NATURAL HAZARDS MITIGATION PLAN

FOR THE

SPECIAL DISTRICT OF THE PORT OF BROOKINGS HARBOR (POBH)

MARCH 2018

The POBH is a vibrant port with about 530 slips (298 recreational and 232 commercial), ice production facilities, transient and trailerable vessel pumpouts, fueling, safety (US Coast Guard Station), launch ramps, boatyard maintenance, repair, lift, with full nearshore business and facility services

Plan Effective Date:
Date of FEMA Approval

POBH District
16340 Lower Harbor Rd,
Brookings, OR 97415

EXECUTIVE SUMMARY

The POBH Natural Hazards Mitigation Plan (NHMP) covers each of the natural hazards that pose significant threats to the District.

The mission statement of the POBH NHMP is to:

"Proactively facilitate and support district-wide policies, practices, programs, and actions that make the POBH more disaster resistant and resilient."

Making the POBH more disaster resistant and resilient means taking proactive steps and actions to protect life safety, reduce damage, and shorten the recovery period from future disasters.

Completely eliminating the risk of future disasters in the POBH is neither technologically possible nor economically feasible. However, substantially reducing the negative consequences of future disasters is achievable with the implementation of pragmatic mitigation measures that reduce the likelihood of damages to the harbor system in future disaster events.

An important benefit of the District having a FEMA-approved NHMP is that this makes the District eligible to apply for pre- or post-disaster FEMA hazard mitigation grants.

The 2018 POBH NHMP is a living document which will be reviewed and updated periodically.

Briefly, the NHMP includes a description of the hazards, probability, vulnerability, mitigation goals, priority actions, and implementation of this NHMP.

Comments, suggestions, corrections, and additions are encouraged from all interested parties.

Please send comments and suggestions to:

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1.0 DISTRICT PROFILE

The **POBH** is a port authority within Curry County, Oregon, United States, and serving the neighboring community of Harbor. The Port is governed by a five-member commission elected at-large from the service district population of approximately 16,000.

It is the busiest recreational port on the Oregon Coast, generating more than 31,000 boat trips for more than 95,000 people, and is one of the most active harbors for Chinook salmon on the coast. The Port District is defined, for the purposes of this NHMP, as the operations and facilities on Port property. They are shown in the Figures 1.1 (Key), 1.2 (Section A), 1.3 (Section B) and 1.4 (Section C).

FIGURE 1.1

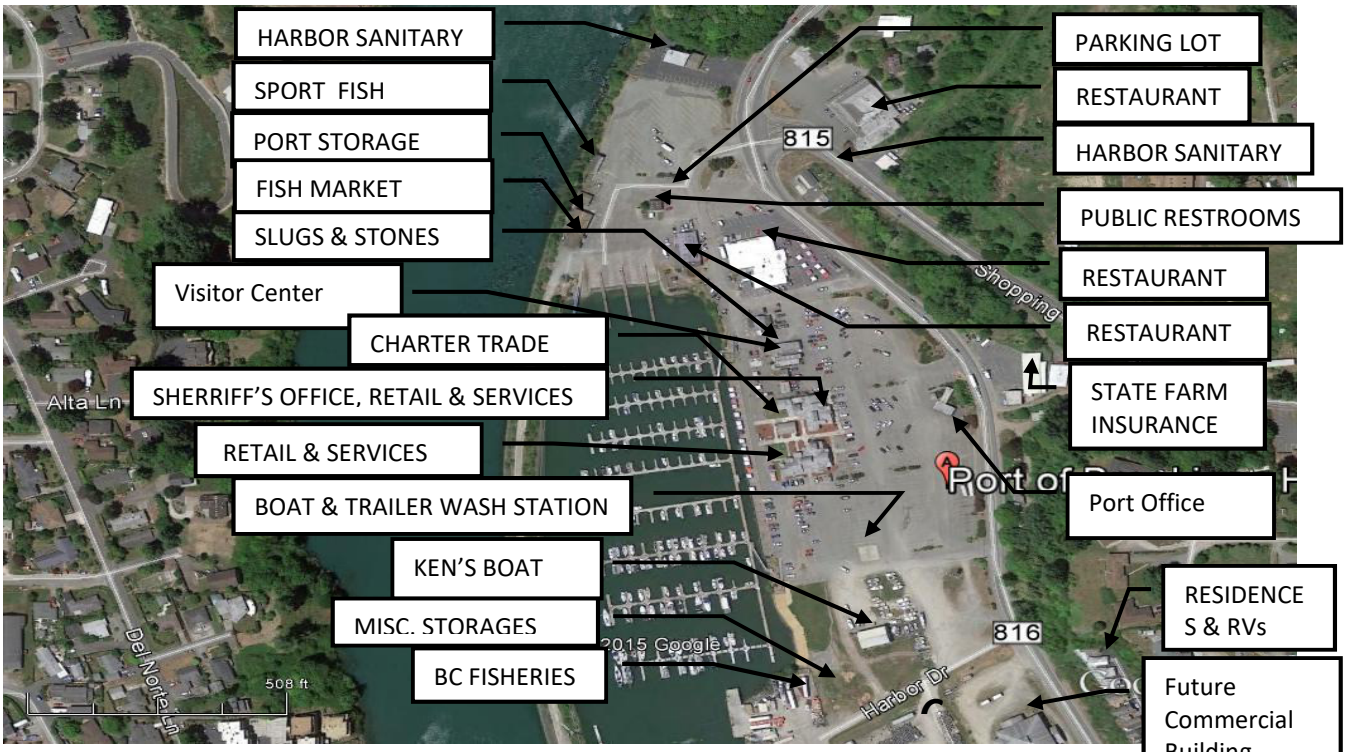


FIGURE 1.2

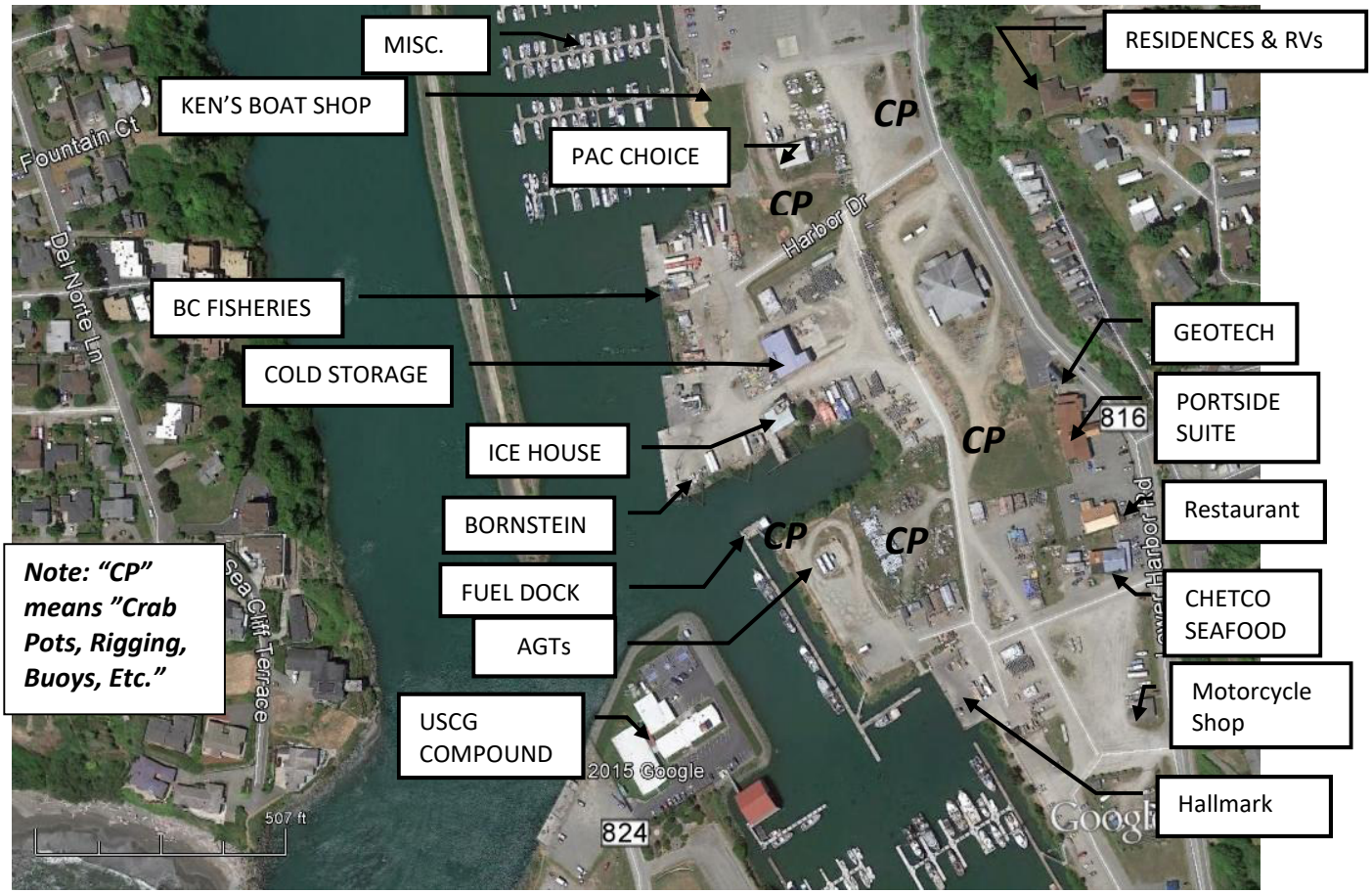


FIGURE 1.3

FIGURE 1.4

The Port owns approximately 60 acres of marine property at the mouth of the Chetco River in Curry County. The Port operates and maintains a Sport Basin (Basin 1) that accommodates approximately 298 recreational vessels, and a Commercial Basin (Basin 2) that accommodates approximately 250 vessels. In addition to the boat basins, Port facilities include receiving and fuel docks, icehouse and cold storage facilities, a boat yard, a boardwalk, an RV park, and numerous commercial buildings (see Figures 1.1-1.4 of Section 1.0 this NHMP). There are two rock jetties at the mouth of the Chetco River. The US Army Corps of Engineers constructed the rock jetties in 1957.

Modifications were completed in 1969 to extend the north jetty 450 feet and improve the entrance channel to 14 feet deep and 120 feet wide.

In 1970 an1800 foot long and 18 foot high protective dike was constructed along the south side of the Chetco River. A turning basin and small boat access channel were also completed in 1970. The turning basin is 650 feet long, 250 feet wide, and 14 feet deep. The Commercial Basin (Basin 2) access is 200 feet long, 100 feet wide and 12 feet deep.

