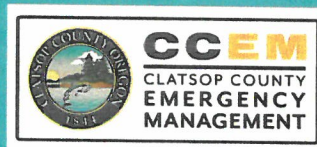




# CLATSOP COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN 2020

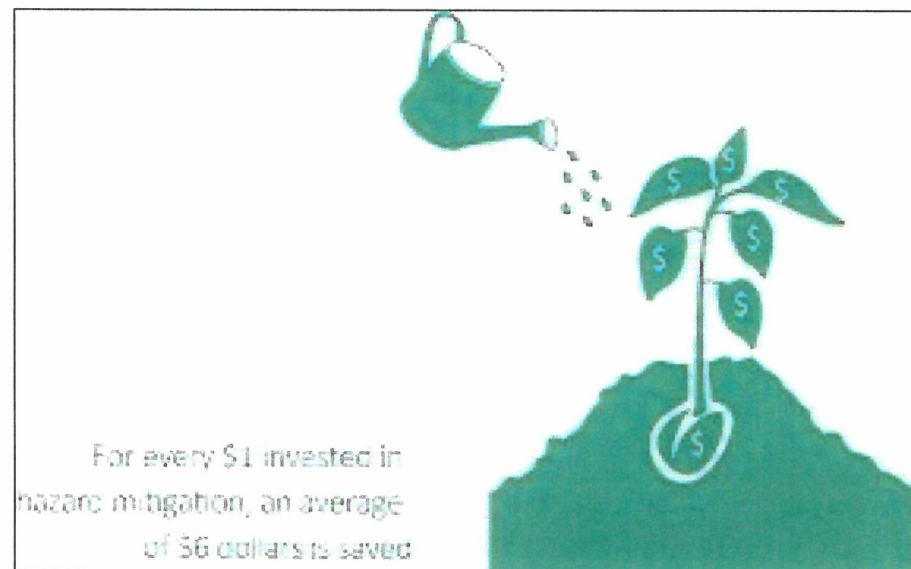
*A Whole Community Approach to Reducing Disaster Risk & Vulnerability*

Tiffany Brown, Emergency Manager  
December 9, 2020

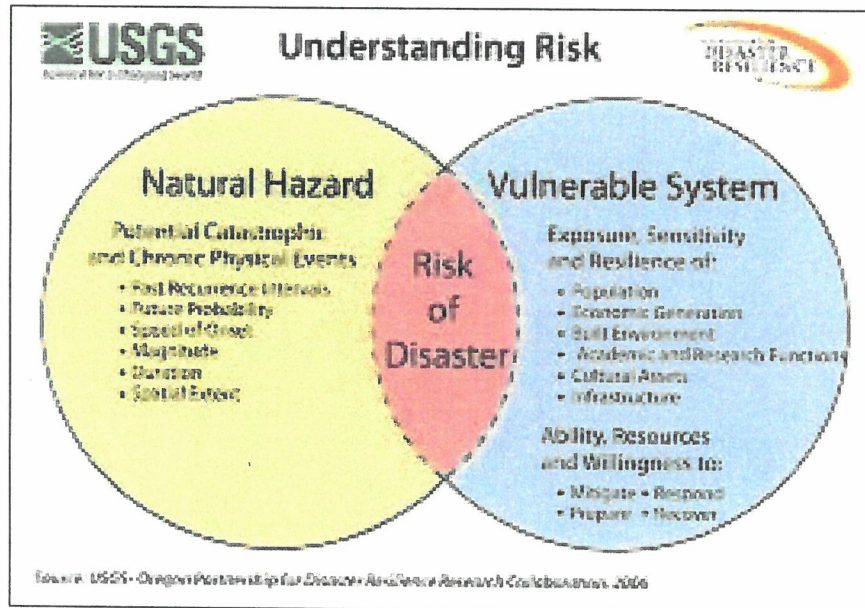


# Overview

- Purpose
- History
- Current Plan Update
  - Project Background
  - Participants
  - Plan Roadmap
  - Stakeholder Input
  - Timeline
- Questions



