Oregon
Theodore R. Kulongoski, Governor

Department of Land Conservation and Development
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NOTICE OF ADOPTED AMENDMENT

11/12/2010

TO: Subscribers to Notice of Adopted Plan or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: City of Monmouth Plan Amendment
DLCD File Number 003-10

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. A Copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office.

Appeal Procedures*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: Friday, November 26, 2010

This amendment was submitted to DLCD for review prior to adoption pursuant to ORS 197.830(2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

*NOTE: The Acknowledgment or Appeal Deadline is based upon the date the decision was mailed by local government. A decision may have been mailed to you on a different date than it was mailed to DLCD. As a result, your appeal deadline may be earlier than the above date specified. NO LUBA Notification to the jurisdiction of an appeal by the deadline, this Plan Amendment is acknowledged.

Cc: Mark Fancey, City of Monmouth
Gloria Gardiner, DLCD Urban Planning Specialist
Steve Oulman, DLCD Regional Representative
Amanda Punton, DLCD Regional Representative
Chris Shirley, DLCD Regional Representative

<paa> YA

NOTICE OF ADOPTION

Must be filed within 5 working days
See OAR 660-18-040

Jurisdiction: City of Monmouth
Local File Number: LA 10-02
Date of Adoption: November 2, 2010
Date Mailed: November 4, 2010

Date Proposal was Provided to DLCD: April 7, 2010

Type of Adopted Action: (Check all that apply)

X Comprehensive Plan Text Amendment
_____ Comprehensive Plan Map Amendment
_____ Land Use Regulation Amendment
_____ Zoning Map Amendment
_____ New Land Use Regulation
_____ Other: _____
(Please Specify Type of Action)

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached."
This amendment adds updated Comprehensive Plan elements related to Statewide Planning Goal 6 (Air, Water, and Land Resource Quality) and Statewide Planning Goal 7 (Natural Hazards).

Describe how the adopted amendment differs from the proposed amendment. If it is the same, write "Same." If you did not give notice for the proposed amendment, write "N/A."
Same

Plan Map Changed from: NA to NA

Zone Map Changed from: NA to NA

Location:

Acres Involved: NA

Specify Density: Previous: NA New: NA

Applicable Statewide Planning Goals: 1,6,7,

Was an Exception Adopted? Yes: _____ No: X

DLCD File Number: 003-10 (18230) [16392]

Did the Department of Land Conservation and Development receive a notice of Proposed Amendment
FORTY FIVE (45) days prior to the first evidentiary hearing. Yes: X No: ___
If no, do the Statewide Planning Goals apply. Yes: ___ No: ___
If no, did the Emergency Circumstances Require immediate adoption. Yes: ___ No: ___

Affected State or Federal Agencies, Local Governments or Special Districts: None

Local Contact: Mark Fancey Area Code + Phone Number: (503) 751-0147
Address: 151 Main Street W
City: Monmouth Zip Code+4: 97361

ADOPTION SUBMITTAL REQUIREMENTS

This form **must be mailed** to DLCD **within 5 working days after the final decision** per ORS 197.610, OAR Chapter 660 – Division 18.

1. Send this form and **TWO (2) Copies** of the Adopted Amendment to:
   ATTENTION: PLAN AMENDMENT SPECIALIST
   DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
   635 CAPITOL STREET NE, SUITE 150
   SALEM, OREGON 97301-2540

2. Submit **TWO (2) copies** of the adopted material, if copies are bound please submit **TWO (2) complete copies** of documents and maps.

3. Please note: Adopted materials must be sent to DLCD not later than **FIVE (5) working days** following the date of the final decision on the amendment.

4. Submittal of this Notice of Adoption must include the text of the amendment plus adopted findings and supplementary information.

5. The deadline to appeal will be extended if you submit this notice of adoption within five working days of the final decision. Appeals to LUBA may be filed within **TWENTY-ONE (21) days** of the date the "Notice of Adoption" is sent to DLCD.

6. In addition to sending the "Notice of Adoption" to DLCD, you must notify persons who participated in the local hearing and requested notice of the final decision.

7. **Need more copies?** You can copy this form onto 8 ½ x11 green paper only; or call the DLCD office at (503) 373-0050; or fax your request to: (503) 378-5518; or Email your request to Larry.French@state.or.us - ATTENTION: PLAN AMENDMENT SPECIALIST.

CITY OF MONMOUTH, COUNTY OF POLK

STATE OF OREGON

An Ordinance Amending the Monmouth)
Comprehensive Plan)

ORDINANCE NO. 1284

WHEREAS, the City of Monmouth has deemed it necessary to amend the Monmouth Comprehensive Plan adding an Air, Water, and Land Resources Quality Element and a Natural Hazards Element; and

WHEREAS, the City duly notified the Oregon Department of Land Conservation and Development of the proposed Comprehensive Plan amendments not less than 45 days prior to the first evidentiary hearing and the Department did not object to the proposed changes; and

WHEREAS, the Planning Commission held a public hearing on said amendments on September 15, 2010, at which time the public was given full opportunity to be present and heard on the matter; and

WHEREAS, the City Council held a public hearing on said amendments on October 5, 2010, at which time the public was given full opportunity to be present and heard on the matter; and

WHEREAS, the City Council found and hereby finds that the proposed amendments to the Monmouth Comprehensive Plan conform to applicable Statewide Planning Goals 6 – Air, Water, and Land Resources Quality and 7 – Natural Hazards, and it is in the public interest to adopt them; NOW, THEREFORE,

THE CITY OF MONMOUTH DOES ORDAIN AS FOLLOWS:

Section 1. The City Council of the City of Monmouth does hereby adopt the Air, Water, and Land Resources Element as set forth in Exhibit A.

Section 2. The City Council of the City of Monmouth does hereby adopt the Natural Hazards Element as set forth in Exhibit B.

Read for the first time: October 19, 2010
Read for the second time: November 2, 2010
Adopted by the City Council: November 2, 2010
Approved by the Mayor: November 2, 2010

John E.D. Oberst, Mayor

ATTEST:

Phyllis L. Bolman, City Recorder

Exhibit A

Chapter XXX
Air, Water, and Land Resources Quality

Introduction

Oregon's Statewide Planning Goal 6 requires efforts to maintain and improve the quality of air, water, and land resources of the state. Goal 6 states that: "*All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules and standards. With respect to the air, water and land resources of the applicable air sheds and river basins described or included in state environmental quality statutes, rules, standards and implementation plans, such discharges shall not (1) exceed the carrying capacity of such resources, considering long range needs; (2) degrade such resources; or (3) threaten the availability of such resources*".

This goal is mainly accomplished by local compliance with state and federal regulations. A variety of state agencies administer resource quality protection programs and maintains databases about resource quality. The lead agency for such efforts in Oregon is the Oregon Department of Environmental Quality (DEQ).

The purpose of this section is to summarize existing information and regulations regarding air, water, and land impacts in Monmouth. Where applicable, this section includes agency database information regarding permits in the Monmouth area.

Air Quality

Ambient air quality is monitored by the Oregon Department of Environmental Quality (DEQ) by a statewide air quality surveillance network. Ambient air quality is related to the amount and types of discharged pollutants and meteorological events. Air Pollution Index (API) values, based on the monitoring information, and are calculated for Portland, Salem, Eugene, Medford, and Bend. The monitoring stations closest to Monmouth are located in Salem. These stations continuously monitor for carbon monoxide, ozone, sulfur dioxide, and nitrogen dioxide and particulate levels. Lead samples have also been obtained in Salem.

The air pollutants of greatest concern in Oregon are:

- ground-level ozone, commonly known as smog
- fine particulate matter (mostly from wood smoke, other combustion sources, cars and dust) known as PM2.5 (2.5 micrometers and smaller diameter)
- hazardous air pollutants (also called Air Toxics)

The *2008 Oregon Air Quality Annual Report* produced by DEQ shows that Salem had 327 days rated as Good for air quality and 32 days rated as Moderate. Six (6) days were rated as "unhealthy for sensitive groups" such as people with heart disease, respiratory disease (such as asthma), older adults, and children. No days were rated "Unhealthy".