As reported in Section 5.7 of the POBH 2015 Strategic Business Plan, entitled "Economics Benefits Analysis", a state wide study entitled the Economic Benefits of the Oregon Ports, March 2014 summarizes the permanent annual economic impact of the POBH, by including the following annual benefits:

- Totally Port related Oregon employment of 860 jobs (706 direct and 150 for indirect/induced);
- Oregon output (gross sales) were nearly $67.9 million ($40.9 million direct and $27. million in direct/induced);
- Oregon real Gross Domestic Product of $39.4 million ($22.65 million direct and $16.78 million in direct/induced);
- Oregon labor income of $23.93 million ($12.89 million direct and $11.05 million in direct/induced);
- Annual local and Oregon tax revenue/payments of $4.21 million ($1.26 million in local and $2.95 million in state tax revenues);
- Annual federal tax/payments by Oregon enterprises and employees of $5.12 million.

2.0 MITIGATION PLANNING PROCESS

The POBH 's Mitigation Planning process began in September, 2017.

The POBH 's NHMP has an in-depth focus on the District, its facilities and its people and includes more district-specific content, including district-specific hazard and risk assessments and mitigation priorities.

2.1 Mitigation Planning Team

The Mitigation Planning Team was led by: Gary Dehlinger, Port Manager. The Planning Team included the following members:

- Gary Dehlinger, Port Manager
- POBH Board of Commissioners
- Jack Akin, Engineer of Record

The Mitigation Planning Team's roles and responsibilities are defined as follows:

- Participate actively in Planning Team meetings.

- Provide local perspectives on natural hazards and the threats that they pose to the District's facilities and people.
- Help to identify existing Plans, studies, reports and technical information for inclusion or reference in the NHMP.
- Forge consensus on mitigation action items and their priorities.
- Help to facilitate the public outreach actions during the mitigation Planning process, and
- Review and provide comments on draft materials during development of the POBH NHMP.

2.2 Mitigation Planning Team Meetings

Mitigation Planning Team meetings are documented below with dates and summaries of each meeting. Meeting agendas are provided below in Section 2.3.

1st Meeting: October 26 Mitigation Planning Kick-Off Meeting

Present:

District Staff: POBH Board of Commissioners, POBH Port Manager

Consultant: Jack Akin, MS, PE

Others: Public Requested

Gary Dehlinger, with the Consultant's assistance, presented an overview of the Mitigation Planning process, FEMA's requirements and a preliminary assessment of the hazards posing threats to the District's facilities.

The meeting focused on three main topics:

- Identification of natural hazard, the Port's vulnerability and risk assessment, with assignments to Planning team members and the consulting team.
- Discussion of the District's outreach efforts and public meetings.
- Discussion of the project schedule.

2.3 Public Involvement in the Mitigation Planning Process

The District took robust efforts to involve the public and stakeholders throughout the mitigation Planning process, including the following actions:

The District announced the initiation of the NHMP Planning process via:

- Posting notices on the District's website (www.portofbrookingsharbor.com on October 18, 2017), and posting notices in the District's bulletin board (October 18, 2017),
- Publishing the notices in the following local newspaper website: Curry Coastal Pilot.

Public Meetings Agenda

Public meetings were announced via the modes listed above and held on the following dates;

- Meeting 1 on October 26th, 2017: Board and Public Meeting: Discussed NHMP construct, and conducted a workshop to identify natural hazards not listed in the preliminary NHMP submitted to all at the meeting.
- The Board Members also arranged to provide more detail to the Consultant (who was assigned the construction of the first full draft of the NHMP to be reviewed during Meeting 2) regarding mitigation and repair needs for the identified district. In addition to the consultant, Port Manager and the POBH Board of Commissioners, four persons from the public, all residents within the Port's service district, were present.
- Meeting 2 on November 3, 2017 (when the first full draft was completed and before it was presented to the Board for adoption).
- Meeting 3 on April 6th, 2018 (when the 2nd full draft was completed and presented to the POBH Board of Commissioners for adoption).

Review and Comment on the NHMP Drafts

Drafts of the POBH's NHMP were posted on the District's website for review on the following dates: November 11th – 16th.

All inputs received during the review and comment periods included the following:

Comment 1: An attending local resident expressed support for the Planning process outlined during the October 26 meeting.

2.4 Review & Incorporation of Existing Plans, Studies, Reports & Technical Information

The Strategic Business Plan (SBP) for the POBH, June, 2015, as *Attachment D-2*, to this NHMP.

After providing background that includes Port history, financial and market conditions, district demographics, situational analytical elements such as zoning, statewide planning goals, local and regional Plans and partners, and the identification of strengths, weaknesses, opportunities and threats, the SBP outlines hoped-for projects regarding fuels handling, fisheries docks, transient docks, commercial basin (Basin 2) docks, embankments (focusing on slope failure), parking lots, dredging needs, Sport Basin (Basin 1) boat launch, the old boardwalk, power and water utility availability.

Elements of the SBP are amalgamated into this NHMP. Data and calculations from a 2004 Wave Search Analysis, completed by West Consultants, Inc., Bellevue, Washington, prepared for the Portland District, Corps of Engineers, is also utilized for this NHMP.

Analyses provided within the 10– 30–16 Joint Permit Application (Attachment A-1), particularly under the title “Design and Data“, Section 6 (Project Description) are utilized for this NHMP.

Analyses provided by EMC – Engineers/Scientists, LLC (EMC) for the north boardwalk and the concrete landing above the fuel dock are also utilized for this NHMP.

3.0 HAZARD IDENTIFICATION, VULNERABILITY, AND RISK ASSESSMENT

For the Port District, the Oregon Natural Hazards Mitigation Plan identifies the following hazards as risks: Floods/Storm Surge (rain, wind, floods, winter storms), Tsunamis, Earthquakes, Wildland-Urban Interface Fires and Tornados.

3.1 Risk Assessment

The POBH NHMP addresses the following natural hazards in the order they pose the greatest risk

- Floods/Storm Surge (rain, wind, floods, winter storms)
- Tsunamis
- Earthquakes
- Wildland-Urban Interface Fires
- Tornados

Details about the hazards are found in above-referenced NHMP. The risk assessment from the State NHMP being referenced may also be found in Attachment D-1.

FLOODS/STORM SURGE

By far the most significant natural hazard, due to Port's vulnerability, and to the high frequency of this natural hazard in the Region (Region 1, defined within the attached Chapter 2 of the State Risk Assessment as including the coasts of Clatsop, Tillamook, Lincoln, Lane, Douglas, Coos, and Curry Counties), is Floods/Storm Surge.

Embankment failure has been greatly accelerated in recent years (2015 & 2016) by the 1) excessive loss of soil cohesion from surface and groundwater flow during storm season and 2) scour and undermining of embankment toes from storm-induced high wave energy.

Specifically, accelerated erosion, scouring, embankment failure and high wave energy, all resulting from, to the greatest degree and frequency, winter storms, and at a lower frequency, tsumamis and distant earthquakes, have been and are continuing to occur at the POBH as described below:

Sport Basin (Basin 1) - The Sport Basin accommodates approximately 298 recreational vessels.. Configuration of the floating docks includes a marginal walkway with 8 Main Way walkways (identified as A through H) and is a concrete construction supported by steel guide piles.

Walkways A through C have power available to the boats. In 2011, due to the 2011 tsunami, walkway A had to be rebuilt and so is in good condition. The overall observed condition of the remaining docks is poor and is deteriorating. As described within the attached (see *Attachment A-1*) Joint Permit Application, 92 piles are proposed to be replaced in the Sport Basin. As seen in the Section 6.0 of the Application, under the title of "**Design and Data**", this proposal satisfies minimum dock support requirements of impacted, failing dock systems.

However, an additional 90 piles, sized to 12"diameter, placed at locations supporting Docks B through H, would provide a higher safety factor, and strengthen the dock systems against tsunami threat.

It is assumed that the placement of these 90, 12" diameter piles, in addition to the 92 12" diameter presently being proposed via an HMGP grant request, would be done during a separate event. Therefore a separate equipment and supplies mobilization/demobilization would be required. The cost of this additional mitigation is estimated to be **$1,105,000**. This cost estimate is derived from the bid obtained for the proposed HMGP for 51 piles, as described in the budget table in *Attachment A-2*.

Boardwalk North Deck – A boardwalk north deck, constructed of timber with wood railing, is located upland of the Sport Basin (Basin 1) Docks. An H-pile steel/concrete panel retaining structure below the boardwalk is in deteriorating condition, as a number of joints in the concrete panels are failing. The north section of this boardwalk has received a preliminary engineering review that concludes that it is failing due to accelerated erosion (see Preliminary Engineering Report entitled "**MEMO-32517-01**", placed on EMC stationary, *Attachment B-1*). Photos of this north section are included in *Attachment B-1*. An estimate for the repair of this deck construction shown in MEMO-32517-01 was obtained by the POBH, totaling **$650,000**.

Sport Basin (Basin 1) Boat Launch – A six lane concrete ramp is located to the north of the recreational docks, utilized as a boat launch. Three boarding floats are located between the four launch ramps, of wood construction, secured with steel piles. Portions of the timber decking are broken and unencapsulated foam flotation is visible under some of the floats. The center float sits very low in the water at the transition point, which leads water onto the surface of the docks. The steel piles and plastic caps appear to be in satisfactory condition. However, several guide rollers are broken. The overall condition of the floating docks is poor, and their deterioration has been accelerated, first by wave energy from the tsunami, and secondly by noted storm events that hit the area during 2015 and 2016 winter seasons. The POBH is already engaged and has obtained funding to accomplish the repairs and replacements for the Sport Basin Boat Launch.

Transient Dock – The transient dock is located between the Commercial Basin (Basin 2) and Sport Basin (Basin 1), south of the barge slip. The floating dock is of concrete construction with timber wales and is supported by guide piles. The dock appear to be in fair condition, with some recent repairs evident where a vessel impacted the dock. Some of the pile hoops are in poor condition and some of the piles are not connected to the dock with hoops. It is also noted that some of the timber guide piles are significantly worn. The dock is accessed via an aluminum gangway from the asphalt parking lot above. Repair of this dock, including the replacement of six piles, is estimated to be **$326,400**, if completed as a stand-alone, which would include its own mobe/demobe costs. However, if combined with other needed dock system projects described in this NHMP, which is highly recommended, the added cost is estimated to be **$106,500**, reducing the cost by $219,900.

Commercial Basin (Basin 2) Docks – The Commercial Basin docks accommodate approximately 250 vessels. The floating dock system has 12 main walkways (identified as C through Q) that extend from four separate marginal walkways. The floating docks are of concrete construction with steel guide piles.