# What is a NHMP?

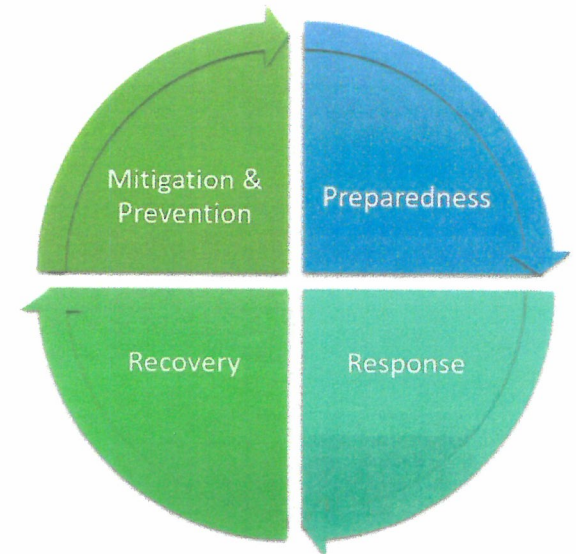


An NHMP identifies **hazards**, vulnerabilities, and risks facing a local, state, or tribal government, and prioritizes actions to reduce the risks.

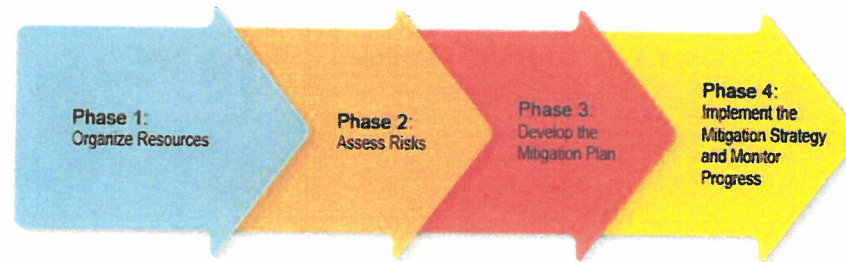
A NHMP has two core parts: a **risk** assessment and a mitigation strategy.

# Purpose

- Identify local hazards
- Improve resilience to identified hazards
- Grant Eligibility
- Whole Community process & input
- Strategic approach



# Plan History



## 2008 PLAN DEVELOPMENT

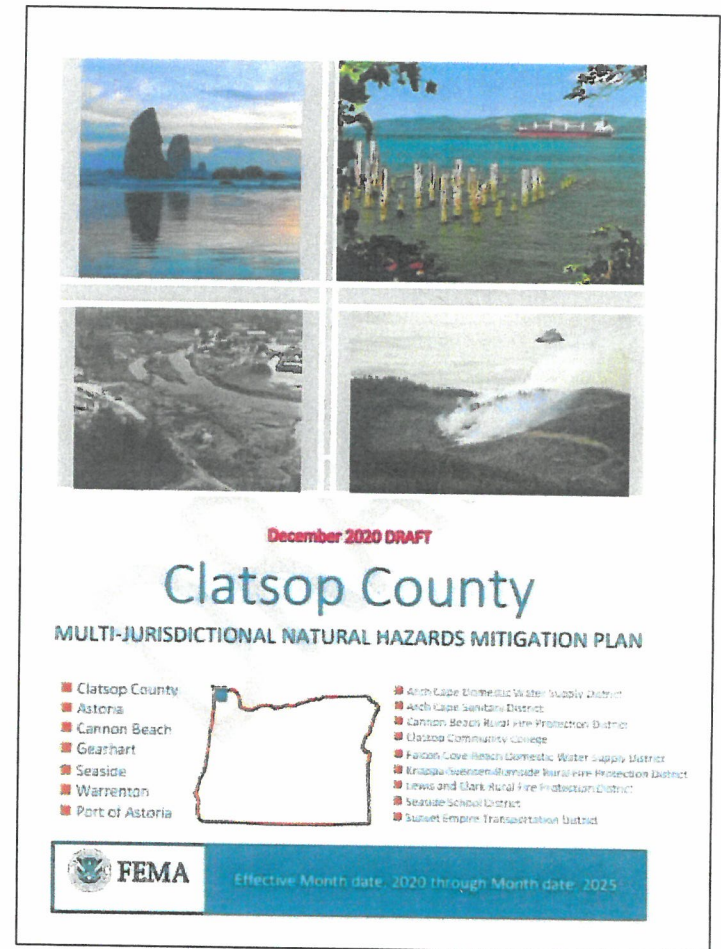
- UO Partnership for Disaster Resilience
- Formed Steering Committee
- City/County Addendums
- Action Items Developed
- Whole Community Process