Air pollution permits include Air Contaminant Discharge Permits and Oregon Title V Operating Permits, and are dependent on:

- The type of facility proposed
- The amount of emissions
- The type of emissions
- Regional air quality e.g. is the area in "attainment" of existing air quality standards (DEQ, 1996).

Activities that typically require a permit include asphalt plants, incinerators, grain elevators, rock crushers, boilers, and other major sources of air pollution. In general, facilities that emit more than 10 ton of pollutants per year require a permit and facilities that emit more than 100 ton of pollutants per year require a permit and must meet standards that are more stringent. DEQ should be contacted for more information and assistance regarding air contaminant discharge permits.

In 2008, the Environmental Quality Commission approved Greenhouse Gas (GHG) mandatory reporting rules. The rules are needed to gain a better understanding of the sources of greenhouse gas emissions in Oregon, and to track progress toward meeting GHG emission reduction goals.

Beginning in 2009, some types of permitted facilities must report emissions for the calendar year These include uses permitted by Oregon Title V Operating Permits and some uses permitted by Air Contaminant Discharge Permits. The facilities required to report must emit 2,500 metric tons of combined greenhouse gases measured as CO2 equivalents (mtCO2e) per year.

The DEQ maintains a database of Air Contaminant Discharge Permits. Facilities that emit over certain levels of particulates, carbon monoxides, nitrogen oxides, sulfur dioxide, or volatile organic compounds are required to obtain a discharge permit. The DEQ database does not list any Air Contaminant Discharge Permits in Monmouth.

Other local air quality concerns can include asbestos; outdoor burning, dust and fugitive emissions, chlorofluorocarbons, and wood stove pollution. These activities are regulated as follows:

- Demolition, renovation, repair, construction, or maintenance activities that involve material containing asbestos are regulated by DEQ.
- Construction of large parking lots (150 to >1000 spaces) in certain areas of the state requires a permit.
- Most western Oregon counties (including Polk County) require that certain activities take precautions to prevent particulate matter (dust and fugitive emissions) from becoming airborne. Construction and renovation activities, equipment operation, and materials handling are examples of potentially affected activities.
- DEQ, and other state agencies, regulate all types of outdoor burning (e.g. backyard incinerators, construction debris, and field burning) some local governments have added additional restrictions by local ordinances.
- Controlling wood smoke pollution from wood stoves may be mandatory or voluntary, depending on regional air quality.
- The service, maintenance, repair, installation, and disposal of air conditioners and refrigerators are strictly regulated. The chlorofluorocarbons used in these units interact with the atmosphere, create smog, and damage the ozone layer.

Air toxics are generally defined as air pollutants known or suspected to cause serious health problems. Serious health effects include cancer, birth defects, lung damage, and nerve damage. The U.S. Environmental Protection Agency (EPA) has recently released the first of two phases of the National Air Toxics Assessment (NATA), a new evaluation of 32 high priority toxic air pollutants. The first phase of NATA includes estimated air toxics emissions and outdoor concentrations. The second phase will provide estimates of exposure and health risk. In the Willamette Valley, there are concentrations of 12

toxic air pollutants estimated to exceed health-based benchmarks, or guidelines for safe levels. These pollutants are acetaldehyde, acrolein, benzene, beryllium, 1,3butadiene, carbon tetrachloride, chloroform, chromium, 1, 3 dichloropropene, ethylenedibromide, ethylene dichloride and formaldehyde. Five of those air pollutants are present in concentrations estimated at ten times or more above benchmarks. Major sources are large industrial facilities, like wood products manufacturers and steel mills. Area sources include smaller manufacturers and service industries, such as auto body shops and service stations, and consumer activities. On-road mobile sources are cars and trucks. Non-road mobile sources include motorized watercraft, farm equipment, and all terrain vehicles.

Because motor vehicles emit the most air toxics, people can help by driving less (reducing trips using public transportation, carpooling and telecommuting). Using alternatives to gas powered equipment, such as electric lawnmowers and weed trimmers will also reduce air toxics. As consumers, we can choose products that emit fewer volatile organic compounds, which are usually air toxics as well. Many paints and other products are now available in low toxicity formulations. Other ways of reducing air toxics include reducing woodstove use, doing regular vehicle maintenance and avoiding household pesticide use.

Air quality in the Willamette Valley is affected by all activities occurring in the airshed. The metropolitan areas influence air quality in the rural areas and vice versa. While large point sources are most often associated with air quality problems it is important not to underestimate the cumulative impact of individuals operating small engines, driving vehicles, and backyard burning. To reduce pollutants related to burning, Monmouth enacted a citywide ban on outdoor burning in 2010.

Water Quality

Information about surface and groundwater quality in the Monmouth area was obtained from the DEQ, Oregon Health Division (OHD), and other background reports. This information is compiled from monitoring programs run by state agencies to comply with water quality standards set by the U.S. Environmental Protection Agency. Water quality investigations have been undertaken for the Willamette Basin by the United State Geological Survey for surface water and groundwater.

Surface Water Quality

The Clean Water Act (CWA) requires that states publish a list of surface water bodies that fail to meet water quality standards. Water bodies that do not meet water quality standards are assessed as Water Quality Limited and are assigned to categories depending on the type of pollutant(s) present and the plans for restoring the water quality. The Section 303(d) list includes waters where pollutant Total Maximum Daily Loads (TMDLs) need to be developed. Plans to improve water quality must be developed when a water body is placed on the 303(d) list.

Every two years, DEQ assesses water quality and reports to Environmental Protection Agency (EPA) on the condition of Oregon's waters. DEQ completed Oregon's 2004/2006 Integrated report in May 2006. Oregon's 2004/2006 303(d) list was reviewed and approved by EPA in February 2007. DEQ is currently working on Oregon's 2010 Integrated Report, which will update Oregon's 303(d) list of water quality limited waters needing TMDLs. The report is due to be submitted to EPA in late 2010.

Ash Creek is not included in the Section 303(d) list. The South Fork of Ash Creek is listed on the DEQ Water Quality Assessment Database as attaining water quality standards. The North Fork of Ash Creek is listed by DEQ as "water quality limited not needing a TMDL". The listing is based on stream flows and habitat modification. Low stream flow is not considered a pollutant. Habitat modification can include modifications produced by increased stormflows (siltation, bank destabilization, etc.) and out-of-stream

habitat alterations (riparian vegetation removal, bank alteration, etc.), and stream encroachments (dams, enclosures, bridges, etc.). Because flow and habitat are not considered pollutants under the Clean Water Act, the North Fork of Ash Creek is not included in the 303(d) List. In Monmouth, most of the North Fork of Ash Creek extends across areas that are undeveloped, extending approximately 5,500 feet from 16th Street northward to Hoffman Road. Most of this area is located in the Urban Growth Boundary, but outside the City Limits.

The Oregon DEQ administers the water quality permit process. National Pollutant Discharge Elimination System (NPDES) permits regulate discharges to surface waters from commercial or industrial facilities, municipal sewage treatment plants, confined animal feeding operations with point source discharges, and mining operations. Water Pollution Control Facility (WPCF) permits regulate discharges of waste waters land to the land surface or subsurface with no direct discharge to surface waters. Examples include land irrigation, evapotranspiration lagoons, industrial seepage pits, and subsurface sewage disposal systems with flows greater than 2,500 gallons per day.

Stormwater runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during rainfall and snow events often contain pollutants that could adversely affect water quality. National Pollutant Discharge Elimination System (NPDES) permits are required for storm water discharges to surface waters from construction and industrial activities and municipalities if stormwater from rain or snow melt leaves a site through a "point source" and reaches surface waters either directly or through storm drainage. A point source is a natural or human-made conveyance of water through such things as pipes, culverts, ditches, catch basins, or any other type of channel.

Construction or development activities requiring an NPDES 1200-C stormwater general permit include clearing, grading, and excavation operations that disturb one acre or more of land.

Based on federal regulations, NPDES permits coverage is required for industrial facilities that discharge stormwater from their industrial areas to surface waters of the state, or to storm drains that discharge to surface waters.

Municipal sources that need to obtain permits are classified as either "Phase I" or "Phase II" municipal separate storm sewer systems (MS4s). Phase I MS4s are those with populations greater than 100,000, while regulated Phase II (or "small") MS4s are those municipalities with populations less than 100,000 located within Census Bureau-defined Urbanized Areas.