Docks H, I, J and O were replaced in 2012 because of damage from the tsunami of 2011. Though the supports for these docks were repaired and mitigated during the 2012 pile replacement project, about 48% of the battered docks were not, and thus the condition of these docks are undergoing accelerated deterioration. All of these docks provide electrical power. These docks are accessed via gangways from the west side of the basin. The docks that were installed in 2012 are in good condition, while the overall observed condition of the older docks is very poor. Replacement of the remaining and deteriorating docks is estimated to cost about **$1,450,000**. See annotated photos 9 – 12 in *Photo Appendix.*

Fuel Dock – The marine fuel dock is located at the north east end of the transient dock. This floating dock is of concrete construction supported by steel guide piles. The fuel dock includes an attendant station and the fueling station.
The fuel dock is accessed via a 60 foot steel gangway. The fuel is transferred from the storage facility through underground piping to the fuel dock. The overall observed condition of the dock is satisfactory, with minor levels of deterioration observed.

Upland Storage Area - The upland fuel storage facility is located in the parking lot above the transit dock and includes two 12,000 gallon, double walled tanks on a concrete pad. Each tank is mounted to the concrete pad and protected by bollards. Each fuel tank is split into 6000 gallon sections. One tank contains premium unleaded fuel and the other tank contains diesel fuel. The fuel tanks appeared to be in good condition. An oil boom is stored adjacent to the tanks.

The upland area generally consists of dirt and gravel and is in poor to fair condition. There is poor service drainage and potholes on the site. Slopes along the west and north sides of this upland area are failing, and a concrete pad approach from which the aluminum gangway access to the fueling dock is mounted, is slipping (see *Attachment C-2*, **MEMO-11917-01** for preliminary study and recommendations regarding this concrete landing approach). Since fuel, electrical and water lines are mounted to the gangway, beneath and attached to this concrete pad, the slope failures, are attributed by the above-mentioned preliminary engineering study to be caused by loss of soil cohesion due to excessive flooding, is a serious safety and environmental hazard. The underlying riprap repair recommended is a gradation equivalent to ODOT 2000, with an average weight of about 750 pounds, and the largest rocks weighing about 2000 pounds. The pad must be laid with a peripheral keying atop graded aggregate, and thence atop an average of 4.5 feet of compacted fill. The fill would be supported by native soils and existing riprap. Five H-beams should be driven into the underlying native soils and the pad is fixed to the beams. These beams are specified to have cross-sectional areas of 15.6 $in.^2$, 12” deep and have a flange width of 10”.
They are of 36,000 $lbs./in.^2$ (36 ksi) steel, to provide adequate lateral strength (Mx = 10 kips, My = 5 kips) for this structure. The beams should be driven at least 16 feet into the native soils, or to a point of fixity.

All piping (for electrical, sewer, water, telecommunications, fuel service) should be inserted through pre-installed chases that would be located in the compacted fill beneath the pad and underlying aggregate base.

Since the entire base of this structure is unstable, the entire structure must be removed, base fill and rock placed correctly, H-piles driven, and a new concrete platform constructed, replacement cost for this structure and underlying rip-rap and base rock is about **$480,000**.

General Stormwater Drainage – Particularly during storm season, there are widespread drainage issues on POBH asphalt, concrete and graveled surfaces. Pooling and misdirected surface waters accelerate asphalt parking lot subgrade degradation, potholes develop in graveled areas and concrete cracking under unsupported loads are occurring. Protection against long-term (> 5 years) deterioration of surfaces at POBH can be relatively easily provided by the proper grading, resurfacing and stormwater conveyance at areas approaching the Ice House/Cold Storage Areas (84000 $ft.^2$), upland storage area around the aboveground fuels storage area (69,000 $ft.^2$), Sport Haven area (3000 $ft.^2$), the approach to the Boat Yard area, and at the beginning at the southeast corner of the Commercial Basin (Basin 2) (7500 $ft.^2$) and RV Park (102,000 $ft.^2$). There is minimal sub-base rock requirement at these locations, and EMC preliminarily has found that minimal grading, sub-base rock, 3" – 6" of leveling course beneath 3" asphaltic concrete, catch basins and stormwater conveyance, concrete curbing on west borders of described areas would cost about **$1,562,000**.

Embankments – Significant failure has been noted at most locations around the Commercial Basin (Basin 2), the Icehouse Inlet, and along the east side of the Sport Basin (Basin 1). About 950 feet of embankment along the west side of the Commercial Basin (Basin 2), and approximately 500 feet of embankment along the east side of the Commercial Basin (Basin 2), 280 feet of embankment along the east side, between the north side of the Commercial Basin (Basin 2) up to the southwest corner of the Icehouse Inlet (near the location of the fuel dock), 225 feet along the south embankment of the Ice House Inlet, and 350 feet along the north embankment of the Icehouse Inlet are all failing due to accelerated erosion.

These embankments will continue to degrade, and, now that failure has begun at the above-cited locations, deterioration of these slopes and the structures they support, will accelerate. Increased erosion will push more sediment into the Port basins, and access to many services, will become more limited. As of the date of this first NHMP submission (November 3rd, 2017), over 450 linear feet of sidewalk along the west side of the Commercial Basin (Basin 2) is restricted from public access.

It is recommended that these embankments be more permanently repaired. The repair should be such that these slopes are protected from energetic storm surges and high surface/groundwater flows from adjacent parking lots and hillsides that occur at the Port during winter storms. Several slope stabilization methods are available, including

1) retaining walls constructed with sheet pile, pile and plank, H-pile/concrete sections, with tie backs and/or helical screws; 2) cantilevered retaining walls as described in 1), but without tie backs or other support; 3) rock wall placed at a 1.5/1.0 slope (maximum). Of these options, the cost associated with parking lot repairs from tie-back excavation out-weighs that of heavier materials required for cantilevering. Rock wall construction at 1.5/1.0 slope would take valuable moorage space at the toe of the wall, particularly along the north and south Ice House Inlet and west Commercial Basin (Basin 2) embankments.

EMC has therefore recommended and preliminarily specified an embankment repair constructed of stand-alone (cantilevered) H-pile/concrete section.

In order to support a cantilevered loading, prefabricated concrete sections that are 12 feet tall, having about a 10 ft.^{2} cross-section (approximately 11 1/2" x 10') weighing approximately 17,130 pounds each, reinforced with #5 rebar, 10 equally spaced vertically, 12 equally spaced horizontally, double curtained, all cast 3 inches clear of all edges and faces. These concrete sections should be supported by 14 inch wide flange (W 14 x 90) piles. Concrete is to be minimum 4000 psi at 28 days. Rebar picking eyes (two each), when set, will bend hook 90° into precast pocket and filled flush with high strength grout. Piles will be driven to point of fixity (to be determined at each location).

Fabric that will allow for drainage while retaining fine-grained sands and silts will be placed between the wall and engineered backfill.

An estimate for the construction of the wall, placement of fabric and fill is $175 per square foot. It is estimated that about 27,660 ft.^{2} (2305 linear feet x 12" high) of wall of this construction should be placed along these above-described embankment.

The estimated budget for this work is **$4,840,500**.

505 feet of embankment, additional to that described above as Boardwalk North Deck, presently supported by an H pile/concrete section retaining wall construction along the east side of the Sport Basin (Basin 1) supports the soils that are at the base of the north boardwalk, extending from the newly constructed south (160 foot long) concrete boardwalk, all the way to the north gangway access to the Sport Basin (Basin 1).

Unlike the other embankment repairs already described above, repair of this 550-foot section requires the removal and new construction of structure (the boardwalk itself), as well as considerable excavation to ease the slope, replacing the entire shoring with concrete and handrailing. Considerations for this construction focus primarily on public safety.

This Boardwalk section serves most of the leasing businesses at the port, and serves a high density of tourism and residential foot traffic. The cost of this boardwalk and wall replacement is estimated to cost about $7623/lineal foot, or **$3,850,000**.

Commercial Receiving Docks – There are five sections of commercial receiving dock located on the east side of the marina between the Sport and (Basin 2) Basins.

1) North-most is that which has been called the Old BC Fisheries Dock, which is failing, which requires 160 feet of repair along its west side and about 50 feet of repair along its north side.
2) The adjoining receiving dock is the newly constructed BC fisheries bulkhead of about 100 feet in width.
3) South and adjacent to the BC Fisheries dock is that of the Bandon Pacific operations, a dock of a length of about 95 feet.
4) South and adjacent to Bandon Pacific is a high dock, constructed of sheet pile, repaired in 2012.
5) South and east of the previously described embankment that extends from the fuel dock southward the full length of the main transient dock is a 145 foot length of embankment beneath and supporting Hallmark Fisheries receiving dock operations.

Of these five commercial receiving docks described, the Old BC Fisheries dock, the Bandon Pacific dock and the Hallmark Fisheries Dock are failing and have been presently limited by the Port regarding their loading capacity. See annotated photos 5 – 8 in *Photo Appendix.*

Increased wave energy from higher than normal tides and surges from 2015 and 2016 storm events have accelerated scouring and subsequent supporting embankment sloughing at these locations. To more permanently mitigate these ongoing conditions a cantilevered dock design is recommended.

For this type of approach a W 24×76 I-beam structure extended 20 feet beyond (seaward) the supporting seawall, With supporting struts of HP 10 x 42, with the stretch bass resting a top concrete footing and extending so that the top end of the strut supports the cantilevered I beam 9 feet seaward from the supporting seawall. The top of the working deck would be 7 inches of reinforced concrete over a steel pan deck. A cross-section is provided in *Attachment C-1*. Note that this is a preliminary design. The cost for this type of construction, including site preparation, is estimated at $9900 per linear foot. In total, the replacement for these three receiving docks is estimated to be **$4,455,000**.

Protection Against Flooding and Debris at RV Park-Winter storms and corresponding high water and wave energy frequently (every few years) carries debris and produces flood damage at the RV Park (see *Attachment E-1*). In 2016 damage repairs were estimated at about $750,000. The rock used for this project will be specified to follow test requirements found within AASHTO 85 (Apparent specific gravity, percent absorption); ODOT TM 208A (degradation);and ASHTO T 104 (soundness). All rock specified in this project must be angular in shape, and the thickness of any single rock shall not be less than one third of its length. Round rock will not be accepted unless authorized by EMC.

The rock must meet the gradation requirements for the class specified, be free from overburden, spoiled, shale and organic material. Non-durable rock, shale or rock with shale seams is not acceptable. Class 2000 rip rap is by definition comprised of rocks that are 20% by weight of 1400 pounds to 2000 pounds, 30% by weight of 700 to 1400 pounds, 40% by weight 40 to 700 pounds and 0 to 10% 0 to 40 pounds.

A clamshell, orange peel bucket, skip or similar approved device will be used which will contain the riprap material to its final destination.