## 2015 PLAN UPDATE

- Staff support
- Steering Committee participation
- City/County Addendums
- Few new action items developed
- Public survey

# 2021 MJNHMP Update

- Project kickoff: Fall 2018
- DLCD Grant Assist
- 16 Jurisdictions, including 10 special districts
- Special Districts – Fire, Education, Water/Sewer & Port
- New hazard data – Clatsop County Risk Assessment/HAZUS



# Plan Roadmap

## RISK ASSESSMENT

- Community Profile
- Natural Hazards
- Community Risk Profiles
  - HVA/Hazard Profile
  - **Mitigation Action Items**
  - Plans/Resources

## MITIGATION STRATEGY

- Goals & Objectives
- Integration
- Tools/Assets
- Economic Analysis
- Planning Process
- Appendices/Community Data

***CCEM will send the Board online plan access & public survey link by Monday, December 14.***

# Project Timeline & Stakeholder Input

December 14 - 26	Committee/Council Review
December 26 – January 15	Public Review & Survey
January 11 – 22	Schedule final Steering Committee Meeting
January 22 – February 12	OEM Preliminary Review
March 1 – 12	Council/Board Final Review
March 22, 2021	FEMA issues approval-pending-adoption (APA) letter
March 22 →	Jurisdictions adopt plan (Next update 5 years)

# Questions

A goal  
without a  
plan is just  
a wish.

— Antoine de Saint-Exupéry

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## 1. City of Gearhart

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### Hazard Vulnerability Analysis

**Table Error! No text of specified style in document.6 City of Gearhart Hazard Vulnerability Analysis**

Jurisdiction	Coastal Erosion	Drought	Earthquake	Flood	Landslide	Tsunami	Volcanic Ashfall	Wildfire	Wind/Winter Storm
Gearhart	L	L	H	-	L	H	L	H	H

Source: City of Gearhart Risk Assessment, May 2019.

#### Drought

Historically, Clatsop County has very few drought years. However, when drought conditions prevail, area creeks and fish can suffer. In addition, the surrounding Forest lands are more susceptible to disease and the Clatsop plains and forests are susceptible to wild land forest fires during drought.

#### Earthquake

The DOGAMI Risk Report for Clatsop County conducted in 2018 built upon previous studies by the department and identified locations within the study area that are comparatively more vulnerable or at greater risk to CSZ M9.0 earthquake hazard. Very high liquefaction soils are found throughout most of the populated coastal portions of Clatsop County, which include the communities of Astoria, Cannon Beach, Gearhart, Seaside, and within the low-laying areas around the City of Warrenton (DOGAMI, 2018).

#### Flood

Flooding generally occurs quickly due to heavy concentrated rainfall. Tidal changes in conjunction with high winds and/or snow accumulation at higher elevations have influence on the severity as well. Flood season is in effect from November 1 through March 31. Principal riverine flood sources in Gearhart are the Neacoxie Creek, the Neawanna Creek, and the Necanicum River.

#### Landslide

This hazard is the downslope movement of rock, soil, or other debris or the

opening of sinkholes. These hazards are often associated with other incidents such as heavy rainfall, snow melt run-off, floods or earthquakes. Our past history has been that we have frequent landslides during the rainy months on our mountain roads, highways, and city streets. The landslide hazard within Gearhart includes the erosion of ocean beaches. Beach landslides in addition to regular landslides increase this hazard in its severity level for the County.

### Tsunami

This is a series of traveling ocean waves of extremely long length and period, generated by disturbances associated with earthquakes. As it enters the shoaling water of coastlines in its path, the velocity of its waves diminishes and wave height increases. In shallow waters they can crest to heights of more than 100 feet and become a threat to life and property. The Gearhart coastline is particularly vulnerable with many residents in need of early warning.

### Volcanic Event

Little risk of impact to the City.