The City of Monmouth owns and operates its own wastewater collection and treatment system. The collection system transports sanitary sewage to the wastewater treatment plant located in the northeast part of the city. After treatment, the wastewater effluent is discharged to the Willamette River via gravity pipeline shared with the City of Independence. Treated effluent is discharged into the Willamette River during the wet season. The city's National Pollutant Discharge Elimination System (NPDES) Permit only allows effluent discharge from November 1 to May 31. During the dry-weather months, effluent is applied to an effluent re-use site consisting of 164 acres of trees. Evaporation also provides for some effluent disposal during summer months. Additional information regarding the City's wastewater treatment system is found in the Public Facilities Element of the Comprehensive Plan.

Groundwater Quality

Monmouth relies exclusively on groundwater for municipal water supply. Drinking water is provided by three city wells. The city's future water supplies will be derived primarily from Marion County Well #1 and a second well in Marion County (Marion County #2) that serves as a supplementary and backup source to Marion County Well #1. Marion County Well #2 began operating in 2009. The City of

Monmouth is also pursuing the development of a shallow well field on the west side of the Willamette River. This project is a joint developmental project with the City of Independence referred to as the Willamette River Well Field.

The city currently has access to four (4) wells from two (3) well fields: the Marion County Well #1, located at the approach ramp at the east end of the Willamette River (Independence) Bridge, Marion County Well #2, located south of Well #1 on Riverside Road, and the Independence Fourth Street well field. The Marion County well is an 1100-1200 GPM production source. The Independence Fourth Street Well field consists of two (2) separate wells with a combined capacity of approximately 350-400 GPM. Total current maximum production from all sources is 1500 GPM (2.16 MGD).

All of the current drinking water treatment facilities are located at the Marion County Well #1. The city operates an air stripping facility (installed in 1994-1995) at the Marion County Well site for removal of Carbon Dioxide gas. The water pH is elevated from a level of 5.5-6 to 7.0-7.5 following this procedure. Additional control for pipeline corrosion is obtained through the injection of zinc orthophosphate ($ZnPO_4$). Chlorination is performed using gaseous chlorine at the Marion County well. Sodium Fluoride is also introduced into the water at Well #1.

The 2000 Water System Master Plan notes that since the City of Monmouth uses groundwater exclusively, modifications to the Safe Water Drinking Act (SWDA) that affect surface water supplies have little or no impact to Monmouth. Recent water quality regulations enacted since 2000 that pertain to the City of Monmouth's water supply include new regulations for ground water and arsenic. Since Monmouth routinely chlorinates water delivered to customers, these new regulations do not represent a substantial concern to the city. The greatest water quality concerns for Monmouth include control of nitrates at the Marion County wells, and monitoring of synthetic organics at the Fourth Street field. Future water quality concerns affecting the City of Monmouth include continued monitoring of synthetic and volatile organic contaminants at all wells, nitrate monitoring at the Marion County wells, coliform bacteria monitoring at all wells, and possible surface water influence at the Willamette River Well Field and/or Marion County #2.

Source Water Assessment Plan

In 2005, the Oregon Department of Human Services, Health Services - Drinking Water Program and the Oregon Department of Environmental Quality, Water Quality Division - Drinking Water Protection completed a Source Water Assessment Report for Monmouth. The Source Water Assessment Program, mandated by the Safe Drinking Water Act, requires that states provide the information needed by public water systems to develop drinking water protection plans if they choose. That information includes the identification of the area most critical to maintaining safe drinking water, i.e., the Drinking Water Protection Area, an inventory of potential sources of contamination within the Drinking Water Protection Area, and an assessment of the relative threat that these potential sources pose to the water system.

The report assessed City Well #1 located in Marion County and Well #5 located in Independence. Assessment results indicate that Well #1 and Well #5 would be highly sensitive to a contamination event inside the identified Drinking Water Protection Area. The presence of several high-risk and moderate-risk potential contaminant sources within the protection area was confirmed through a potential contaminant source inventory. Under a "worst case" scenario, where it is assumed that nothing is being done to protect groundwater quality at the identified potential contaminant sources, the assessment results indicate that the water supply in these wells would be highly susceptible to a few of the potential contaminant sources. The analysis also found nitrates and naturally occurring selenium in these wells.

The assessment results also indicate that, at this time, the Well #1 aquifer is considered susceptible to viral contamination due to the presence of septic systems in the area..

The potential contaminant sources are listed in the table below.

Air, Water, and Land Resources, Quality Element - Table 1
Potential Contaminant Sources within each Two-year Time-of-Travel Zone
City Well #1 and Well #5

Well Number	Potential Contaminant Sources within each Two-year Time-of-Travel Zone
Well #1 (Marion County Well)	Rural homesteads with septic systems, above ground storage tanks, irrigated crops, a gravel pit, South River Road, and two possible pesticide/fertilizer handling/storage areas.
Well # 5	Irrigated crops, non-irrigated crops, and a railroad transportation corridor.

Source: Water Assessment Report for Monmouth, 2005

The report states that: "It is important to remember the sites and areas identified are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly."

The City currently takes several steps to reduce risks from contamination and ensure a safe drinking water supply. The City blends water from several wells to reduce nitrate and selenium concentrations. Even without blending, the amounts of chemicals in the water supply do not exceed acceptable levels.

The City is currently developing a new wellfield as a joint project with the City of Independence and will be constructing a new 1,000,000-gallon storage reservoir. The increased capacity will facilitate blending from various well sources as a means of reducing nitrate levels. The City also has the ability to perform continuous testing and treatment drinking water as necessary. The treatment facility at the new wellfield will also have the capacity to accommodate nitrate filters if required in the future.

The City also provides a minimum sanitary protective radius of 100 feet or 200 feet diameter for each well. For new municipal wells being developed in Independence, the City is establishing a minimum protective area of one (1) acre square established for each well, with the well established as the center of the acre.

Once the City has established additional capacity with planned system improvements a Wellhead Protection Plan can be developed. Wellhead protection is a plan designed to protect groundwater resources of public water systems. These plans include the determination of the area around the well most susceptible to contamination, the inventory of potential contaminant sources within that area, and the implementation of management strategies to reduce the risk associated with those sources.

Storm Drainage System

The City of Monmouth is generally divided into two drainage basins. The first is located to the extreme west and flows north and northeast to and through the university grounds to the swale that eventually empties into the North and Middle Forks of Ash Creek. The North and Middle Forks of Ash Creek above Gun Club Road in Independence drain some 13,400 acres, or about 21 square miles. The second drainage course runs through the south and southeast quarter of the city generally flowing due east to the city limits and eventually discharging into the South Fork of Ash Creek as it enters the City of Independence. The South Fork carries smaller flows with a drainage area of 4,300 acres (6.7 square miles) above Helmick Road.

Within the City, the storm drain collection system is generally made up of small (less than 36-inch diameter) pipelines, catch basins and open drainage ditches. Present drainage problems include minor flooding during very heavy rainfall due to undersized piping and lack of storm improvements. The northwest part of town receives heavy sheet flow from the adjacent hillside. A formal storm system is needed to mitigate the minor flooding that occurs below the hill. New developments are required to provide storm drainage system compatible with the city system by detaining the storm water and releasing it at pre-development rates.

The DEQ has established Total Maximum Daily Load (TMDL) standards for water bodies located within the Willamette River basin. TMDLs limit the total amount of specific pollutants that may be discharged into a given water body. In 2008, the City of Monmouth developed a Stormwater TMDL Implementation Plan for Ash Creek. The City's stormwater system drains to the three forks of Ash Creek. The Implementation Plan includes action items to aid in decreasing water temperature, reducing bacteria, and reducing mercury discharge.

Land Quality

Land quality is protected in Oregon by regulation of hazardous waste and waste tire storage and transfer; and regulation of underground storage tanks and solid waste. Land quality can ultimately affect water and air quality.

Hazardous waste permits are required for activities that:

- Generate useless, unwanted or discarded pesticide or manufacturing residue that is toxic, corrosive, ignitable, or reactive, and
- Establish a hazardous waste disposal site.

Hazardous waste permits may be required for activities that:

- Generate hazardous waste and store it on site for more than 90 days, and
- Store and/or treat hazardous waste on site.