The longitudinal extent of this repair should be continuous for a distance greater than the length that is impacted. The vertical extent of protection required for this revetment includes design height and foundation or toe depth. The design height of the rip rap installation is to be equal to the design high water elevation (King tide plus storm surge) with adequate freeboard to accommodate wave action, super elevation from the channel bend, hydraulic jump, and flow irregularities, plus erratic phenomena such as unforeseen embankment settlement, accumulation of trash and debris from the river. A median buildup added elevation is determined to be four feet above existing.

The estimated linear repair is estimated to be 1500', and rock volume of about 800 cubic yards (about 1730 tons). The cost for the delivery from the closest quarry able to fulfill the above-listed specifications, the rock itself, and placement is estimated to be **$340,000.**

TSUNAMIS

A large tsunami (and associated earthquake) would likely destroy many buildings in coastal communities that are located in the tsunami inundation zone. The damage would be from the combined effects of the forces from the tsunami surges, currents and debris, as well as the earthquake hazards. The State of Oregon has adopted construction standards for buildings in tsunami zones (**2015 ORS 455)**. The National Tsunami Hazard Mitigation Program recently completed the document entitled ***Designing for Tsunamis*** that outlines some of these issues.

Tsunami's – most recently, in March, 2011, the POBH was damaged by tsunami wave energy, as a result of a 9.0 magnitude underwater earthquake off the coast of Japan. Close to $8 million worth of repairs were necessary, which included some mitigation, as a result of this disaster.

Date/ Location/ Description; Remarks

Jan. 1700/ offshore/ the Cascadia Subduction Zone Approximately 9.0; generated a tsunami that struck Oregon, Washington, and Japan; destroyed Native American villages along the coast.

Mar. 2011/ offshore/ DR-1964 was Oregon's first tsunami Major Disaster Declaration (far-field event originating from a massive subsea earthquake near Japan).

Effects from the trans-ocean tsunami in Oregon were largely confined to rapid changes in sea levels at port facilities in Curry and Lincoln Counties. Previously developed tsunami evacuation planning and inundation mapping were used as a life/safety measure (no lives were lost to the tsunami wave activity) based on the Pacific-wide tsunami warning.

The tsunami wave impacts, although much less than those from a near-field Cascadia event, provided further impetus for the City of Newport to consider and seek mitigation funding for a tsunami "safe haven" project that will retrofit an existing land feature as a "high ground" evacuation site.

The POBH implemented a post-disaster, multi-hazard mitigation project to protect their port facility from far-field tsunami waves and for storm surge waves that can occur during any winter season.

The mitigation efforts described in the section of this report entitled "**Floods/Storm Surge**" also largely provide protection against the effects associated with earthquakes and tsunamis (damage to dock systems, embankments and shoreline structures).

EARTHQUAKES

The geographical position of Region 1 (defined within the attached Chapter 2 of the State Risk Assessment as including the coasts of Clatsop, Tillamook, Lincoln, Lane, Douglas, Coos, and Curry Counties) makes it susceptible to earthquakes from three sources: 1) the off-shore Cascadia Fault Zone, 2) deep intra-plate events within the subducting Juan de Fuca plate, and 3) shallow crustal events within the North America Plate. All have some tie to the subducting or diving of the dense, oceanic Juan de Fuca Plate under the lighter, continental North America Plate. Stresses occur because of this movement.

There is no historic record of major damaging crustal earthquakes centered in this region in the past 156 years, although Region 1 has experienced small crustal earthquakes and crustal earthquakes that originated outside the region. The geologic record shows that movement has occurred along numerous offshore faults as well as a few onshore faults in Coos and Tillamook Counties.
The faulting has occurred over the last 20,000 years. Intraplate earthquakes are very rare in Oregon, although such earthquakes originating outside of the state have been felt in this region.

It is believed that the M7.3 near Brookings in 1873 was an intraplate quake. In Region 1, geologic earthquake hazards include severe ground shaking, liquefaction of finegrained soils, landslides and flooding from local and distant tsunamis.

The severity of these effects depend on several factors, including the distance from the earthquake source, the ability of soil and rock to conduct seismic energy composition of materials, and the ground and ground water conditions.

Historic Earthquake Events

Approximate years, cited from the Oregon State Plan, of historic earthquakes are 1400 BC, 1050 BC, 600 BC, 400 AD, 750 AD, 900 AD. These are generally offshore, Cascadia Subduction Zone, estimated at M8-9.

Date/ Location/ Description; Remarks

Jan. 1700/ offshore/ the Cascadia Subduction Zone Approximately M9.0 generated a tsunami that struck Oregon, Washington, and Japan; destroyed Native American villages along the coast
Nov. 1873/ Brookings area/ a M7.3 intraplate event, origin probably Gorda block of the Juan de Fuca plate; chimneys fell (Port Orford, Grants Pass, and Jacksonville), no aftershocks
Nov. 1962/ Portland, OR/ M5.2 to 5.5 crustal event; damage to many homes (chimneys, windows, etc.)
Mar. 1993/ Scotts Mills, OR/ M5.6 crustal event; FEMA-985-DR-OR, damage- $28 million (homes, schools, businesses, state buildings in Salem)
Sep. 1993/ Klamath Falls, OR/ M5.9 to 6.0 crustal event, FEMA-1004-DR-OR, two earthquakes; fatalities: 2; damage $7.5 million (homes, commercial, and government buildings)

Discussion Regarding Risk and Mitigation-Tsunamis and Earthquakes

Risk and mitigation for tsunamis and for earthquakes are common in terms of potential damage and prevention actions, and so are combined in the narrative below.

FEMA's (2011) review of historical tsunamis affecting the Oregon coast for FEMA-1964-DR-OR documents 7 tsunami events from 1700 through 2011. This report suggests a mean interval time of about 50 years and recommends this as the "event frequency." The historical data in this report are very useful, although the surge height and damage data are incomplete. However, the frequency analysis has two significant flaws:

1) the 7 tsunami events include 6 distant earthquake events along with the 1700 Cascadia Subduction Zone event and
2) historical data for distant tsunamis are probably incomplete before the 1940s and certainly incomplete before 1873, the earliest distant earthquake tsunami event listed.[2]

These historical data are reinterpreted as follows. The six distant earthquake events fall into two groups

Major events with significant damages

- 1873, surge height 10 feet
- 1964, surge height 4.6 to 12 feet at various locations
- 2011, surge height 6.6 feet at Brookings Harbor

Lessor events with minor damages

- 1946, surge height 4 feet at one location only (Seaside)
- 1952, no surge height data
- 1960, no surge height data

The three major distant earthquake tsunami events were recorded over 138 years, which corresponds to a return period of 46 years. These events are included in the benefit-cost analysis presented later in this report

The three smaller events with very limited surge height data and minor damages are probably similar to the more frequent storm surge events.
In the spirit of a conservative, lower-bound type benefit-cost analysis, these events are not considered in the benefit-cost analysis.

Cascadia Subduction Zone Tsunamis

The 2011 report by Goldfinger et al. documents the paleoseismic history of the Cascadia Subduction Zone over the past 10,000 years using dates for turbidite deposits offshore. Time-correlated turbidite deposits at many locations along the length of the Cascadia Subduction Zone from Northern California to British Columbia yield the following numbers of major mega-thrust earthquakes:

- 19 M9.0 earthquakes (full length ruptures) and
- 21 Additional M8+ events (rupture of the southern 50% to 70% of the Subduction zone).

These paleoseismic results indicate return periods of about 500 years for the M9.0 events and about 250 years for M8 or greater events (including the M9 events).

Tsunami surge events from these major Cascadia Subduction Zone earthquakes would likely have surge heights of 30 to 105feet (FEMA 2011, DOGAMI Modeling, 2012) and result in complete or nearly complete destruction of harbor facilities all along the Oregon Coast, including Brookings Harbor.

There are no mitigation measures to protect harbor facilities from events of this extreme magnitude that are feasible from either an engineering or economic perspective. Therefore, the proposed mitigation project is designed to minimize damage in smaller distant earthquake tsunami events and in the frequent storm surge events. As afore-mentioned, the mitigation efforts described in the section of this report entitled "**Floods/Storm Surge**" also largely provide protection against the effects associated with earthquakes (damage to dock systems, embankments and shoreline structures).

WILDFIRES

Most counties within Region 1 have low to moderate risk from wildfire based primarily on cool, moist weather conditions. However, this region has had some of the largest wildfires that posed threats to communities when they occurred. The 1936 Bandon Fire is a prime example of a fire that, when combined with heavy fuels (gorse) and powerful dry east winds, an entire city was destroyed killing 13 people.

Gorse, brush and timber still make up much of the landscape in Region 1. Given the right conditions, this region's vulnerability to wildfire exists. However, due to infrequent fire activity, the level of vulnerability can be categorized as moderate. A large wildfire in this region would affect local economies that rely on tourism and recreation dollars.

The economic stability of the region is dependent on a major state highway (Hwy 101) that runs along the Oregon Coast. Should a major wildfire or other natural event (such as a tsunami) threaten or impact this major thoroughfare, coastal tourism and recreational economies would come to a halt.

In addition, each year a significant number of people build homes within or on the edge of the forest (urban-wildland interface), thereby increasing wildfire hazards. Risk of direct hazard from wildfires at the POBH is limited by available fuels. The POBH and its facilities are somewhat isolated from the fields and forested areas surrounding the Port. Nevertheless of direct fire damage, risk, though minimal, does exist.

The far greater risk to the POBH from wildfires is from accelerated erosion and sedimentation. The Chetco Bar fire, which is located in the Kalmiopsis Wilderness and Chetco River corridor near Brookings, grew to approximately 200,000 acres.

Wildfire affects streams and rivers in a multitude of ways, and the health and wealth of a stream environment are reflections of the condition of the surrounding watershed. Stream ecosystems are constantly changing and are often altered by episodic floods and droughts. Erosion is a natural process. Its effects on a stream are highly variable. Add a high-intensity wildfire, and conditions in the stream or river at the bottom of the hill can change rapidly. All of these naturally occurring events are described as pulse disturbances – with effects that are initially severe but generally short-lived. Over time, the stream environment recovers or shifts to a new and different equilibrium.

Much of that sediment loss can occur the first few years after a wildfire, though in some cases, sediment accumulations may take decades or even longer to recover to pre-fire conditions. Wildfire can cause water repellency and consume plant canopy, surface plants and litter, and structure-enhancing organics within soil. Changes in soil moisture, structure, and infiltration can accelerate surface runoff, erosion, sediment transport, and deposition. Intense rainfall and some soil and terrain conditions can contribute to overland runoff and in-channel debris torrents.

Mineralization of organic matter, interruption of root uptake, and loss of shade can further impact water quality by increasing stream temperatures and nutrient concentrations. Where wildfires are unnaturally large and severe, watershed effects are likely to be negatively skewed.