### Wildfire

Generally, the community is at low risk from a wildfire event due to high coastal humidity, but in the intermittent dry periods with east winds from summer to late fall, wildfire risk can elevate quickly. **Error! Reference source not found.** indicates 55% of the community is at moderate risk from wildfire.

### Windstorm and Winter Storm

Wind storms hazards are common in Gearhart and usually results in localized power outages or large-scale power outages, which can affect all of Clatsop County. Windstorms can reach hurricane strength in the exposed areas and damage to homes and property is not unusual during the winter months. Structures the most vulnerable to high winds include insufficiently anchored manufactured homes and older buildings in need of roof repair. It is essential that tie down standards are enforced. Fallen trees can be a hazard. They can block roads, rails, and affect emergency operations. They can down power and utility lines. Strategic pruning working with utility companies and establishing a tree removal and maintenance program is prudent.

## Mitigation Actions

**Table Error! No text of specified style in document.11 City of Gearhart Mitigation Actions**

#	Hazard	City of Gearhart 2020-2025 Mitigation Actions	Priority	Timeline	Status & Explanation	Lea P
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Tsunami	Relocate the Gearhart Fire Station to a site outside of the large tsunami zone.	H	2-5 yrs	A study of potential locations and a robust public process resulted in a prioritized site.	Gear FEMA,
Multi-Hazard	Develop a Community Self-Sustainability Program to provide food, shelter, hygiene, water, communication, and public utilities and services in the event of a disaster	H			
Multi-Hazard	Develop and implement a community disaster preparedness program.	H			
Multi-Hazard	Rebuild City Hall to withstand earthquakes and aid in recovery				
Multi-Hazard	Educate the community about hazards risks and hazard mitigation. Encourage participation in mitigation and community sustainability programs by holding a periodic/annual open house or town hall meeting.	H			
Multi-Hazard	Evaluate the construction of critical facilities, public utilities and service; retrofit, relocate or bury as necessary to withstand the impact of disaster.				
Multi-Hazard	Evaluate the construction of critical facilities and structures and relocate structures and facilities in the disaster-impacted areas where possible.				
Multi-Hazard	Evaluate City ordinances and capital improvement plans no less than one time each five years to ensure they require new development and provide incentives for existing development to reduce the potential for hazard.				
Multi-Hazard	Develop an emergency shelter and operations center.				
Multi-Hazard	Train Certified Emergency Response Teams (CERT) for each neighborhood.				
Coastal Erosion	Conduct a periodic survey of the vegetation on the dune and exposed sand areas. Require the maintenance of vegetation on exposed sand dune areas to increase resilience.				
Drought	Implement a water conservation plan to ensure adequate water supply.				

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Mitigation Actions**Table II-84. City of Gearhart Mitigation Actions**

Hazard	City of Gearhart 2020-2025 Mitigation Actions	Priority	Timeline	Status & Explanation	Partners/ Funding Sources
Tsunami	Relocate the Gearhart Fire Station to a site outside of the large tsunami zone.	H	2-5 yrs	A study of potential locations and a robust public process resulted in a prioritized site.	Gearhart, DLCD, FEMA, NOAA, OEM.
Tsunami	Tsunami Evacuation Route Identification	H	6-24 months	From the 2017 Gearhart Transportation System Plan, Volume 1	City of Gearhart
<p><b>ADDED</b></p> <p>PLEASE ADD ACTION ITEMS FROM THE ADDENDUM AS ARE RELEVANT</p>					
Tsunami	Retrofit structures, infrastructure, and critical facilities to reduce vulnerability to seismic activities.				
Tsunami	Develop and practice an evacuation plan.				
Tsunami	Develop an emergency shelter and operation center.				
Tsunami	Train Gearhart CERT for each neighborhood.				

Earthquake	Retrofit structures, infrastructure and critical facilities to reduce vulnerability to earthquakes.
Earthquake	Develop and practice an evacuation plan.
Flood	Comply with FEMA Floodplain recommendations for development within a floodplain.
Flood	Ensure that runoff does not pollute ground water supplies.
Flood	Implement winter storm preparation standards.
Landslide	Install drainage systems where necessary to prevent soil erosion.
Landslide	Require maintenance of vegetation on bare soils and site investigation/engineering in areas of slope hazard.
Wildfire	Ensure adequate space between structures to reduce vulnerability
Wildfire	Construct fire access roadways and turnarounds within vulnerable neighborhoods, purchase land where right-of-way is not available.
Wildfire	Retrofit sources of potential fires in a disaster such as fuel tanks.
Wildfire	Conduct periodic fire inspections for vegetative fuels reduction and maintenance program to provide fire buffer to structures.
Wildfire	Initial and maintain a routine fire inspection and prevention within the neighborhoods.

