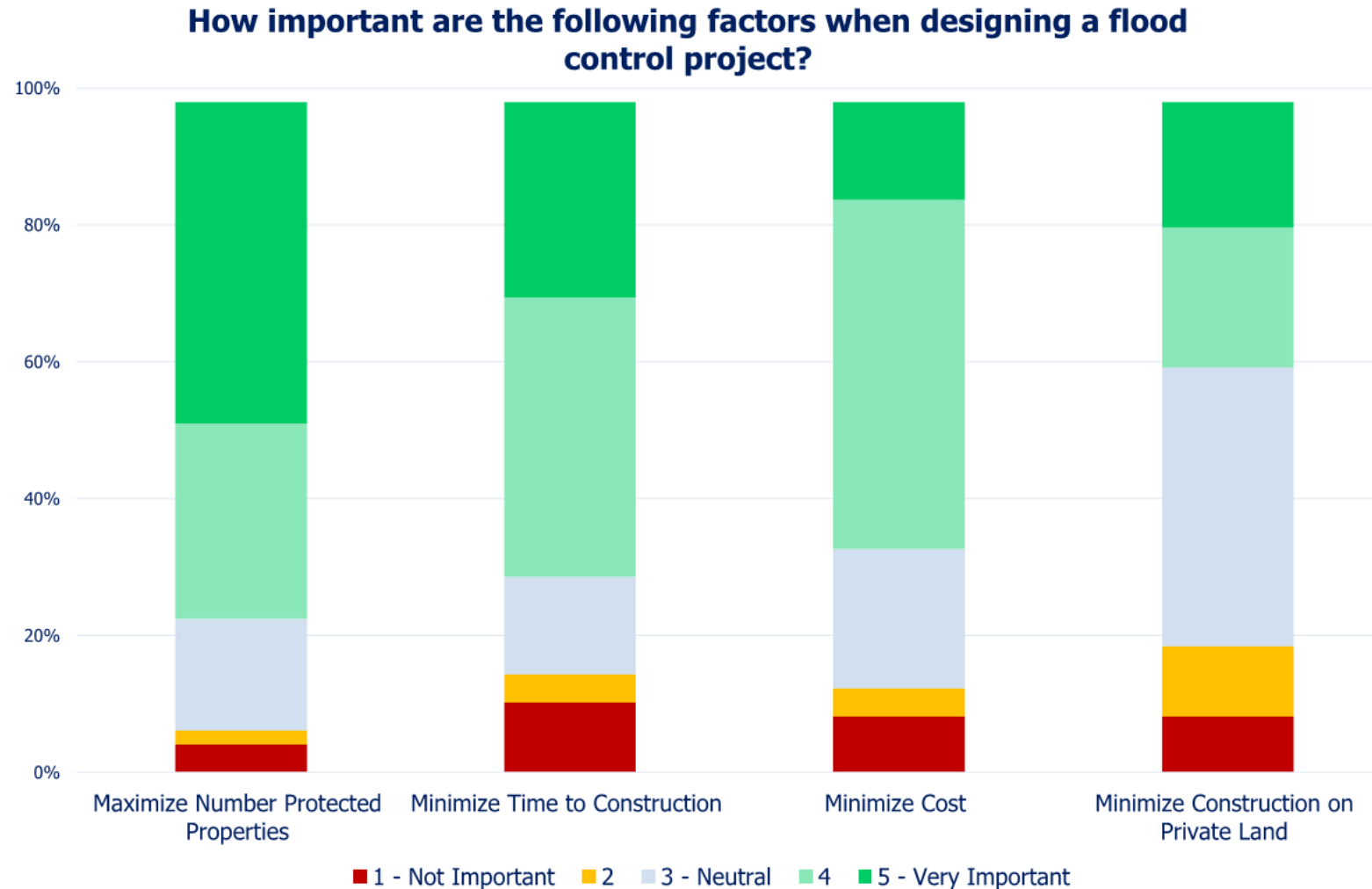
Work Completed

1. Surveying, Modeling, & Analyses ✓



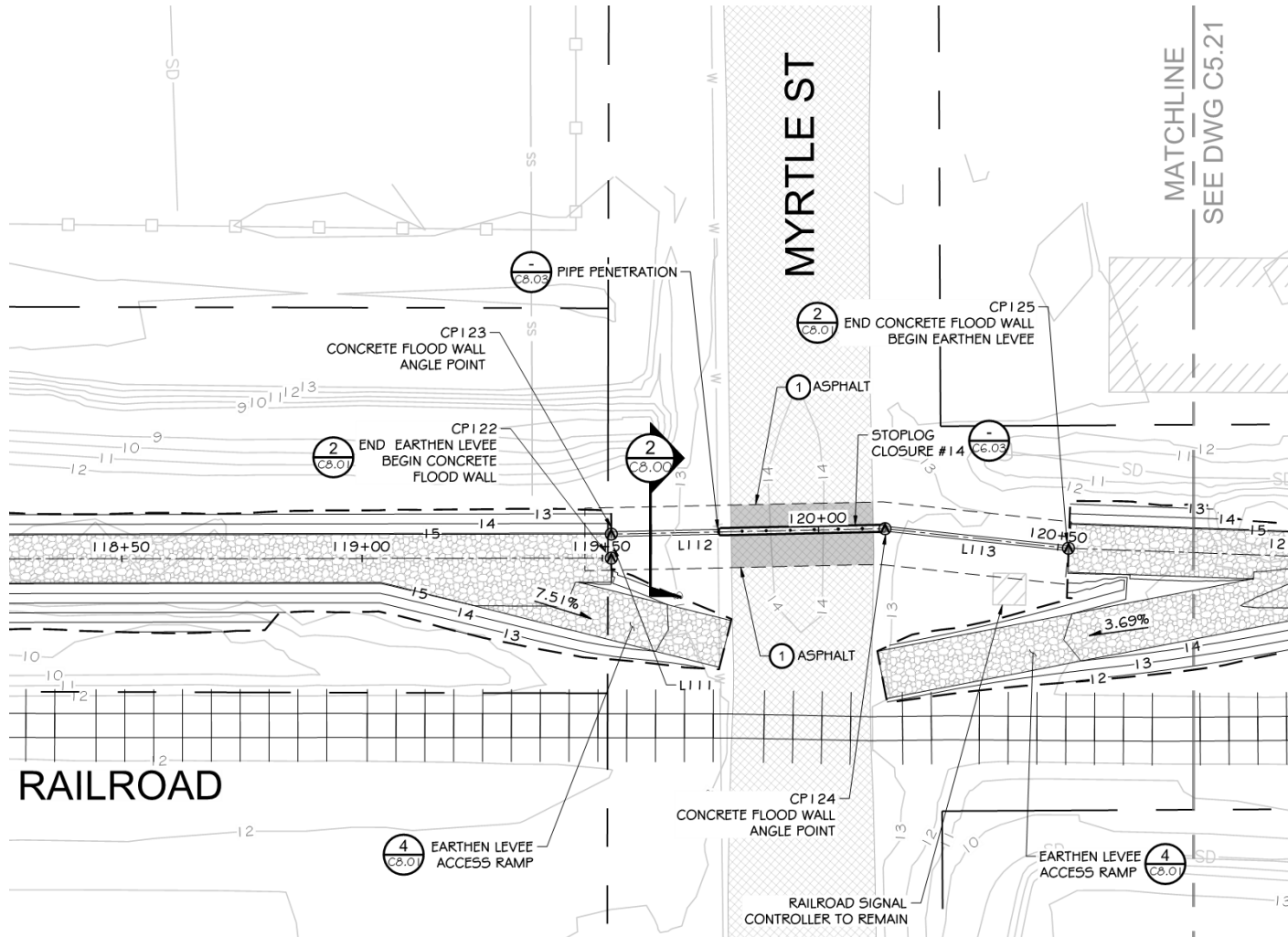
Work Completed

2. First Phase of Public Outreach, Government & Agency Coordination ✓




Work Completed

3. Develop Preliminary Design & Science Package, Submit to FEMA ✓



Work Completed

4. Receive Conditional Letter of Map Revision (CLOMR) ✓



Federal Emergency Management Agency
Washington, D.C. 20472

October 5, 2017

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Erik Larson
Mayor, City of Aberdeen
Aberdeen City Hall
200 East Market Street
Aberdeen, WA 98520


IN REPLY REFER TO:
Case No.: 17-10-1610R
Community Name: City of Aberdeen, WA
Community No.: 530058

Dear Mayor Larson:

We are providing our comments with the enclosed Conditional Letter of Map Revision (CLOMR) on a proposed project within your community that, if constructed as proposed, could revise the effective Flood Insurance Study report and Flood Insurance Rate Map for your community.