Western Oregon University is the only registered hazardous waste generator in Monmouth.

Oregon's Underground Storage Tank (UST) Program is part of DEQ's Land Quality Division. The UST Program handles issues related to tank registration and operating certificates; installation, operation and removal of USTs; cleanup of soil and groundwater contamination from petroleum leaks; training of system operators; financial liability protection for future leaks, contractors working on USTs and enforcement of state and federal UST rules.

Permits are required for underground storage tanks that:

- Contain petroleum products or listed chemical products such as gasoline, diesel, solvents, pesticides, and herbicides, and
- Are larger than 1,100 gallons, and
- Have more than 10% of the total volume (including piping) underground.

Underground storage tanks that are unused for a period of 12 months must be permanently decommissioned by either removing the tank or filling it with an inert substance. DEQ must be notified prior to activity, and a report and checklist must be submitted after the work is completed. The activity must be performed by a licensed service provider. Plans to treat petroleum contaminated soils from an

underground storage tank release, on or off the site, will require a Solid Waste Letter of Authorization from DEQ and submitted with a Soil Treatment Plan.

Table 2 shows the DEQ database information regarding underground storage tanks in Monmouth, including decommissioned tanks. Active tanks in Monmouth are located at service stations at the intersection of Main Street and Highway 99W (Pacific Highway N.).

Air, Water, and Land Resources, Quality Element - Table 2
DEQ Underground Storage Tanks in the Monmouth Area

ID #	Facility	Location	Total Tanks	Active Tanks	Decommissioned Tanks	Permitted Tanks
826	Boise Cascade Region Office	450 Pacific Highway N.	1		1	
8392	Brandt's Sanitary Service	158 Pacific Highway S.	5		5	
762	Chevron USA #99035	113 Pacific Highway N.	8		8	
5539	Main Street Pizza	180 Main Street E.	5		4	1
11001	Marr Brothers	779 Church Street W.	1		1	
972	Pacific Highway Auto Care LLC	112 Pacific Highway N.	8	3	5	3
144	Shell - 507	595 Main Street E.	7	2	5	2
9089	Topa Mobil	350 Pacific Highway N.	4		4	
5310	Well #1 – Wastewater Treatment Plant	450 Hogan Road	5		5	
1992	Western Oregon University	Physical plant	4		4	

Source: Oregon DEQ, 2010

Oregon's Leaking Underground Storage Tank (LUST) Program is part of the DEQ's Land Quality Division. The LUST Program handles issues related to cleanup of soil and groundwater contamination from spills and releases from regulated underground storage tanks (USTs), contractors working on cleanup of soil and groundwater contamination at LUST sites and enforcement of state and federal rules.

DEQ databases indicated permits for leaking underground storage tanks in the Monmouth area. DEQ records identify leaking underground storage tank sites that have since been cleared of contamination. Table 3 shows information from the DEQ database for Monmouth. The database includes 16 leaking underground storage tank sites in Monmouth, four (4) sites of which did not include a cleanup end date. The below information should be considered minimum numbers since not all tanks are permitted and not all old tank locations are known.

Air, Water, and Land Resources, Quality Element - Table 3
DEQ Leaking Underground Storage Tanks in the Monmouth Area

Log #	Site Name	Location	Release Stopped	Cleanup Start	Cleanup End
27-84-4009	Bisland Mobil Oil	615 Main Street E.	02/09/1984	12/30/1987	N/A
27-91-4362	Brandt's Sanitary Service	158 Pacific Highway S.	11/25/1991	03/03/1992	N/A
27-94-4180	Heating Oil Tank	760 Main Street W.	10/24/1994	10/24/1994	08/09/1995
27-99-4069	Heating Oil Tank	684 Main Street W.	05/18/1999	05/18/1999	11/04/1999
27-01-6836	Heating Oil Tank	322 Marr Court	09/04/2001	08/18/2001	10/12/2001
27-95-5097	Heating Oil Tank	480 Boyd Lane	04/08/2002	03/06/1995	05/20/2002
27-97-4068	Heating Oil Tank	358 High Street N.	04/29/1997	04/29/1997	03/17/2000
27-98-4066	Heating Oil Tank	375 Craven Street N.	06/05/1998	06/05/1998	09/22/1998
27-90-4041	Chevron 9035	113 Pacific Street N.	10/24/1989	10/24/1989	12/02/1998
27-92-4164	City of Monmouth	401 Hogan Road	09/04/1992	09/04/1992	09/16/2002
27-07-1666	Conoco-Phillips 253975	112 Pacific Highway N.	N/A	N/A	N/A
27-96-4004	Main Street Pizza	180 Main Street E.	01/12/1996	01/12/1996	N/A
27-90-4172	Monmouth Shell Service	595 Main Street E.	04/01/1995	03/08/1992	04/11/2002
27-91-4134	WOSC	345 Monmouth Avenue N.	05/07/1991	05/07/1991	06/20/2006
27-05-2016	WOU	345 Monmouth Avenue N.	08/23/2005	09/19/2005	11/04/2005
27-89-4192	UNOCAL	112 Pacific Highway N.	10/31/1989	10/31/1989	09/29/2005

Source: Oregon DEQ, 2010

The Main Street Pizza site is located at the corner of Main and Knox streets adjacent to Main Street Park. The City's Park Master Plan includes eventually incorporating the property as park of Main Street Park. A gas station was formally located on the property and numerous contaminants have been identified .

An initial cleanup of the property in 2008 included excavation and landfill disposal of over 1,100 tons of petroleum contaminated soil and removal of more then 3,000 gallons of water from the hand-dug well on the property. Oregon DEQ has identified a number of issues that will need to be resolved before the site cleanup phase is complete or compliance monitoring could be performed. These include assessment of off-site contamination impacts to nearby utility trenches and further assessment of the soil and deeper groundwater conditions in the vicinity of the former hand-dug well.

Solid Waste

The City of Monmouth does not have a solid waste disposal facility. Local collection is handled by contract with Brandt's Sanitary or by individuals hauling their own waste. The company disposes waste at the Coffin Butte landfill near Corvallis. The Benton County Comprehensive Plan states that the landfill has approximately 40 years of additional capacity. Curbside recycling is available to citizens in the community. In 2009, curbside pickup was expanded to include yard debris.

The City's regional contact is through the Polk County Community Development Department, which administers a solid waste collection franchise ordinance. The Community Development Department also coordinates recycling, and household hazardous waste collection programs.

It is important that the City participate in a regional solid waste management program. A regional solid waste management program strives to maximize the use of existing sites, endorse energy conservation and recycling of wastes, and coordinates solid waste activities of counties in the region. The City of Monmouth supports a regional solid waste management program that includes recycling opportunities.

Air, Land, and Water Resources Goals and Policies

GOAL: To maintain and improve the quality of air, water, and land resources in Monmouth.

Policies:

- All development and activities within the city shall adhere to applicable federal, state, and local air, water, and land quality regulations and standards.
- In cooperation with appropriate agencies, Monmouth shall manage its air, water and land resources to ensure their protection, conservation, restoration, or enhancement.
- Monmouth shall use "best management practices" for air, land, and water resources in all City operations and capital projects.
- Monmouth will contribute to, or comment upon, regional water quality improvement planning and fish recovery plans undertaken by state and federal agencies by reviewing and responding to proposed policies and plans.
- Monmouth will promote solid waste recycling, reuse and disposal options by providing for the licensing and permitting of persons engaged in these activities as part of franchise agreements.
- As water system capacity is increased, Monmouth will protect significant groundwater resources by developing a wellhead protection plan.
- Monmouth will continue to implement the Stormwater TMDL Implementation Plan for Ash Creek.
- Monmouth will continue to support the regional solid waste management program.

Exhibit B

Chapter XXX
Natural Hazards

Introduction

Oregon's statewide planning goals and guidelines include Goal 7: Areas Subject to Natural Hazards. The purpose of this goal is to protect life and property from natural disasters and hazards. This goal is accomplished by identifying and inventorying the types of potential natural disasters and hazards that might affect the community. Inventory information is the basis of subsequent planning and implementation activities.