The area of this 2017 burn covers the Quail Prairie Mountain, the Kalmiopsis , a portion of Eagle Mountain, Rosley Butte, Mineral Hill, Snow Camp Mountain, Big Craggy's, Heather Mountain, Basin Butte, and other watersheds. A good number of creeks and tributaries, most of which directly or indirectly contribute to stormwater collection with the POBH as its destination, are fed by these watersheds.

As mentioned above, due to the infrequency of fire activity in the Chetco corridor and other above-described areas, the level of vulnerability can be categorized as moderate. Also, as aforementioned, the risk of direct hazard from wildfires is limited by available fuels. The afore-described increase of sedimentation in the area of this most recent fire event is expected to directly impact shoaling rates at the POBH over the next two to five years.

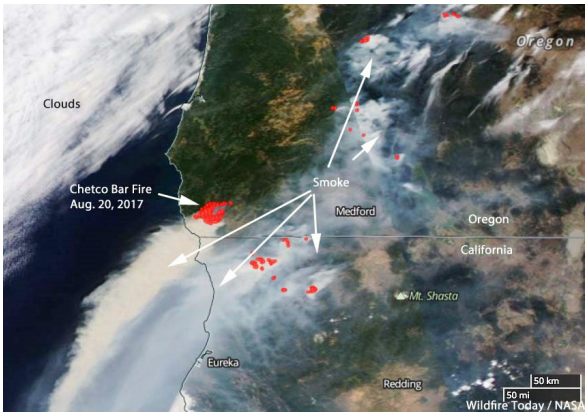
In anticipation of the possible 225,000 cubic yards of sediment that could be accumulated in total at the POPH during that time period, the POBH has conducted a recent (2017) bathymetric survey of all basins.

Based on previous bids for mitigating accumulated sediment appeal pobh in the past ($35/cy), the cost for the Permitting, design, characterization, dredging and disposal Is estimated to be **$7,500,000**.

Recent Wildfires that Threatening Sedimentation to the Port of Brookings Harbor

Below are descriptions of recent, significant wildfires that have occurred within or near river, creek or stream watersheds that have and/or will threaten to increase sedimentation, directly impacting shoaling rates at the POBH.

The Chetco Fire



The Chetco Bar Fire was started by a lightning strike in the Kalmiopsis Wilderness near the Chetco River. It was reported on July 12, 2017 at 1:45 PM. By July 15, it was primarily burning in the scar of the 2002 Biscuit Fire (see below) and had only burned 45 acres. By July 20, it was determined that the fire had actually burned over 300 acres (1 km2). As of August 2, the fire had expanded to 2,907 acres (12 km2).

By August 19, the fire had spread 22,042 acres (89 km2) and the first mandatory evacuations were put in place - for the top of Gardiner Ridge Road and Cate Road past Hazel Camp area, Wilson Creek area, and along the Chetco River from Loeb State Park to the wilderness retreat area. By August 24 the fire had burned 102,333 acres (414 km2), burning in steep and rugged terrain about five miles north of Brookings, Oregon. The smoke from the fire began impacting visibility along Highway 101 and creating dramatic hazes in Gold Beach and in Brookings. By August 30, the National Guard had joined the fire-fighting efforts. As of September 10, the fire was at 182,284 acres (738 km2) and was 5% contained. The fire had spread into Curry County. In Josephine County, crews began structure assessments of the communities of O'Brien, Cave Junction, and Selma. The fire was announced as being 100% contained on November 2nd.

The Biscuit Fire

Between July 12 and July 15, a series of lightning storms occurred in California and Oregon starting hundreds of small wildfires. During this period, five such fires were started within a 20-mile (32 km) radius of each other near the state border. Due to the fires already burning in other areas, insufficient numbers of fire crews and smokejumpers were available to combat these fires and they began to burn out of control.

The large Florence Fire, which had started approximately 30 miles (48 km) north of the border, eventually joined what was known as the Sour Biscuit Fire, which was burning very close to the border. Once the massive Biscuit Fire was created, it could not be fully contained until December 31, 2002. The fire destroyed 4 primary residences and 10 other structures, put 15,000 residents on evacuation notice and burned most of the 180,000-acre (730 km^2) Kalmiopsis Wilderness. Despite the level of destruction, there were no deaths attributed to the fire.

TORNADOS

Date/ Location/ Description; Remarks

June 1897/ Bay City, Oregon/ observed; no damage recorded
Oct. 1934/ Clatskanie, Oregon/ observed; no damage
Apr. 1960/ Coquille, Oregon/ accompanied by heavy rain; no damage
Nov. 1965/ Rainier, Oregon/ crossed Columbia River; two buildings damaged
Oct. 1966/ Seaside, Oregon windows broken, telephone lines down, outdoor signs destroyed

Oct, 1967/ Near Astoria, Oregon airport/ began over ocean and moved inland; several homes and commercial buildings damaged
Dec, 1973/ Newport, Oregon/ some roof damage
Dec. 1975/ Tillamook, Oregon/ 90 mph wind speed; damage to several buildings
Aug. 1978/ Scappoose, Oregon/ manufactured home destroyed; other damage
Mar. 1983/ Brookings, Oregon/ minor damage
Nov. 1984/ Waldport, Oregon/ damage to automobiles and roofs
Feb. 1994/ Near Warrenton, Oregon/ damage in local park
Nov. 2002/ Curry County, Oregon/ $500,000.00 in property damage
Nov. 2009/ Lincoln County, Oregon/ $35,000 in property damage, damage to homes and automobiles

Sources: National Weather Service, Portland-Taylor and Hatton (1999);
National Climatic Data Center (2013) Storm Events Database
http://www.ncdc.noaa.gov/stormevents;
Hazards & Vulnerability Research Institute (2007);
The Spatial Hazard Events and Losses Database for the United States, Version 5.1 [Online Database], Columbia, SC;
University of South Carolina-Available from http://www.sheldus.org;
National Climatic Data Center (2013), US Tornado Climatology,
http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html

As aforementioned, the mitigation efforts described in the section of this report entitled "**Floods/Storm Surge**" also largely provide protection against the effects associated with tornados (damage to dock systems, embankments and shoreline structures).

3.2 Land Uses and Future Development Trends

The land uses within the POBH 's service areas varies from commercial, industrial and public use. The rate of new development has been low in recent years and has been mostly industrial.

The District necessarily extends its distribution system to areas of new development. For such extensions, the District conforms to current seismic design requirements.

Therefore, the risk from seismic hazards is much lower than for older parts of the system designed to lower seismic standards or for system elements nearing the end of their useful lifetime. Similarly, for new construction, the District follows prevailing codes and standards.

4.0 MISSION STATEMENT, GOALS, OBJECTIVES AND ACTION ITEMS

4.1 Mission Statement

The mission statement of the POBH 's NHMP is:

Proactively facilitate and support district-wide policies, practices, programs, and actions that make the POBH more disaster resistant and disaster resilient.

4.2 Mitigation Goals

The POBH 's mitigation goals are:

Goal 1: Reduce Threats to Life Safety,

Goal 2: Reduce Damage to District Facilities and the Environment, and

Goal 3: Reduce the Frequency and Duration of Outages.

4.3 Mitigation Action Items

4.3.1 Prioritization of Mitigation Actions

The POBH prioritization of mitigation actions included the following factors:

1. The mission statement of the NHMP:

   Proactively facilitate and support district-wide policies, practices, programs, and actions that make the POBH more disaster resistant and resilient.

2. The POBH 's mitigation goals:

   Goal 1: Reduce Threats to Life Safety,

   Goal 2: Reduce Damage to District Facilities and the Environment, and

   Goal 3: Reduce the Frequency and Duration of Outages.

3. Benefit-cost analysis to ensure that mitigation projects are cost effective, with benefit exceeding the costs.

4. The STAPLEE process to ensure that mitigation action items under consideration for implementation meet the needs and objectives of the District, its communities, and citizens, by considering the social, technical, administrative, political, economic and environmental aspects of potential projects.

5. The District does not have the resources (capability) to implement the action within the duration of this NHMP.

Table 1
POBH 's Mitigation Action Items

Rank	ACTIONS	Timeline	Source of Funds	Lead Agency	Support Agency	Life Safety	Damage Reduction
1	Evaluate and prioritize mitigation measures for the above hazards (see PP 11 – 17), as funding becomes available.	Ongoing	POBH	POBH (Port Mgr., Harbor-Master)	POBH Engineer-of-Record	X	X
1	Ensure that new infrastructure components are adequately designed to minimize risk from natural hazards.	Ongoing	POBH	POBH (Port Mgr., Harbor-Master)	POBH Engineer-of-Record	X	X
1	Evaluate the seismic vulnerabilities of embankments and overstructures, and prioritize replacements with seismically designed stabilizing methods.	Ongoing	POBH	POBH (Port Mgr., Harbor-Master) POBH	POBH Engineer-of-Record	X	X
1	Ensure that new infrastructure components are adequately designed to minimize risk from natural hazards.	Ongoing	POBH	POBH (Port Mgr., Harbor-Master)	POBH Engineer-of-Record	X	X
1	Inventory system infrastructure locations subject to flood damages, including scour/erosion.	Ongoing	POBH	POBH (Port Mgr., Harbor-Master)	POBH Engineer-of-Record	X	X
3	Sport Basin, 92 (Phase I)* plus 90 additional (Phase II)** pole pile replacements-Described on pages 11 & 12.	2018/2019 2019/2020	*FEMA, PA/*406 **HMGP, CDBG	POBH (Port Mgr., Harbor-Master)	IFA/BO POBH Engineer-of-Record FEMA/OEM	X	X
7	Boardwalk, N. Deck-Described on page 12.	2018	PDM, AOA, CDBG, OEM, POBH	POBH (Port Mgr., Harbor-Master)	IFA/BO Engineer-of Record FEMA/OEM	X	X
2	Sport Basin Boat Launch-Described on page 12.	2018	OSMB, POBH, AOA	POBH (Port Mgr.,		X	X