## City of Gearhart Completed/Ongoing Mitigation Actions

### Tsunami Wayfinding Signage

In 2013, the City worked with regional partners to develop new tsunami maps for the area, and a few tsunami evacuation signs were installed at that time. In 2014-15, Gearhart enhanced the wayfinding

system by installing “You Are Here” signs in four key locations to specifically direct evacuees to high ground following an earthquake/tsunami. In 2018-19, the City participated with other jurisdictions in the countywide Wayfinding Assessment project, which served to identify gaps in the wayfinding system and creating a record of existing sign location to provide an easier way to maintain the system over time. Finally, in conjunction with the 2019-20 tsunami overlay project, the city was able to secure grant funding to purchase/install signs to complete the sign system for tsunami evacuation. Future steps include maintaining and exploring ongoing opportunities for improvement as well as conducting evacuation exercises.

### **Emergency Cache Container Program**

The City launched the cache container program in Spring 2019. The COVID pandemic delayed the project initially, but first access drop off date occurred in August 2020 and the second in October 2020. The program currently maintains 7 registered drums, and 9 residents are on the waiting list for the 2021 spring event.

### **Pre-Disaster Mitigation Reserve Fund**

The city budget holds a Hazard Mitigation Fund where the fiscal year begins with \$15,000 in reserves available for planning and projects that seek to protect life and property from future natural disasters. Its existence has funded projects such as the conex bins for the soon-to-start Emergency Cache program, emergency supplies including medications and first aid, a HAM radio hut for emergency communications, and a starter supply of shelf-stable MRE's (Meals Ready to Eat).

### **Tsunami Hazard Overlay Zone Adoption**

In August 2019, the City of Gearhart adopted Ordinance No. 924 amending the Gearhart Comprehensive Plan and Zoning Ordinance to update tsunami hazard background, policies, and development standards. These components were established via Section 3.14 of the Gearhart Zoning Code—the Tsunami Hazard Overlay Zone (THOZ). The purpose of the Tsunami Hazard Overlay Zone is to increase the resilience of the community to a local source (Cascadia Subduction Zone) tsunami by establishing standards, requirements, incentives, and other measures to be applied in the review and authorization of land use and development activities in areas subject to tsunami hazards. Significant public and private investments have been made in development in areas which are now known to be subject to tsunami hazards. These standards are not intended to require the relocation of or otherwise regulate existing development within the Tsunami Hazard Overlay Zone. These standards are intended to limit, direct and encourage the development of land uses within areas subject to tsunami hazards in a manner that will reduce loss of life, reduce damage to private and public property, reduce social, emotional, and economic disruptions; and increase the ability of the community to respond and recover.

### **Tsunami Studies and Information**

The City of Gearhart was a key participant and driver for technical analyses and policy development completed by the State of Oregon with federal funding. Specifically, Oregon Coastal Management Program applied for and was successful in securing two grants from the National Oceanic and Atmospheric Administration (NOAA) to address identified gaps in local land use planning for tsunami hazards, both a Project of Special Merit (which concluded in September 2019) and a Coastal Resilience Grant (to conclude in June 2021). The Oregon Department of Geology and Mineral Industries (DOGAMI) was a lead partner in these efforts to complete innovative analyses, including time/distance evacuation modeling, called “Beat the Wave,” and casualty and building damage estimates for a local tsunami. These analyses covered many coastal jurisdictions, including the cities of Gearhart and Port Orford, all of Tillamook and Lincoln Counties, and the Coos Bay Estuary.

Leading up to the release of these publications were many in-person meetings, workshops, and open houses where the information was shared and revised (based on feedback) with elected officials, practitioners, emergency preparedness groups, and the public. This information has and will continue to help inform specific evacuation and mitigation improvement projects that will have the most impact in terms of lives saved. For example, many communities have utilized the Beat the Wave maps to inform where they place evacuation route signs to ensure the most efficient routes to safety are signed appropriately.