In May 2009, Polk County adopted a Multi-Jurisdictional Hazard Mitigation Plan Update. This plan includes appendices for each city in the County describing possible natural hazards, the risk to critical facilities, and planned mitigation actions. Hazard mitigation is work done to minimize the impacts of any type of hazard event before it occurs. Mitigation actions include public education and outreach, programs, projects, and policy actions intended to minimize damage from natural hazards.

The purpose of this section is to identify the types of natural hazards within the Monmouth urban area and describe the community's hazard mitigation activities. The descriptions of natural hazards, which could impact Monmouth and the associated mitigation actions considered, are taken from the Polk County Multi-Jurisdictional Hazard Mitigation Plan Update, which was adopted by the City of Monmouth in 2009.

Floods

A flood is the temporary inundation of water or mud on normally dry land. Heavy or prolonged rain, snowmelt, or dam collapse can cause inundation, as can riverine and flash floods. (NOAA 2008) Urban and riverine flooding primarily affect Polk County.

Urban flooding occurs in developed areas where the amount of water generated from rainfall and runoff exceeds the stormwater systems' capacity. As land is converted from agricultural and forest to urban uses, it often loses its ability to adsorb rainfall. Rain flows over impervious surfaces such as concrete and asphalt and into nearby storm sewers and streams. This runoff can result in the rapid rise of floodwaters. During urban floods, streets can become inundated, and basements can fill with water. Storm drains often back up because of the volume of water and become blocked by vegetative debris like yard waste, which can cause additional flooding. Development in the floodplain can raise the base flood elevation and cause floodwaters to expand past their historic floodplains. (FEMA 2008c)

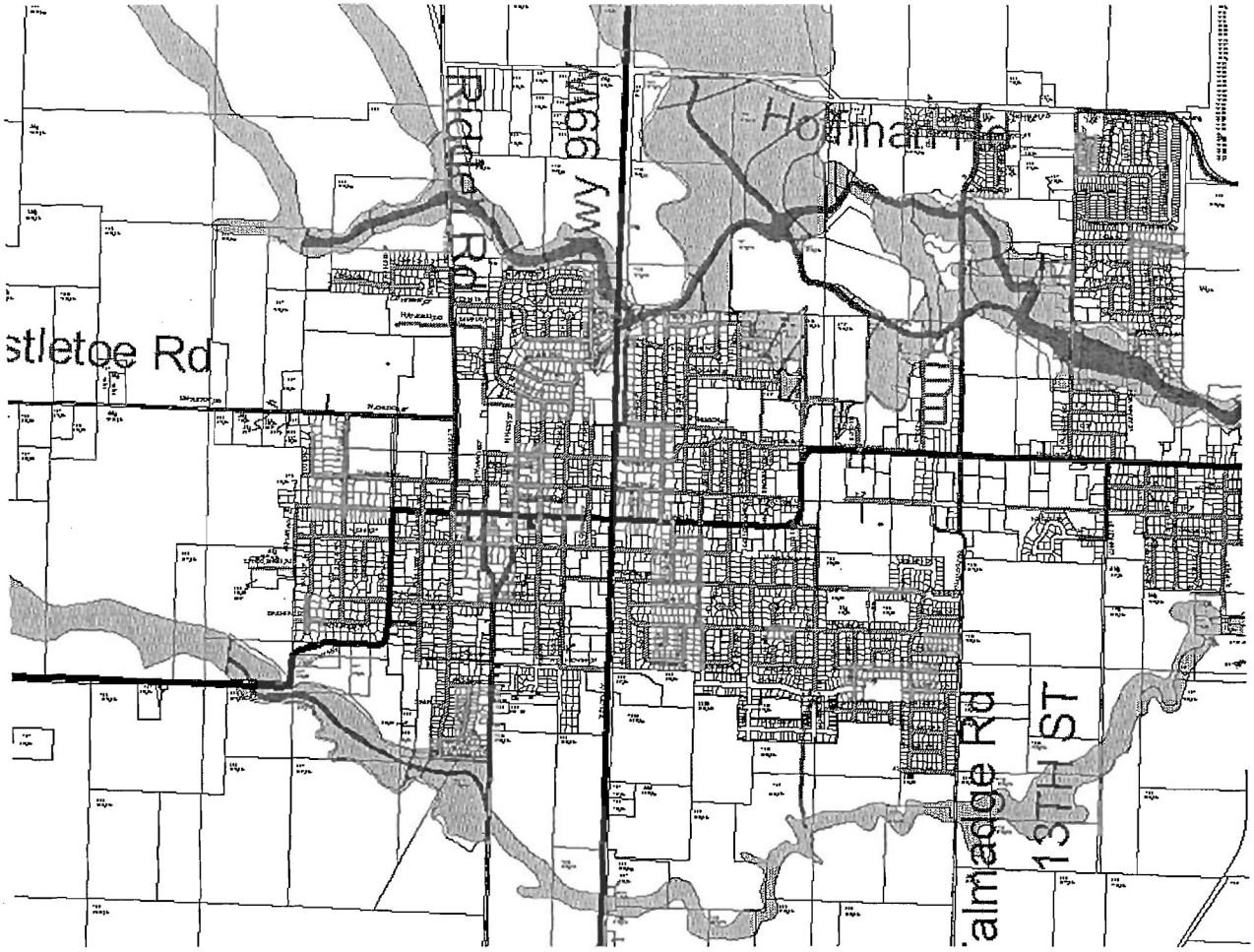
Riverine or overbank flooding of rivers and streams is the most common type of flood hazard. Riverine flooding most frequently occurs in winter and late spring. Air rises and cools over the Coast Range and its foothills and heavy rainfall develops over high-elevation streams, as storms move from the Pacific across the Oregon Coast. In this region, as much as four to six inches of rain can fall over a 24-hour period. Severe and prolonged storms can raise rivers and streams to their flood stages for three to four days or longer. (State of Oregon 2008)

The Federal Emergency Management Agency (FEMA) has mapped most of the flood-prone streams in Oregon for 100- and 500-year flood events. A 100-year flood (one percent occurrence probability of

occurring within any given year) is used as the standard for floodplain management in the United States and is referred to as a base flood. Flood Insurance Rate Maps (FIRMS) prepared by FEMA provide the most readily available source of information for 100-year floods. FEMA released a new Flood Insurance Rate Map (FIRM) for Monmouth on December 19, 2006.

Flooding in Monmouth is associated with Ash Creek. An area totaling approximately 73 acres within the Monmouth urban area are located within the 100-year floodplain of Ash Creek. The 100-year floodplain for Ash Creek as mapped by FEMA is shown in Figure 1.

Figure 1
Ash Creek 100-Year Floodplain



Winter Storms

Winter storms occurring in Polk County result in several natural hazards— including floods, landslides/debris flows, ice formations, snow, and wind. Each on its own, or in combination, can completely immobilize emergency response activities, close down transportation corridors, and disrupt transportation and utilities. Winter storms in Polk County can bring rain as well as snow, or can be followed by rising temperatures that melt newly fallen snow. Either scenario often causes flooding; most floods in western Oregon occur as a result of winter storms.

Ice and snow storms, which can include freezing rain, sleet, and hail, can be the most devastating of winter weather phenomena and are often the cause of automobile accidents, power outages and personal injury. Ice storms result in the accumulation of ice from freezing rain, which coats every surface, it falls on with a glaze of ice. Freezing rain is most commonly found in a narrow band on the cold side of a warm front, where surface temperatures are at or just below freezing. Typically, ice crystals high in the atmosphere grow by collecting water vapor molecules, which are sometimes supplied by evaporating cloud droplets. As the ice crystals fall, the air warms and the particles melt and collapse into raindrops. As the raindrops approach the ground, they encounter a layer of cold air and cool to temperatures below freezing. However, since the cold layer is shallow, the drops themselves do not freeze, but rather are supercooled, that is cooled in a liquid state to below-freezing temperatures. These supercooled raindrops freeze on contact when they strike the ground or other cold surfaces.

Snowstorms happen when a mass of very cold air collides with a mass of warm air. The warm air rises quickly and the cold air cuts underneath it, cooling and condensing as it rises, forming a cloudbank in the process. As the moisture droplets in the cloud cool to a point below freezing, they become ice crystals, which then collide within the cloud and snow is formed. Similar to those of ice storms, the effects of a snowstorm can disturb a community for weeks or even months. The combination of heavy snowfall, high winds and cold temperatures poses danger from prolonged power outages, automobile accidents and transportation delays, dangerous walkways, and through direct damage to buildings, pipes, crops, other vegetation, and livestock. Buildings and trees can also collapse under the weight of heavy snow.