				Harbor-Master)	**OSMB**		
8	**Commercial Basin-repair of 6 walkways and floating dock slips--Described on page 12 & 13.**	**2018/2019**	**PDM, POBH, CDBG, AOA**	**POBH (Port Mgr., Harbor-Master)**	**IFA/BO Engineer-of Record FEMA/OEM**	**X**	**X**
4	**Upland Storage Area-Aboveground fuel storage, fuel, water, wastewater, electrical service line support structure-Described on pages 13 & 14.**	**2018**	**PDM, POBH CDBG, AOA**	**POBH (Port Mgr., Harbor-Master)**	**IFA/BO Engineer-of Record FEMA/OEM**	**X**	**X**
10	**Ice House/Cold Storage & Docks Areas-Stormwater drainage-Described on page 14.**	**2020**	**POBH, CDBG, PDM, AOA, OEM**	**POBH (Port Mgr., Harbor-Master)**	**IFA/BO Engineer-of Record FEMA/OEM**	**X**	**X**
6	**Embankment Repair, via H-pile/concrete section stabilization-Described on pages 14 & 15.**	**2018 - 2021**	**POBH, CDBG, AOA**	**POBH (Port Mgr., Harbor-Master)**	**IFA/BO Engineer-of Record FEMA/OEM**	**X**	**X**
5	**Commercial Receiving Docks-Described on page 16.**	**2018 - 2022**	**CDBG, POBH, OEM, PDM, AOA**	**POBH (Port Mgr., Harbor-Master)**	**IFA/BO Engineer-of Record FEMA/OEM**	**X**	**X**
11	**RV Park Protection-Described on pages 16 & 17.**	**2020/2021**	**HMGP, AOA CDBG, USDA, POBH**	**POBH (Port Mgr., Harbor-Master)**	**IFA/BO Engineer-of Record FEMA/OEM**	**X**	**X**
9	**Transient Dock Repair--Described on page 12.**	**2019**	**PDM, HMGP, POBH, AOA**	**POBH (Port Mgr., Harbor-Master)**	**IFA/BO Engineer-of Record FEMA/OEM**	**X**	**X**

AOA-Any Other Funding Source Available **BO-**Business Oregon **CDBG-**Community Development Block Grant
FMA-Flood Mitigation Assistance **OSMB**-Oregon State Marine Board **IFA**-Infrastructure Finance Authority
POBH-Port of Brookings Harbor **PDM**- Pre-Disaster Mitigation Grant Program

5.0 NHMP : ADOPTION, IMPLEMENTATION AND MAINTENANCE

5.1 Overview

For a NHMP to be effective, it has to be implemented gradually over time, as resources become available. An effective NHMP must also be continually evaluated and periodically updated. The mitigation action items included in the POBH 's NHMP will be accomplished effectively through a process which routinely considers and incorporates hazards and cost-effective mitigation into ongoing decision-making and capital improvement spending.

The following sections explain how the District has adopted and will implement and maintain the vitality of the District's NHMP.

5.2 Natural Hazards Mitigation Plan Adoption

Board of Directors Resolution Adopting the Port of Brookings Harbor's (POBH's) NHMP

Resolution Number 491

The POBH resolves as follows:

Whereas, the POBH has determined that it is in the best interest of the District to establish, implement, and actively maintain a NHMP to reduce the long-term risks from natural hazards to POBH , and

Whereas, the POBH recognizes that the Federal Emergency Management Agency (FEMA) requires the District to have an approved NHMP as a condition of eligibility for receiving certain pre- and post-disaster FEMA mitigation grant funds. Now, therefore, be it resolved by the POBH as follows:

The POBH adopts the NHMP.

Passed by the POBH Board on the Sixth day of April, 2018.

See Attachment G for the copy of this Section 5.2 with Signatures and Titles below.

5.3 Implementation

The Port Manager will have the lead responsibility for implementing the POBH 's NHMP, with ongoing support from the members assigned by the POBH Board of Commissioners.

5.3.1 Existing Authorities, Policies, Programs, Resources and Capabilities

All special districts in Oregon have much narrower domains of authority than do cities and counties. The POBH's authorities are limited to constructing and maintaining its facilities and providing service to its customers.

As a special district, the POBH does not participate in the National Flood Insurance Program (NFIP).

The District's policies and programs that are related to hazard mitigation may be found in its Strategic Business Plan. The District's resources for hazard mitigation include staff responsible for these activities, and in a more limited way, funds and equipment, as supplemented by contractors and consultants when needed .

The POBH has the necessary human resources to ensure that the District's NHMP will be an actively used planning document. District staff has been active in the preparation of the NHMP, and have gained an understating of the process and the desire to integrate the NHMP into ongoing capital budget planning. Through this linkage, the District's NHMP will be kept active and be a working document.

District staff has broad experience with planning and facilitating community input. This broad experience is directly applicable to hazard mitigation planning and to implementation of mitigation projects. If specialized expertise is necessary for a particular project, the District will contract with a consulting firm or other entity on an as-needed basis.

To ensure efficient, effective and timely implementation of the identified mitigation action items, the POBH will use the full range of its capabilities and resources and those of the community.

The District's goal is to implement as many of the elements of its mitigation strategy (action items) over the next five years as possible, commensurate with the extent of funding that becomes available.

5.3.2 Integration into Ongoing Programs

As noted above, the POBH 's ongoing programs are more narrowly defined than those for cities and counties.

An important aspect of the NHMP's integration into ongoing plans and programs will be the inclusion of the NHMP's hazard identification, vulnerability, and risk evaluations and mitigation action items into ongoing comprehensive planning, capital improvement planning, operations, and other district activities. These include things such as system maintenance, periodic replacements or upgrades of infrastructure or modernization of facilities and future siting and construction of new infrastructure.

5.3.3 Cost Effectiveness of Mitigation Projects

When the POBH considers whether or not to undertake specific mitigation projects or evaluate how to decide between competing mitigation projects, we must address questions that don't always have obvious answers, such as:

What is the nature of the impacts?

How frequent and how severe are the hazard impacts?

Who would benefit from the action and who would be disadvantaged if it were not undertaken?

Are our mitigation projects likely to be eligible for FEMA funding or will other funding sources be used?

The POBH recognizes that benefit-cost analysis is a powerful tool that can help provide solid, defensible answers to these difficult socio-political-economic-engineering questions. Benefit-cost analysis is required for all FEMA-funded mitigation projects, under both pre-disaster and post-disaster mitigation programs.

However, regardless of whether or not FEMA funding is involved, benefit-cost analysis provides a sound basis for evaluating and prioritizing possible mitigation projects for any natural hazard. Thus, the district will use benefit-cost analysis and related economic tools, such as cost-effectiveness evaluation, to the extent practicable in prioritizing and implementing mitigation actions.

5.3.4 STAPLEE Process

The POBH will also use the STAPLEE methodology to evaluate projects based on the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) considerations and opportunities for implementing particular mitigation action items in the district. The STAPLEE approach is helpful for doing a quick analysis of the feasibility of proposed mitigation projects. The following paragraphs outline the District's STAPLEE Approach.

Social:

- Is the proposed action socially acceptable to the community?
- Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- Will the action cause social disruption?

Technical:

- Will the proposed action work?
- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action in light of other goals?

Administrative:

- Is the action implementable?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff, and technical support available?
- Are there ongoing administrative requirements that need to be met?

Political:

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

Legal: Include legal counsel, land use planners, and risk managers in this discussion.

- Who is authorized to implement the proposed action?
- Is there a clear legal basis or precedent for this activity?
- Will the district be liable for action or lack of action?
- Will the activity be challenged?

Economic:

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)?
- How will this action affect the fiscal capability of the district?

- What burden will this action place on the tax base or economy?
- What are the budget and revenue effects of this activity?

Environmental:

- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

5.4 NHMP Maintenance and Periodic Updating

5.4.1 Periodic Monitoring, Evaluating and Updating

Monitoring the POBH 's NHMP is an ongoing, long-term effort. An important aspect of monitoring is a continual process of ensuring that mitigation action items are being implemented and that the goals, objectives, and priorities established during the development of the District's NHMP remain current. The District has developed a process for regularly reviewing and updating the NHMP.

As noted previously, the Port Manager, will have the lead responsibility for implementing the POBH 's NHMP and for periodic monitoring, evaluating and updating of the NHMP. There will be ample opportunities to incorporate mitigation planning into ongoing activities and to seek grant support for specific mitigation projects.

The POBH 's NHMP will be reviewed annually as well as after any significant disaster event affecting the District. These reviews will determine whether there have been any significant changes in the understanding of hazards, vulnerability and risk, community profile, or any significant changes in goals, objectives and action items. These reviews will provide opportunities to incorporate new information into the NHMP, remove outdated items, and document completed action items. This will also be the time to recognize the success of the District in implementing action items contained in the NHMP. Annual reviews will also focus on identifying potential funding sources for the implementation of mitigation action items.

The periodic monitoring, evaluation and updating will assess whether or not, and to what extent, the following questions are applicable:

1. Do the NHMPs goals, objectives and action items still address current and future expected conditions?
2. Do the mitigation action items accurately reflect the District's current conditions and mitigation priorities?

3. Have the technical hazard, vulnerability and risk data been updated or changed?
4. Are current resources adequate for implanting the District's NHMP? If not are there other resources that may be available?
5. Are there any problems or impediments to implementation? If so, what are the solutions?
6. Have other agencies, partners, and the public participated as anticipated? If no, what measures can be taken to facilitate participation?
7. Have there been changes in federal and/or state laws pertaining to hazard mitigation in the District?
8. Have the FEMA requirements for the maintenance and updating of NHMPs changed?
9. What can the District learn from declared federal and/or state hazard events in other special districts that share similar characteristics to the POBH , such as vulnerabilities to earthquakes and tsunamis?
10. How have previously implemented mitigation measures performed in recent hazard events? This may include assessment of mitigation action items similar to those contained in the District's NHMP, but where hazard events occurred outside of the District.

The Board of Commissioners will review the results of these NHMP assessments, identify to the Board of POBH the actions that may be necessary to bring the NHMP back into conformance with the stated goals and objectives. Revisions of the NHMP will be taken to the POBH 's Board for formal approval as part of the District's ongoing NHMP maintenance and implementation program.

5.4.2 Continued Public Involvement and Participation

Implementation of the NHMP must continue to engage the entire community. Continued public involvement will be an integral part of the ongoing process of incorporating mitigation planning into capital planning and related activities within the communities served by the District, as well as of updating the NHMP.

The POBH NHMP will be available on the District's website. The POBH is committed to involving the public directly in the ongoing review and updating of the NHMP. This public involvement process will include public participation in the monitoring, evaluation and updating processes outlined in the previous section. Public involvement will intensify as the next 5-year update process unfolds. This process will provide the public with accessible and effective means to express their concerns, opinions, and ideas about any updates/changes that are proposed to the NHMP.

6.0 BENEFIT/COST ANALYSIS - PRELIMINARY

6.1 Methodology

The benefit-cost analysis (BCA) approach used in this analysis is a very conservative, lower-bound type approach in several important regards:

- The categories of damages and losses considered include present and expected physical damages to Brookings Harbor facilities. Damages to boats, economic losses to Brookings Harbor or to boat owners, including commercial fisherman, are not included in the BCA.
- Damages in all frequencies of storm surge events are included in the BCA, even though the proposed mitigation project would reduce damages in such events.
- For distant earthquake tsunamis, only events comparable to the March 2011 event are considered. Smaller distant earthquake tsunami events are not included in the BCA, even though the proposed mitigation project would reduce damages in such events.
- Cascadia Subduction Zone earthquake tsunamis are not considered in the BCA. We assume that damages and losses for these extreme events will be identical with and without mitigation; that is, that the proposed mitigation project has no benefits for such events. More realistically, the proposed mitigation project might result in somewhat lesser damages, even for severe tsunamis.