If you have any questions regarding the floodplain management regulations for your community, the National Flood Insurance Program (NFIP) in general, or technical questions regarding this CLOMR, please contact the Director, Mitigation Division of the Federal Emergency Management Agency (FEMA) Regional Office in Bothell, WA, at (425) 487-4682, or the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Sincerely,



Patrick "Rick" F. Sacibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

List of Enclosures:
Conditional Letter of Map Revision Comment Document

cc: The Honorable Jasmine Dickhoff
Mayor, City of Hoquiam

Mr. David Radabaugh, CFM
Washington Department of Ecology

Mr. Kris Koski, P.E.
City Engineer
City of Aberdeen

Mr. Mark Steepy, P.E.
KPFF Consulting Engineers

Mr. Brian Shay
City Administrator
City of Hoquiam

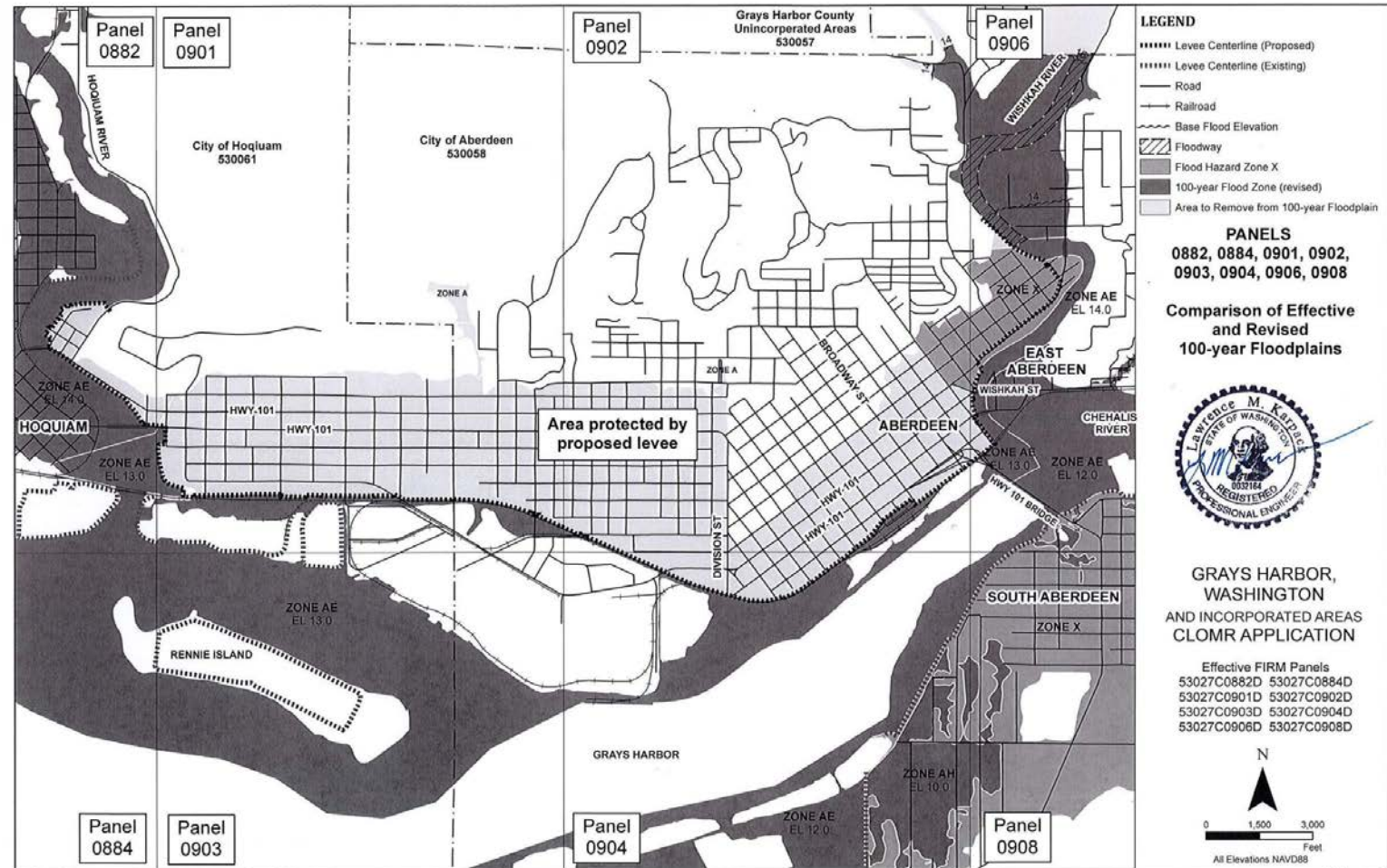


Figure 2

Remaining Tasks

5. Second Phase of Public Outreach, Government & Agency Coordination
6. Final Design, Permitting, & ROW Acquisition
7. Construction
8. Levee Certification & Letter of Map Revision (LOMR) → Protected Areas Change from SFHA to Zone X

Remaining Tasks

- *
 - 5. Second Phase of Public Outreach, Government & Agency Coordination
 - 6. Final Design, Permitting, & ROW Acquisition
 - 7. Construction
 - 8. Levee Certification & Letter of Map Revision (LOMR) → Protected Areas Change from SFHA to Zone X
- * *In progress, funded through Chehalis River Basin Flood Authority and State Supplemental Capital Budget (\$4.6 million).*

Remaining Tasks