Drought

Drought is variously defined as a period of abnormally dry weather creating hydrologic imbalance, shortage of precipitation adversely affecting crops, or a period of below average water in streams and lakes, reservoirs, aquifers, and soils. (USGS 2008) There is no universal measure of precipitation or dryness that signifies drought. Historically, droughts have been seen as unpredictable and unavoidable events. Climate fluctuations occur everywhere, and periods of low precipitation are a normal, recurrent feature of climate.

Drought is commonly referenced in terms of its effects on agriculture, with crop damage or failure used to measure its effects. Other direct environmental effects of drought include livestock death or decreased production, wildland fire, impaired productivity of forest land, damage to fish habitat, loss of wetlands, and air quality effects. Indirect effects to society are measured by the economic and physical hardships brought on by drought and by the increased stress on residents of a drought-stricken area. (ONHW 2004)

El Niño/Southern Oscillation

El Niño/Southern Oscillation weather patterns portray periodic warming and cooling of the central Pacific Ocean. This warming and cooling cycle has global implications as normal weather patterns are altered over vast areas of the world, causing changes in temperature and precipitation from Chile to Indonesia to the Pacific Northwest.

During El Niño periods, alterations in atmospheric pressure in equatorial regions yield an increase in the surface temperature off the west coast of South America. This gradual warming sets off a chain reaction affecting major air and water currents throughout the Pacific Ocean. In the North Pacific, the Jet Stream is pushed north, carrying moisture laden air up and away from its normal landfall along the Pacific Northwest coast. In Oregon, this shift results in reduced precipitation and warmer temperatures, normally experienced several months after the initial onset of the El Niño. (Taylor 2008) These periods tend to last

nine to twelve months, after which surface temperatures begin to trend back towards the long-term average.

La Niña periods ensue when surface temperatures increase past the long-term average. Typical weather patterns throughout the Pacific Ocean are strengthened, yielding stormier than normal weather throughout the Pacific Northwest. Above average precipitation and colder temperatures are experienced across Oregon during these periods, with the potential for severe snow storms increasing. (Taylor 2008) These periods generally last longer than El Niño events, taking anywhere from one to three years to dissipate.

Both El Niño and La Niña periods tend to develop between March and June, and peak from December to April. (NOAA 2005)

Wildland Fire

Wildfires can be classified as wildland, wildland/urban interface, intermix, urban, and prescribed fires. Both wildland and wildland/urban interface fires are significant hazards due to the large amount of forested land in Polk County.

Wildland fires spread through the consumption of vegetation. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may be visible for miles around. Wildland fires can be caused by human activities such as arson or campfires, or by natural events like lightning. Wildland fires often occur in forests or other areas with ample vegetation. When a wildland fire spreads to developed areas such as suburbs, small communities, or isolated homes, it becomes a wildland/urban interface fire.

In Oregon, wildland fire season normally begins in late June, peaks in August, and ends in October. However, a combination of above normal-temperatures and drought can increase the length of the traditional fire season. Over 70% are human caused, while 30% occur from lightning strikes. Wildland fire hazards in Polk County would be highest during prolonged drought periods, especially after periods of below normal rainfall, which would result in a combination of high fuel loads and unusually dry conditions.

The probability of a wildland fire occurring in the county is moderate according to historical fire patterns in Polk County with a one in 35-75 year recurrence interval. Although the county has not experienced many major fires like those that have affected other counties in Oregon, there is a significant possibility that a major wildland or wildland/urban interface fire could occur in the future.

Earthquakes

An earthquake is a sudden motion or trembling of the earth produced by the rupture of rock formations due to stresses beyond the rocks' elastic limits. The point inside the Earth where the rupture takes place is termed the hypocenter. The point on the planet's surface directly above the hypocenter is the epicenter. The effects of an earthquake can be felt far beyond the occurrence site. Earthquakes usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

Monmouth is located within the geographical area bordering the Cascadia Subduction Zone. This zone is comprised of an 800-mile sloping fault and several smaller inland and offshore faults extending from

British Columbia to the north and Northern California to the south. The fault system separates the Juan de Fuca and North American plates.

Hazard Shake Maps produced by the United States Geological Survey (USGS) consider two alternative scenarios for damaging earthquakes (M 8.3 or M 9.0) along the subduction zone. The shake maps show the ground motion level that has one (1) chance in 475 of being exceeded each year, which is equal to a 10 percent probability of being exceeded in 50 years. Polk County falls within the strong to very strong shaking range. All of Polk County is subject to earthquakes. However, the western portion of the county is more likely to be affected by a major quake, because of its closer proximity to the Cascadia Subduction Zone.

Wind

Wind is air flow that travels horizontally with respect to the Earth's surface and topography. High winds are defined as those that last longer than one hour at greater than 39 miles per hour (mph) or for any length of time at greater than 57 mph. Wind speeds vary with individual storms. Windstorms often accompany snow, ice, and extreme cold temperature events during winter storms. In general, the damaging effects of windstorms may extend for distances of 100 to 300 miles from the center of storm activity.

The Willamette Valley is somewhat sheltered from strong westerly winds, as the north-south orientation of the Coast Range and Cascades obstructs and slows these surface winds. However, winds blowing along a north to south axis (parallel to the major mountain ranges) can be destructive. Regardless of wind direction, these prolonged windstorms are likely to last an average of three to six hours before moving on.

High winds are likely to occur during the months of October through April. Destructive windstorms are less frequent, but recent research has revealed a connection between the neutral years of the El Niño Southern Oscillation conditions and major Pacific Northwest windstorms. Generally, windstorms have a short duration and winds move in a straight line with gust exceeding 50 mph. (ONHW 2006)

Erosion

Erosion is a process that involves the gradual wearing away, transport, and movement of land. However, not all erosion is gradual. It can occur quite quickly as the result of a flash flood, coastal storm, or other event. Most of the geomorphic change that occurs in a river system is in response to a peak flow event. It is a natural process but its effects can be exacerbated by human activity.

Generally erosion occurs when the flow of the river changes and is directed towards the banks or mid-channel islands. These changes can be caused by surface wind stress and gravity waves that occur during storm events (primarily severe winter storms), transporting sediment by bottom currents. (Sternberg 1986)

Erosion loss has historically occurred in Polk County. Rivers and creeks that have been identified to be subject to the effects of erosion include Ash Creek. The annual amounts of rain and wind that assail the shoreline combined with debris flows within the watersheds and loss of plant cover in riparian areas induce erosion, particularly during severe storm events.

Expansive Soils

The addition of moisture to any soil will cause a change in volume, which is referred to as a shrink-swell characteristic. (USDA NRCS 2008) Expansive soils are typically comprised of clay minerals that under some conditions are capable of increasing in volume when moisture is added.

In 1982, expansive soils were documented as the most costly natural hazard in the US, causing more damage than all other natural hazards combined, including earthquakes, floods, tornadoes, and hurricanes.

Soil expansion may be caused by changes in soil moisture, variations in thickness and composition of the expansive foundation soil, non-uniform structural loads, and the geometry of the structure. (US Army 1983) Potential sources of moisture changes are variation in precipitation, poor gutter or water drainage, vegetation changes over time (such as root growth of nearby trees), and plumbing leaks. By affecting the relative moisture of soils underlying foundations, uneven movement such as localized heave can occur, causing shifting and non-uniform foundation movements, thus impacting the structures above.

However, many sources of soil moisture change can be avoided, minimized, or mitigated through planning and structure maintenance. Some signs of possible soil expansion include separation of joints and trim; cracks in walls, floors, or concrete; and bowed or non-vertical walls. Some possible mitigation measures are maintaining separation between structures and runoff, using compact fill to shed water, not absorb it, and planting trees a distance equal to their mature height away from buildings to reduce root interference.

Potential damages to structures from expansive soils in Polk County include: cracks in grade beams, walls, and drilled shafts; distortion and cracking of pavements and on-grade floor slabs; failure of steel or concrete blocks supporting grade beams; jammed or misaligned doors and windows; and buckling of basement and retaining walls due to lateral forces. Extensive damage can potentially result in the condemnation of structures. (US Army 1983)

As part of the Multi-Jurisdictional Hazard Mitigation Plan Update, the City of Monmouth adopted natural hazard mitigation goals as shown in Table 1.