6.2 Data Inputs for Benefit-Cost Analysis

6.2.1 Floods/Storm Surge Events

As described in Section 3.0, Hazard Identification, Vulnerability, and Risk Assessment, of this NHMP, accelerated deterioration of vulnerable structures by the impacts of natural hazards, primarily Floods/Storm Surge, is attacking, and, in some cases demonstrated above, crippling the ability of the POBH to serve its residents, businesses and visitors.

This NHMP identifies mitigation actions that would be needed to halt and reverse the increasing losses of utility and function at Sport Basin (Basin 1), the Boardwalk North Deck, the Transient Dock, the Commercial Basin (Basin 2) Docks, Fuel Dock Upland Storage Area Landing, Embankments, RV Area and the Commercial Receiving Docks.

Based on the present observed rate of loss of utility of these above listed service areas, it is expected that 10% of the Sport Basin (Basin 1) capacity, 100% of the Boardwalk North Deck, 25% of the Transient Dock, 48% of the Commercial Docks (Basin 2), 100% of the Fuel Dock Upland Storage Area Landing, 75% of the embankments and 68% of the Commercial Receiving Docks will not be practically available to the POBH within the next 5 – 7 years, approaching 100% loss of all above-listed service areas, and thus the effective loss of the POBH in its entirety, occurring over the next 7 – 10 years.

Thus POBH would be in the position that it was no longer able to operate. The importance of this NHMP is therefore very evident to the Board of Commissioners and Port Management.

For the purposes of this NHMP, the economic impact is evaluated below.

6.3 Results

Section 1.0 of this NHMP identifies the following economic benefits for the operation of this Port:

1) Totally Port related Oregon Employment of 860 jobs (706 direct and 150 for indirect/induced);
2) Oregon output (gross sales) were nearly $67.9 million ($40.9 million direct and $27. million in direct/induced);
3) Oregon real Gross Domestic Product of $39.4 million ($22.65 million direct and $16.78 million in direct/induced);
4) Oregon labor income of $23.93 million ($12.89 million direct and $11.05 million in direct/induced);
5) Annual local and Oregon tax revenue/payments of $4.21 million ($1.26 million in local and $2.95 million in state tax revenues);
6) Annual federal tax/payments by Oregon enterprises and employees of $5.12 million.

Based on the assessment of the condition of the above-listed areas and facilities and their observed rate of deterioration, a 100% loss overall for the inter-dependent above-listed five items (employment, gross sales, real Gross Domestic Product, labor income and state/federal taxes would exceed $119,023,000 over the next 7 - 10 years.

The benefit/cost ratio, when considering the direct and indirect gross sales benefit /estimated mitigation costs over the next 7 - 10 years, would be about 2.6. When considering the direct and indirect total economic benefit provided by the POBH/estimated mitigation costs over the next 7 - 10 years, the benefit/cost ratio would be about 4.5.

7.0 Potential Funding Sources

7.1 POBH Resources

A Benefit/Cost Analysis (BCA) for the **TSUNAMI & WINTER STORM MITIGATION PROJECT** (see *Attachment F-1*), focusing only on the immediate need for reinforcing dock piles in the North Basin of the POBH was submitted in January, 2017, to the HMP. Therein, in Section 4.2.2, it is stated:

"Historical storm surge damage data were compiled by West Consultants, Inc. (2004) in their study for the Portland District, USACE. Additionally damages caused by the December 2015 storm surges are provided in this Table. Most recently, due to the cited declared storm disaster in 12/15, damage to the Sport Basin has accelerated to an estimated $82,000. Five piles have toppled or leaned, threatening safety and property, reducing Port income by the destruction of useable docks and slips. This damage is the tip of the iceberg".

This BCA details one of the many immediate challenges faced by the POBH on a daily basis. Regular maintenance and repair, attempting to keep up with degrading facilities as described in Section 3.1 of this NHMP, utilizes and exhausts the annual POBH budget.

7.2 Other Potential Resources

Oregon utilizes a number of local, state and federal funding sources to support natural hazard mitigation projects and planning. In general, FEMA Hazard Mitigation Assistance (HMA) grants figure prominently in the state's funding strategy. Several of the grant programs are available "pre-disaster" while others are available only after a federally declared disaster has occurred.

State funding to support hazard mitigation and risk reduction remains limited. However, Oregon has an excellent track record of leveraging limited local resources to successfully complete mitigation planning and projects throughout the state. State funding often consists of "General Fund" money that pays for the labor costs of state officials who are working to support local and statewide hazard mitigation activities. These labor costs are often used as non-federal costshare for projects that are otherwise federally funded. For example, all of OEM's mitigation staff are funded in part by state dollars that are used to match other federal, homeland security based funding sources. Notably, the majority of state-level staff positions dedicated to hazard mitigation planning and implementation (and a growing number of those at the local level) are funded through federal programs or grants.

Chief among the federal funding sources used to support local mitigation planning in Oregon is FEMA's Pre-Disaster Mitigation Grant Program (PDM). PDM funds generally support one or more local mitigation projects each year as well.
The Flood Mitigation Assistance Program (FMA) provides federal funds for flood flood mitigation projects. FEMA's Risk MAP Program also provides funding for hazard studies, flood mapping products, risk assessment tools, mitigation, and planning and outreach support.

Post-disaster, the Hazard Mitigation Grant Program (HMGP), Public Assistance (PA) Program, and Small Business Association's (SBA) Physical Disaster Loan Program each support varying levels and types of mitigation planning and projects. Oregon has experienced ten presidentially declared disasters over the past 10-years. Each of these disaster declarations has opened up funds through HMGP that Oregon has used to support local and statewide hazard mitigation planning as well as numerous local mitigation projects. In addition, cities, counties and special districts utilize a variety of funding mechanisms to support local mitigation projects. Capital improvement funds, service fees, general funds, levies and local grants are used to support mitigation projects across Oregon. For example, Lincoln County voters have approved several bond measures that specifically supported the relocation of schools outside the tsunami inundation zone. In one case, local bond funds leveraged the first FEMA supported (PDM) tsunami school buy-out in the nation. These examples reflect the creative, innovative and pro-active methods communities in Oregon are using to support risk reduction.

7.2.1 Federal Funding Sources Pre-Disaster

Unified Hazard Mitigation Assistance (HMA)

According to the 2013 HMA Program Guidance, U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) HMA programs present a "...critical opportunity to reduce the risk to individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds."

HMA programs include the
1) Pre-Disaster Mitigation Grant
Program;
2) Flood Mitigation Assistance Program; and
3) Hazard Mitigation Grant Program.

Together, they fund hazard mitigation plans and projects and span pre- and post-disaster environments. HMA programs are intended to reduce community vulnerability to disasters.

Specific information about each HMA grant program is presented below.

Pre-Disaster Mitigation Grant Program

The annual Pre-disaster Mitigation Program grants funds for:

1) Mitigation planning;
2) Non-flood mitigation projects; and
3) Flood mitigation projects

PDM funds support several local mitigation plan updates in Oregon each year. Like FMA, PDM is administered by OEM as the applicant (grantee when funded), who works with eligible subapplicants and then as sub-grantees to implement their funded projects.

The State IHMT has a long standing relationship with the University of Oregon's Partnership for Disaster Resilience, who has facilitated the creation and update of the majority of Oregon's local plans using PDM grants. OPDR will continue in this role into the future. PDM grants have sometimes been sub-awarded to individual cities and counties to complete their mitigation plans. Sub-awards to cities will continue to be made on a case-by-case basis. Sub-awards also have been made to DLCD for local plan updates. As the state's regulatory land-use planning agency, DLCD not only assists jurisdictions with their hazard mitigation plan maintenance, but also facilitates integration of plan action items into local comprehensive plans.
FEMA's Risk MAP program supplements these hazard mitigation plan efforts by providing funding for hazard studies, flood mapping products, risk assessment tools, mitigation, and planning and outreach support. DLCD is Oregon's Risk MAP coordinating agency. FEMA also has awarded Risk MAP funds to OPDR and the Department of Geology and Mineral Industries to complete specialized studies.
PDM can also be used to fund flood and non-flood mitigation projects. The state generally uses FMA to fund flood mitigation projects and PDM for non-flood hazard mitigation projects.

However, the State may reconsider this position because of a FEMA Mitigation Policy Directive dated June 18, 2014 (FP 204-078-112-1) that allows PDM to be used for projects related to the construction, demolition, or improvement of dams, dikes, levees, floodwalls, seawalls, groins, jetties, breakwaters, and certain erosion control projects.

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) Program was authorized by the National Flood Insurance Reform Act of 1994 and amended by the Biggert-Waters Flood Insurance Reform Act of 2012. Among other provisions, the amendments dissolved the Severe Repetitive Loss and Repetitive Flood Claims Programs, incorporating their provisions into other existing programs. The FMA Program provides Federal grant funds to pay for up to 100% of the cost of eligible mitigation activities, such as acquiring and demolishing, or elevating SRL structures.

In some cases, moving a structure out of the floodplain to high ground (relocation) is a practicable alternative. In addition, mitigated properties may qualify for reduced flood insurance rates.

The overall goal of the Flood Mitigation Assistance (FMA) Program is to fund cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other National Flood Insurance Program (NFIP) insurable structures.

The Oregon Military Department's Office of Emergency Management is the applicant for FMA Program grants; cities and counties are eligible sub-applicants. OEM submits project subapplications for FEMA's consideration in accordance with FEMA and State priorities for the annual grant offering. FEMA's priorities are set forth each year in the grant solicitation. The State then ranks qualifying projects accordingly to ensure a high likelihood of grant award. OEM, with assistance from DLCD, annually reaches out to communities with FEMA-identified SRL and RL properties before FEMA's formal program announcement to make them aware of the program, to train potential sub-applicants on the application and grants management process, and to collect information necessary to develop projects, including owner's willingness to participate voluntarily. Once FEMA releases a formal program announcement, OEM and DLCD follow up with specific technical assistance to help develop sub-applications for projects that are both ready to proceed and most likely to receive grant funding.

The FMA Program also offers funding for:

1) Planning - to prepare flood mitigation plans (as part of a community's natural hazards mitigation plan); and
2) Management Cost Funding - for the sub-grantee and grantee to help administer the FMA program and activities.