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# BEAT THE WAVE! TSUNAMI EVACUATION MAP GEARHART, OREGON



XXL1 Local Tsunami Event, 5-Minute Evacuation Delay, All Bridges Intact

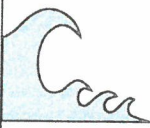
## IF YOU FEEL AN EARTHQUAKE:

- Drop, cover, and hold
- Move immediately inland to higher ground
- Do not wait for an official warning

## SI USTED SIENIE EL TEMBLOR:

- Tírese al suelo, cúbrase, y espere
- Diríjase de inmediato a un lugar más alto que el nivel del mar
- No espere por un aviso oficial

## HOW TO USE THIS MAP



Find the nearest road to your location. Check the road color and speed. Maintain this speed all the way to the safe area. If you can manage a clear and faster off-road route to the safe area, go that route!



running  
5.5+ mph  
(8+ ft/sec)



jogging  
4.1-5.5 mph  
(5-8 ft/sec)



fast walking to slow jogging  
2.7-4.1 mph  
(4-6 ft/sec)



walking  
1.4-2.7 mph  
(2-4 ft/sec)



very slow walking  
0-1.4 mph  
(0-2 ft/sec)



ASSEMBLY AREA  
A  
AREA  
REUNION

## MAP SYMBOLS

- Evacuation Flow Zone
- Evacuation route
- ⌒ Bridge
- Assembly area
- City of Gearhart Optional Assembly Area\*
- Outside hazard area for XXL1 inundation
- School
- <sup>17</sup> Tsunami wave arrival time (minutes)
- Fire department
- Law enforcement
- Hospital

SCALE  
0.5 mile  
0.5 km

\* Optional high ground areas for the City of Gearhart are being shown in case you are physically unable to get outside the hazard area or if there are important obstacles in your way (such as wetlands, dunes, lakes, or earthquake debris). This optional high ground remains dry in 85 percent of tsunami scenarios analyzed.

This map is based on modeling for a local tsunami generated by a magnitude 9.1 maximum-considered (XXL1) Cascadia Subduction Zone (CSZ) earthquake. The tsunami starts toward shore at the moment the earthquake starts, but the shaking from the earthquake can last three to five minutes. Evacuation speeds depicted on the map are minimums that must be maintained all the way to safety. If your speed falls below the minimums owing to difficult terrain such as soft sand or steep slopes, speed must be increased above the minimum in less challenging parts of the evacuation route. Users should test evacuation routes to see what speeds are necessary to reach safety before listed tsunami arrival times at safety shown on the map. Remember to factor in the estimated 5-minute evacuation delay time listed on this map. This delay is caused by earthquake shaking and common behavioral factors.

When estimating what speed you can maintain, consider your physical limitations, the possibility of evacuation at night or in bad weather, and earthquake damage to evacuation routes. Streets may be cracked or covered in wet sand from liquefaction, overhead electrical lines may be down, window glass and bricks may have fallen into the streets, and bridges may be damaged. When practicing your evacuation route, find out which bridges have and have not been designed to withstand a large earthquake. Speeds and evacuation flow zones on this map reflect the assumption that all bridges remain standing after the CSZ earthquake. Flow zones depict regions that evacuate toward a specific critical point such as bridges and are directly analogous to watershed boundaries or drainage divides in the landscape. The boundaries between evacuation flow zones are where it is equally efficient to follow two different routes to safety.

Note that this evacuation modeling approach restricts evacuation to streets and trails; thus, some cases small areas above the tsunami inundation but with no street or trail connection are ignored. If you know there is ready access to such areas, then consider these off-street routes when planning or testing your evacuation.



## NOTICE

This "beat the wave" tsunami evacuation map was developed by DOGAMI for the purpose of evaluating the most effective means to guide the public in the event of a tsunami evacuation. The map is based on preliminary data and should not be used for site-specific planning. This map adopts recommendations from the Oregon Tsunami Advisory Council. The evacuation routes were developed by local emergency officials and reviewed by the Oregon Department of Emergency Management.

MAP REVISED 08-03-15