Table 1 - City of Monmouth Natural Hazard Mitigation Goals

Goal Number	Goal Description
1	**Public Education And Awareness:** *Provide public information and education/awareness to all residents of the city concerning natural hazard areas and mitigation efforts.*
2	**Preventive And Implementation:** *Develop and implement activities to protect human life, commerce, property, and natural systems.*
3	**Collaboration And Coordination:** *Strengthen hazard mitigation by increasing collaboration and coordination among citizens, public agencies, non-profit organizations, businesses, and industry.*
4	**Funding And Partnerships:** *Seek partnerships in funding and resources for future mitigation efforts.*
5	**Emergency Operations:** *Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.*
6	**Natural Resources Utilization:** *Link land use planning, development criteria, codes, and natural resources and watershed planning with natural hazard mitigation.*

During the Multi-Jurisdictional Hazard Mitigation Plan Update process, a Steering Committee comprised of City staff, representatives from Fire District No. 1, Western Oregon University, and the Planning Commission reviewed and prioritized possible mitigation actions for each of the identified natural

hazards. The mitigation actions considered by the Steering Committee are shown in Table 2. The Steering Committee also considered mitigation actions related to disruption of utility and transport systems, which is a common result of severe natural hazards, and hazardous materials (HAZMAT) incidents.

Table 2 - City of Monmouth Natural Hazard Mitigation Actions-Considered
(Listed in order of priority by hazard)

Hazard	Status	Comment	Description
Multi-Hazard	Consider	Top Priority	Establish and maintain a formal role for the jurisdictional Hazard Mitigation Steering Committee to develop a sustainable process to implement, monitor, and evaluate citywide mitigation actions.
Multi-Hazard	Ongoing	Second Priority	Develop and incorporate city ordinances commensurate with building and fire codes to reflect survivability from wind, seismic, fire, and other hazards to ensure life safety.
Multi-Hazard	Ongoing	Third Priority	Review ordinances and develop outreach programs to assure propane tanks are properly anchored and hazardous materials are properly stored and protected from known natural hazards such as seismic or flooding events.
Multi-Hazard	Ongoing	Fourth Priority	Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption. (i.e. first responder and medical facilities, schools, correctional facilities, City Hall, and water and sewage pump stations, etc.).
Multi-Hazard	Consider	Fifth Priority	Based on known high-risk hazard areas, identify hazard-specific signage needs and purchase and install hazard warning signs near these areas to notify and educate the public of potential hazards.
Multi-Hazard	Completed		Review ordinances and develop outreach programs to assure mobile homes and manufactured buildings are protected from severe wind and flood hazards. (Anchoring, elevation, and other methods as applicable)
Multi-Hazard	Completed		Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.
Multi-Hazard	Completed		Develop and incorporate mitigation provisions and recommendations into zoning ordinances and community development processes to maintain the floodway and protect critical infrastructure and private residences from other hazard areas.
Multi-Hazard	Completed		Increase power line wire size and incorporate quick disconnects (breakaway devices) to reduce ice load and windstorm power line failure during severe wind or winter ice storm events.
Multi-Hazard	Completed		Install lightning rods and lightning grade surge protection devices on critical electronic components such as warning systems, communications equipment, and computers for critical facilities.
Multi-Hazard	Consider		Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all natural hazards.
Multi-Hazard	Completed		Explore the need for, develop, and implement hazard-zoning ordinances for high-risk hazard area land-use.
Multi-Hazard	Consider		Retrofit structures to protect them from seismic, floods, high winds, earthquakes, or other natural hazards.
Multi-Hazard	Consider		Identify and pursue funding opportunities to implement mitigation actions.
Multi-Hazard	Consider		Develop public and private sector partnerships to foster hazard mitigation activities.
Multi-Hazard	Consider		Integrate the Mitigation Plan findings into planning and regulatory documents and programs and into enhanced emergency planning.

Table 2 - City of Monmouth Natural Hazard Mitigation Actions-Considered (Listed in order of priority by hazard)

Hazard	Status	Comment	Description
Flood			
Flood	Ongoing	Top Priority	Develop, or revise, adopt, and enforce storm water ordinances and regulations to manage run-off from new development, including buffers and retention basins.
Flood	Consider	Second Priority	Develop and maintain GIS mapped inventory, and develop prioritized list of residential and commercial buildings within 100-year floodplains.
Flood	Consider	Third Priority	Develop and maintain GIS mapped critical facility inventory for all structures located within 100-year floodplains.
Flood	Ongoing		Develop an outreach program to educate public concerning NFIP participation benefits, floodplain development, land use regulation, and NFIP flood insurance availability to facilitate continued compliance with the NFIP.
Flood	Ongoing		Develop, implement, and enforce floodplain management ordinances.
Flood	Consider		Increase culvert size to increase its drainage efficiency.
Flood	Ongoing		Construct debris basins to retain debris in order to prevent downstream drainage structure clogging.
Flood	Ongoing		Install debris cribs over culvert inlets to prevent inflow of coarse bed-load and light floating debris.
Flood	Ongoing		Create detention storage basins, ponds, reservoirs etc. to allow water to temporarily accumulate to reduce pressure on culverts and low water crossings. Water ultimately returning to its watercourse at a reduced flow rate.
Flood	Ongoing		Realign bridge piers & abutments to be parallel with the stream's centerline. This prevents pier and abutment undermining and reduces debris catchment.
Flood	Ongoing		Construct concrete wing walls at culvert or bridge entrances and outlets to direct water flow into their openings.
Flood	Consider		Provide flood protection to mitigate damage and contamination of wastewater treatment systems.
Winter Storms (includes Drought & ENSO actions)			
Winter Storms	Ongoing	Top Priority	Implement and enforce the most current Uniform International, and State, Building Codes to ensure structures can withstand winter storm hazards such as high winds, rain, water, and snow.
Winter Storms	Ongoing	Second Priority	Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.
Winter Storms	Ongoing	Third Priority	Update or develop, implement, and maintain jurisdictional debris management plans.
Winter Storms	Ongoing	Fourth Priority	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.
Winter Storms	Ongoing	Fifth Priority	Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms.
Winter Storms	Ongoing		Develop and implement strategies and educational outreach programs for debris management from severe winter storms.
Winter Storms	Ongoing		Develop critical facility list needing emergency back-up power systems, prioritize, seek funding,

Table 2 - City of Monmouth Natural Hazard Mitigation Actions-Considered (Listed in order of priority by hazard)

Hazard	Status	Comment	Description
			and implement mitigation actions.
Winter Storms	Ongoing		Develop and maintain severe winter storm public outreach program defining mitigation activity benefits through educational outreach aimed at households and businesses while targeting of special needs populations.
Winter Storms	Ongoing		Develop personal use and educational outreach training for a "safe tree harvesting" program. Implement along utility and road corridors, preventing potential winter storm damage.
Winter Storms	Ongoing		Purchase NOAA Weather radios and develop a web portal linking residents to various weather information sites. (NWS, FEMA, The Weather Channel).
Winter Storms	Consider		Develop early warning test program partnering with NOAA, City Police, Fire Departments, and Volunteer Fire Department to coordinate tests.
Winter Storms	Ongoing		Increase power line wire size and incorporate quick disconnects (breakaway devices) to reduce ice load power line severe wind or winter ice storm event failure.
Winter Storms	Consider		Review critical facilities and government building energy efficiency, winter readiness, and electrical protection capability. Identify, prioritize, and implement infrastructure upgrade or rehabilitation project prioritization and development.
ENSO	Consider	Top Priority	Educate public regarding weather patterns associated with El Niño / La Niña.
Drought	Ongoing	Top Priority	Develop educational programs and initiatives related to water conservation and irrigation during drought periods.
Wildland Fire			
Wildland Fire	Ongoing	Top Priority	Develop, adopt, and enforce burn ordinances that require burn permits, restrict campfires, and controls outdoor burning.
Wildland Fire	Consider		Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high-risk areas.
Wildland Fire	Consider		Develop outreach program to educate and encourage home landscape cleanup (defensible space).
Wildland Fire	Consider		Reduce fire hazards by prohibiting back yard burning; this can be implemented by developing a citywide yard debris drop off program.
Earthquake			
Earthquake	Ongoing	Top Priority	Update the City Code to adopt, implement, and enforce current State of Oregon Building Codes.
Earthquake	Ongoing	Second Priority	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.
Earthquake	Consider	Third Priority	Disseminate FEMA pamphlets to educate and encourage homeowners concerning seismic structural and non-structural retrofit benefits.
Earthquake	Consider		Supplement State Seismic Needs Analysis data (schools, fire, law enforcement). Complete inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage.
Earthquake	Consider		Identify high seismic hazard areas; develop a wood-frame residential building inventory and an