Although FMA can provide federal funds for flood hazard planning, Oregon generally does not pursue planning grants under FMA because funds can only be used to update the flood hazard chapter of a local mitigation plan and we are generally successful at developing and updating all hazards mitigation plans through the annual Pre-Disaster Mitigation Program (PDM).

NOAA Coastal Zone Management Program

Coastal Zone Management Program works with coastal states and territories to address a wide range of issues including climate change, coastal hazards, coastal development, public access, habitat protection, water quality, ocean governance and planning, and planning for energy facilities. Key elements of the program include:

1) Protecting natural resources,
2) Managing development in high hazard areas,

3) Giving development priority to coastal-dependent uses,
4) Providing public access for recreation,
5) Prioritizing water-dependent uses, and
6) Coordinating state and federal actions.

While the legislation includes basic requirements for state partners, it also allows the flexibility needed to design programs that best address local challenges and work within state and local laws and regulations. By using both federal and state funds, the program strengthens the capabilities of each partner to address coastal issues.

National Fire Plan

Under the National Fire Plan (NFP), funding opportunities for local WUI planning, prevention and mitigation projects first became available in 2000. Since that time, Oregon has aggressively sought funding for a wide variety of projects, including fuels reduction work, education and prevention projects, community planning, and alternative uses of fuels. As of early 2007 the ODF had received approximately $25 million. The majority of these monies have been used to fund fuels reduction projects on individual properties and to establish community fuel breaks in the most wildfire prone portions of the state. NFP funds have also been used to expand fire prevention efforts, to educate local officials about how they may help address the WUI situation, to implement Senate Bill 360, to improve public awareness about the wildfire problem, and to better identify areas especially exposed to wildland fire.

7.2.2 Federal Funding Sources Post-Disaster

Hazard Mitigation Grant Program

FEMA's Hazard Mitigation Grant Program (HMGP) was created in November 1988 under the authority of the Stafford Act, Section 404. The HMGP assists states and local governments to implement long-term hazard mitigation measures following a Presidential major disaster declaration. Initially, the federal cost-share for projects was established at 50%; however, in 1993 that portion was increased to 75% of a project's total eligible costs. Objectives of HMGP include:

1) preventing loss of lives and property due to disasters;
2) implementing state and local hazard mitigation plans;
3) enabling mitigation measures to be implemented during immediate recovery from a disaster; and
4) providing funding for previously identified mitigation measures that benefit the disaster area.

Effective November 2004, the state and its applicants must minimally have a FEMA-approved natural hazards mitigation plan (44 CFR Section 201) to qualify for HMGP funding. Eligible applicants for the HMGP are the same as for the Public Assistance Program (Stafford Act, Section 406):

1) state and local governments (including special districts);
2) certain private nonprofit organizations or institutions; and
3) Native American nations and authorized organizations (in Oregon these entities have a direct relationship with FEMA and do not apply through the state).
4) Homeowners and businesses, whose properties can benefit from hazard mitigation measures, cannot apply directly for HMGP funding, but rather must be represented by an eligible applicant, such as the city or county where their project is located.
HMGP activities are managed by the Office of Emergency Management as grantee.

The state develops a program administrative plan, solicits applicant interest and project applications, establishes priorities and selection criteria, reviews and selects projects. FEMA reviews all projects submitted by the state, conducts the required environmental reviews and benefit/cost analyses, and approves projects for funding.

The amount of HMGP funding available to the state is calculated at 15% of the federal funds spent on FEMA Public Assistance and Human Services Programs (minus administrative expenses) for each disaster. When a state has a FEMA-approved *enhanced* state hazard mitigation plan (Section 201.5), the calculated amount of HMGP funding increases to 20% of the federal funds spent on FEMA Public Assistance and Human Services Programs.

HMGP allows the state to set-aside up to 5% of the total obligation for projects that are not specifically hazard mitigation, such as warning systems.
Another set-aside of 7% of the total HMGP obligation can be earmarked to state and local naturals hazards mitigation planning.

Although HMGP project funding is intended for use in the disaster-declared counties, it can be, at the state's request, used in non-declared counties for eligible hazard mitigation projects.

Public Assistance Program

The FEMA Public Assistance (PA) Program (Stafford Act, Section 406) provides disaster response and recovery assistance to communities following a Presidential Disaster Declaration. PA primarily supports debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. However, PA also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process. Federal assistance is provided at 75% or more of the eligible costs with the balance of funds provided by the grantee/sub-grantee.

Physical Disaster Loan Program

When Physical Disaster Loans are made to homeowners and businesses by the U.S. Small Business Administration (SBA) following disaster declarations, up to 20% of the loan amount can go toward specific measures taken to protect against recurring damage in similar future disasters.

Increased Cost of Compliance (ICC)

The standard Flood Insurance Policy has a provision that will pay the policy holder to comply with a state or local floodplain management law or ordinance regulating repair or reconstruction of a structure that has suffered flood damage and meets other eligibility criteria, such as receiving a substantial damage or repetitive loss determination from a local official. Mitigation activities eligible for payment are: elevation, floodproofing, relocation, or demolition (or any combination of these activities) of the structure. The private-party premium payments are considered non-federal cost share as long as the claim is made within the timeframes allowed by the NFIP. In addition, if the ICC payment is being used as a sub-applicant's non-Federal cost share, the NFIP policy holder must assign the claim to the subapplicant (city or county).Policyholders may receive up to $30,000 under this coverage.

7.2.3 Federal Funding Sources Pre- and Post-Disaster

Community Assistance Program – State Support Services Element (CAP-SSSE)

The CAP-SSSE program is part of the NFIP. It provides grants to states at 75% with a 25% nonfederal match to evaluate local governments' NFIP performance and provide technical assistance to help communities successfully implement the various facets of the NFIP. These funds cover the following activities and more:

1) Strategic Planning
2) Ordinance Assistance
3) Community Assistance Visits
4) Outreach, Workshops and Other Training
5) General Technical Assistance
6) Mapping Coordination Assistance
7) Assistance to Communities in Responding to Disasters

7.2.4 State Funding Sources

General Fund

State general fund money pays for the labor costs of state officials working on mitigation projects for their agencies; these labor costs can be used as non-federal cost-share for projects that are otherwise federally funded.

The state also occasionally contributes cash match through one of several funding mechanisms, such as portions of state agency budgets funded by a state source of revenue.

Seismic Rehabilitation Grant Program

The Seismic Rehabilitation Grant Program (SRGP) provides state funds to strengthen public schools and emergency services buildings so they will be less damaged during an earthquake. Administration of the SRGP was transferred from the Oregon Office of Emergency Management (OEM) to Business Oregon's Infrastructure Finance Authority (BusOR-IFA) on January 1, 2014. The SRGP is a competitive grant program that provides state funds on a reimbursable basis for seismic rehabilitation of critical public buildings:

1) Hospital buildings with acute inpatient care facilities;
2) Fire stations;
3) Police stations;
4) Sheriffs' offices; and
5) Other facilities used by state, county, or district municipal law enforcement agencies.

SRGP grants are awarded on a competitive basis, and the maximum grant award is $1.5 million.

Community Development Block Grant

Community Development Block Grants (CDBG) are made available to communities in the State of Oregon, usually via the Infrastructure Finance Authority with funding provided by the U.S. Department of Housing and Urban Development (HUD). While these grants originate with a federal agency, the funding is usually considered non-federal for matching grant purposes (i.e., CDBG can usually be utilized as non-federal match to other federal funding sources).

In 1981 Congress amended the Housing and Community Development Act of 1974 (HCD Act) to give each state the opportunity to administer CDBG funds for non-entitlement areas. These areas include those local governments that do not receive CDBG funds directly from HUD as part of the entitlement program (entitlement cities and urban counties). Non-entitlement areas are cities with populations of less than 50,000, and counties with populations of less than 200,000 although some entitlement cities have a population of less than 50,000 (cities that are designated central cities of metropolitan statistical areas).

The primary statutory objective of the CDBG Program is to develop viable communities by revitalizing neighborhoods, expanding affordable housing and economic opportunities, and improving community facilities and services, principally for persons of low and moderate income.

The state must ensure that a specified percent of its CDBG grant funds are used for activities that benefit low and moderate-income persons over a three-year time period.

However, states may also use their funds to meet other urgent community development needs. A need is considered urgent if it poses a serious and immediate threat to the health or welfare of the community, has arisen in the past 18 months, and the project serves primarily low to moderate-income residents. For example, funds can be used as the non-federal match for eligible HMGP, PDM, and FMA Program projects.

Community Development Block Grant – Disaster Recovery

In addition to CDBG funds made available to the state on an annual basis, special HUD funding can become available to the state as a result of natural disasters. This HUD assistance supplements assistance from FEMA and other federal agencies. Traditionally, funds provided via HUD disaster recovery initiatives can be used for long-term recovery efforts, property acquisitions, relocations, and other efforts to reduce future damage. The program is intended to give communities flexibility in meeting local needs quickly. Unless restricted by regulation, these funds can also be used as non-federal, local match for eligible HMGP, PDM, and FMA Program projects.

Oregon Watershed Enhancement Board

Previously known as the Governor's Watershed Enhancement Board (GWEB), the Oregon Watershed Enhancement Board (OWEB) was created by the 1987 Oregon Legislature. OWEB is charged with supporting implementation of *The Oregon Plan for Salmon and Watersheds*, which includes the Oregon Coastal Salmon Restoration Initiative (OCSRI) and the Healthy Streams Partnership.

In 1995 the Legislature directed OWEB to provide support to watershed councils. OWEB directs a grant program through the Natural Resources Division of the Oregon Department of Agriculture by which each of the state's 45 soil and water conservation districts may apply for funds for watershed enhancement projects.

While OWEB's primary responsibilities are implementing projects addressing coastal salmon restoration and improving water quality statewide, these projects can sometimes also benefit efforts to reduce flood and landslide hazards. In addition, OWEB conducts watershed workshops for landowners, watershed councils, educators, and others, and conducts a biennial conference highlighting watershed efforts statewide.

Funding for OWEB programs comes from the general fund, state lottery, timber tax revenues, license plate revenues, angling license fees, and other sources. OWEB awards approximately $20 million in funding annually.

Oregon Local Disaster Assistance Loan and Grant Account

Through the Local Disaster Loan and Grant Account, the Oregon Legislature makes loans to local governments, special districts, and school districts to match federal disaster relief funding for federally declared disasters. It also provides loans and grants to the same entities for paying the costs of responding to disasters whether or not they are federally declared. The Oregon Military Department may use a small percentage of the loan amount to cover the cost of administering the loan. Prior to the 2012 legislative session, this account was a source of loans only. The 2012 Oregon Legislature amended the program to make this account a source of grant funds as well.

8.0

Supplemental Documentation