- * 5. Second Phase of Public Outreach, Government & Agency Coordination
- 6. Final Design, Permitting, & ROW Acquisition
- 7. Construction
- ** 8. Levee Certification & Letter of Map Revision (LOMR) → Protected Areas Change from SFHA to Zone X
- * *In progress, funded through Chehalis River Basin Flood Authority and 2018 State Supplemental Capital Budget (\$4.6 million)*
- ** *2019-2021 Biennium State Capital Budget request*

Remaining Tasks – Funded and in progress. ✓

5. Second Phase of Public Outreach, Government & Agency Coordination
6. Final Design, Permitting, & ROW Acquisition



May 2018 field tour with USACE, WSDOE, WDFW



Engineers meeting with stormwater maintenance staff

Remaining Tasks – Not yet funded.

7. Construction

- Design and permitting anticipated to be complete by mid 2019.
- Construction will be ready to proceed once funded.
- 2019-2021 Biennium State Capital Budget request



8. Levee Accreditation & Letter of Map Revision (LOMR)

→ Protected Areas Changed from SFHA to Zone X

- Contingent on construction



Design Elevation 15.2 Feet NAVD 88

- Accounts for the 100-year and 500-year coastal flood events plus required freeboard per Federal guidance.
- Is 0.7 feet higher than the stillwater for the 1,000-year coastal flood event.
- Minimum elevation required by FEMA for 100-year flood protection and a Letter of Map Revision (per today's regulations) is 14.0 feet (including freeboard).
- Accounts for 1.2 feet of uncertainty (settlement, sea level rise, etc.) with respect to the current regulatory minimum elevation.