Table 2 - City of Monmouth Natural Hazard Mitigation Actions-Considered
(Listed in order of priority by hazard)

Hazard	Status	Comment	Description
			outreach program to educate population concerning facilities particularly vulnerable to earthquake damage, such as pre-1940s homes and homes with cripple wall foundations.
Earthquake	Consider		Structurally retrofit important public facilities with significant seismic vulnerabilities, such as non-reinforced masonry construction (i.e. historic buildings)
Earthquake	Consider		Develop outreach program to educate residents concerning benefits of increased seismic resistance and modern building code compliance during rehabilitation or major repairs for residences or businesses.
Earthquake	Consider		Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current Building Codes.
Earthquake	Consider		Identify and prioritize a list of critical facilities with non-reinforced masonry problems including non-structural projects such as brick chimney bracing or replacement, water heater bracing, and anchoring, etc.
Earthquake	Consider		Evaluate critical public facility seismic performance for fire stations, public works buildings, potable water systems, wastewater systems, electric power systems, and bridges within the jurisdiction.
Earthquake	Consider		Develop outreach program for educating private facilities concerning alternative or emergency power source acquisition to enable them to deliver food, fuel, and medical services during disaster emergency response and recovery efforts.
Earthquake	Consider		Develop partnerships to mitigate hazards that result in jurisdictional facility lifeline or emergency transportation route closures.
Wind			
Wind	Ongoing	Top Priority	Identify and prioritize critical facilities' overhead utilities that could be placed underground to reduce power disruption from windstorm / tree blow down damage.
Wind	Ongoing	Second Priority	Enforce requirements to place utilities underground to reduce power disruption from windstorm / tree blow down damage when upgrading or during new development.
Wind	Consider	Third Priority	Identify alternate interoperable communication method as backup for emergency personnel when telephone lines are disrupted due to down power lines and cell phones are inoperable.
Wind	Consider		Review ordinances and develop outreach programs to assure mobile homes and manufactured buildings are protected from severe wind and flood hazards. (Anchoring, elevation, siting, and other methods as applicable)
Wind	Ongoing		Increase power line wire size and incorporate quick disconnects (breakaway devices) to reduce ice load power line failure during severe wind or winter ice storm events.
Erosion			
Erosion	Consider	Top Priority	Maintain and update erosion hazard locations, identify critical facilities potentially impacted and develop mitigation initiatives such as bank stabilization or facility relocation to prevent or reduce the threat.

Table 2 - City of Monmouth Natural Hazard Mitigation Actions-Considered (Listed in order of priority by hazard)

Hazard	Status	Comment	Description
Erosion	Ongoing	Second Priority	Develop and provide information to all residents on riverbank erosion and methods to prevent it in an easily distributed format.
Erosion	Ongoing		Install riprap, or pilings to harden or "armor' a stream bank where severe erosion occurs.
Erosion	Ongoing		Install bank protection such as rock, concrete, asphalt, vegetation, or other armoring or protective materials to provide riverbank protection.
Erosion	Ongoing		Develop an outreach program to educate the public concerning planting processes and materials used to stabilize hill slopes or stream banks. This is known as bioengineering, which uses logs, root wads, or wood debris or other vegetation to reduce scour and erosion.
Erosion	Ongoing		Harden culvert entrance bottoms with asphalt, concrete, and rock, to reduce erosion or scour.
Erosion	Ongoing		Install embankment protection such as vegetation, riprap, gabion baskets, sheet piling, and walls to reduce or eliminate erosion.
Erosion	Ongoing		Install walls at the end of a drainage structure to prevent embankment erosion at its entrance or outlet. (end walls).
Erosion	Ongoing		Construct a rock or concrete structure to dissipate energy or reduce flow velocity to prevent erosion of the streambed and banks.
Erosion	Ongoing		Install flared outlets or end sections at culvert entrances and outlets to match the embankment slope to reduce erosion and scour at the entrance and exit points during high flow.
Erosion	Ongoing		Install flow diverters a short distance into a water body, tied into the bank, designed to redirect water flow away from embankments to protect from erosion.
Erosion	Ongoing		Install channel lining using pipe, rock, concrete, or asphalt to reduce scouring embankments and ditch bottom erosion.
Erosion	Ongoing		Install bank revetment protection to prevent erosion.
Expansive Soils			
Expansive Soils	Consider	Top Priority	Review construction codes to require non-absorbent fill soils that slope away from foundations for a minimum of five feet to prevent ponding and water retention.
Expansive Soils	Ongoing		Require building design, engineering, and construction processes that address expansive soil conditions at potentially affected building sites.
Expansive Soils	Ongoing		Require road design, engineering, and construction processes that address expansive soil conditions. Water absorption prevention, impermeable membrane, soil compaction, and drainage methods need to be considered once geologic studies determine soil composition.
Expansive Soils	Ongoing		Develop educational programs and initiatives related to water conservation and irrigation during drought periods.
Technological Hazards			
Disruption of Utility and Transport Systems (DUTS)			
DUTS	Ongoing	Top Priority	Develop outreach program to educate and encourage residents to maintain several days of emergency supplies for power outages or road closures.

Table 2 - City of Monmouth Natural Hazard Mitigation Actions-Considered
(Listed in order of priority by hazard)

Hazard	Status	Comment	Description
DUTS	Ongoing	Second Priority	Review and update emergency response plans for utility disruptions.
DUTS	Ongoing	Third Priority	Identify and prioritize all "jurisdiction owned" & "non-jurisdiction owned" critical facilities that have backup power and emergency operations plans.
DUTS	Consider		Review and update emergency response plans for transportation route disruptions.
DUTS	Ongoing		Purchase backup power systems for all identified critical facilities.
HAZMAT			
HAZMAT	Consider	Top Priority	Enhance emergency planning, emergency response training, and equipment acquisition to address hazardous materials incidents for emergency and first responders and Public Works staff.
HAZMAT	Consider		Annually review and update HAZMAT inventories and ensure that emergency responders are trained for site-specific incidents.
HAZMAT	Consider		Evaluate existing security measures for sites with large quantities of hazardous substances (HS) or any quantities of extremely hazardous substances (EHS) and enhance security as necessary.
HAZMAT	Consider		Evaluate seismic bracing/anchoring for sites with large quantities of HS or any quantities of EHS.
HAZMAT	Consider		Train Public Works staff to identify EHS and to follow EMS protocols.
HAZMAT	Consider		Develop outreach program to educate the public regarding chemical hazards, safe handling, storage, and disposal procedures.
HAZMAT	Consider		Research, develop, and implement methods to protect waterways from hazardous materials events.
HAZMAT	Consider		Prepare a site-specific summary of hazardous materials used, stored, and commonly transported in the jurisdictional area. The summary should include mapped facility locations with a hazardous materials inventory, emergency response protocols, and mitigation actions.
HAZMAT	Consider		Expand the hazardous materials drop-off program to include more than one drop off day per year.

Natural Hazards Goals and Policies

Goal: To protect life and property in Monmouth from natural hazards and disasters.

Policies:

- Monmouth will adopt the Polk County Multi-Jurisdictional Hazard Mitigation Plan Update, which includes natural hazard mitigation goals and actions.

- Monmouth will designate a Hazard Mitigation Planning Team Leader to convene the hazard mitigation planning group. The planning group shall monitor implementation of the Hazard Mitigation Plan and shall submit a written progress report to the City Council.

- Monmouth will continue to participate in the National Flood Insurance Program. Monmouth will apply the floodplain overlay zone standards to development that occurs within designated 100-year floodplains.

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