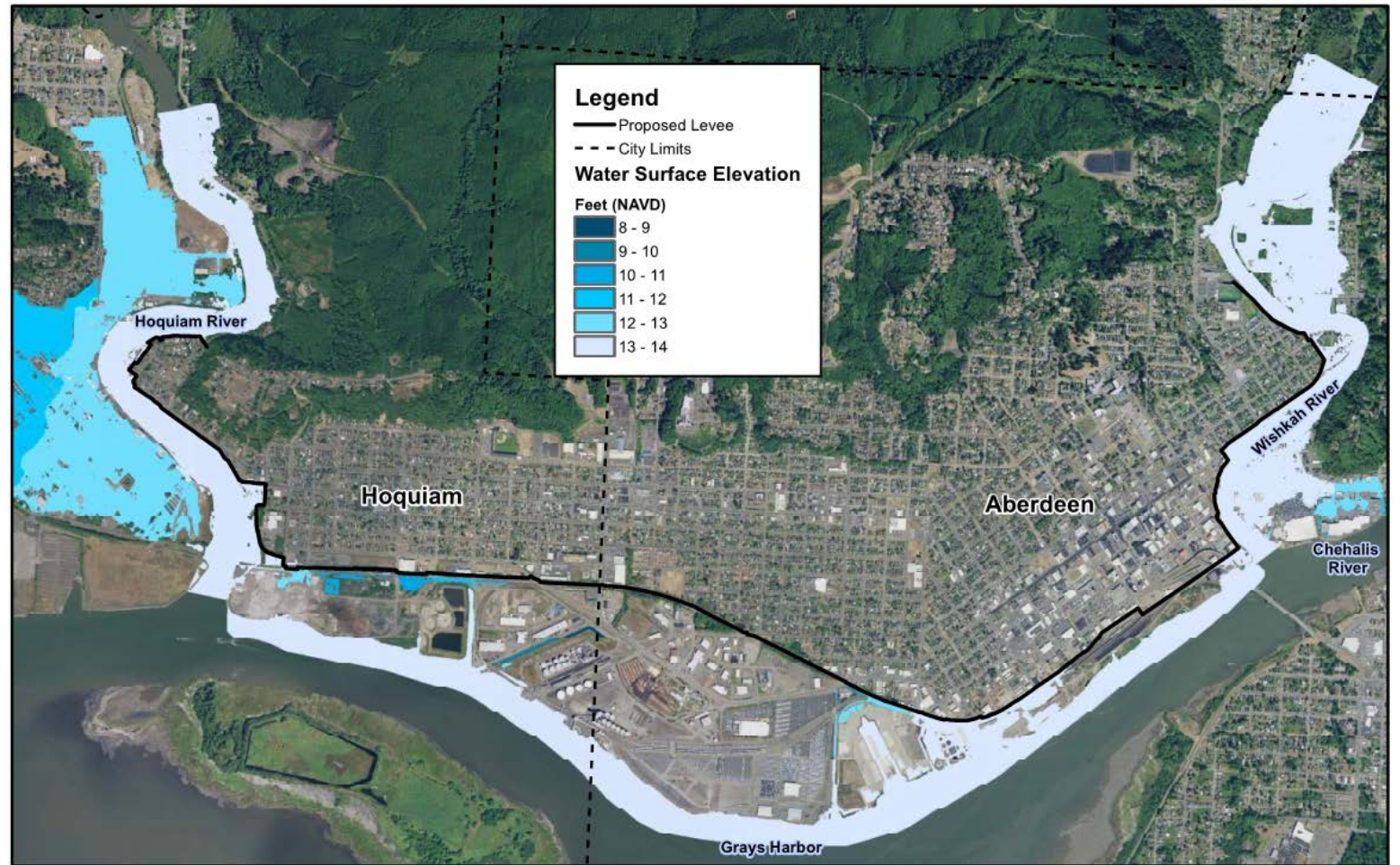
Design Elevation 15.2 Feet NAVD 88

- Challenges of designing higher:
 - Ability to integrate a levee into the built urban environment decreases as height increases.
 - Direct Costs → Higher water design means more footprint area and larger, deeper foundations.
 - **Earthen Levee Sections:**
 - Increase by 1-ft = \$100/LF → \$1.3 mil
 - Increase by 2-ft = \$225/LF → \$2.8 mil
 - Increase by 3-ft = \$400/LF → \$5.0 mil
 - **Concrete Wall Sections:**
 - Increase by 1-ft = \$150/LF → \$1.5 mil
 - Increase by 2-ft = \$300/LF → \$3.0 mil
 - Increase by 3-ft = \$500/LF → \$5.0 mil
 - **Sheet Pile Wall Sections:**
 - Increase by 1-ft = \$270/LF → \$2.0 mil
 - Increase by 2-ft = \$540/LF → \$4.1 mil
 - Increase by 3-ft = \$810/LF → \$6.1 mil



Thank You

Kris Koski, PE
City Engineer
City of Aberdeen
(360) 537-3218
kkoski@aberndeenwa.gov



www.ezview.wa.gov/aberndeenfloodrelief

