

**CITY OF PHILOMATH
Storm Drainage System Master Plan**

**Section 2
STUDY AREA**

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2.1 Study Area

The City of Philomath is located in the center of Benton County, Oregon, approximately 5 miles west of Corvallis. The study area is approximately coincident with the urban growth boundary (UGB) of the City, except on its northern edge where it includes some unincorporated areas of Benton County which drain into the City's storm drainage system. The study area is bounded on the south by the Mary's River. The Corvallis-Newport Highway 20/34 bisects Philomath east to west, and provides the major road transportation to Philomath. Highway 20/34 is designated as Main Street within the City of Philomath. The Southern Pacific Railroad Co. also has a rail line passing through the City.

Philomath's Comprehensive Plan was developed in 1980 near the end of that period of the City's rapid growth. A large urban growth boundary (UGB) was established which encompasses 2,568 acres, approximately 2,000 of which are outside the present City Limits. Eventually the entire area will be part of Philomath and will be served by the City's utility systems.

The planning area for this report includes the land within the urban growth boundary as well as the areas outside the UGB but within the Newton Creek watershed which drain to the City storm drainage system. In addition to the areas within the UGB, the study area encompasses more than 1,300 acres north, east and west of the UGB which drain into and through the City.

The improvements recommended in this plan are based on development of land within the UGB in its present location, as well as the land use zoning and the associated runoff coefficients based on that zoning. It is assumed that no significant development will occur within the study area outside the UGB. Changes in any of these assumptions could change the recommendations contained in the master plan. Should significant changes in any of the above occur, the master plan should be updated accordingly.

2.2 Climate and Rainfall Patterns

The study area is located on the east side of the Coast range, with weather typical of the Willamette valley. The weather is characterized by warm dry summers and cool wet winters. Although there is no National Weather Service recording station in Philomath, there are extensive weather records for OSU Hyslop Field between Corvallis and Albany. While the data from this weather station is not specifically for Philomath, the State Climatologist office has indicated that these values are generally representative for the immediate area around Corvallis, including Philomath. A limited review of the rainfall data collected by the City at the wastewater treatment plant confirms that although there are daily and monthly variations, the annual average rainfall

is approximately the same. The localized variations in rainfall result from Philomath's proximity to the Coast range, particularly Mary's Peak.

The study area receives an average of 42 inches of precipitation annually, with the majority of the rainfall occurring during the winter months. Approximately 80 percent of the annual precipitation occurs between November 1 and April 30. Winters are characterized as mild, with very low temperatures being uncommon. Although there are an average of 55 days per year with temperatures below freezing, the average number of days on which the temperature does not rise above freezing during the day is less than 10. One of the region's hazards occurs when below freezing temperatures combine with rain to produce icy conditions. Summers are generally mild with little precipitation.

The rainfall intensity-duration-frequency curve for use in the City of Philomath is the ODOT Zone 8 IDF curve (see draft Public Works Design Standards, Appendix C).

2.3 Topography

Philomath is located on the western edge of the Willamette Valley, near the point the Mary's River leaves the Coast Range. The City center is located on the second bench north of the Mary's River. The natural surface drainage across the study area flows to the south, and the existing storm drainage system intercepts the flows and routes them into the Mary's River.

The topography within the City Limits generally is gently sloping and undulating. The topography within the study area ranges from relatively flat south of Main Street and along Newton Creek, to steeper slopes and hills to the north, east and west of the City. The elevation within the study area ranges from approximately 260 feet along the Mary's River to a high point of 1175 feet at the northern limits of the drainage basin. The majority of the land within the UGB is at or below an elevation of 400 feet, with the City center having an elevation of approximately 280 feet.

2.4 Soils and Geology

The City's Sewer Systems Facilities Plan prepared in 1985 and the Local Wetlands Inventory for the City of Philomath prepared in 1996 contain detailed discussions of the soils and geology within the UGB. These discussions on soil types are based from reports and maps prepared by the Soil Conservation Service (now the Natural Resource Conservation Service) showing the approximate locations of the Benton County soil types.

Although a detailed analysis of the soils and geology is outside the scope of this report, one soil characteristic evaluated by the Soil Conservation Service and these later reports was the surface drainage capacity. Two the five major soil associations within the study area possess poor surface drainage characteristics. These soils occur in much of the eastern part of Philomath,

(between and on either side of both channels of Newton Creek) and along Hwy 20. Although poorly drained soils occur in a significant portion of the City within the planning area, including most of the industrial zoned areas, the undeveloped areas north of the City generally consist of moderately well drained soils.

The importance of this to this report is to emphasize that the soil infiltration capacity within the developable portions of the study area is limited at best, particularly during the late winter months after the ground has become saturated. These poor drainage characteristics form the basis for the runoff coefficients used in this study and in the design standards contained in Appendix C. Due to the soil types and drainage characteristics, it is not anticipated that the runoff coefficients of the land north of the City outside the UGB will change significantly even if low density rural development is to occur.

2.5 Land Use

The planning area is made up of land in three categories, namely land inside of Philomath's City limits, land outside of the City limits but inside of the Urban Growth Boundary, and land outside of the Urban Growth Boundary.

Land use zoning in the City of Philomath is comprised primarily of residential uses, although the Comprehensive Plan sets aside large areas for industrial development (approximately 800 acres), of which about 500 acres is presently undeveloped. Lesser amounts of land are designated for commercial, office, and public/open space uses. A copy of the current City zoning map as prepared by Benton County is attached, and identifies the City Limits, Urban Growth Boundary, and land use zones within the UGB.

a. Land Use within City Limits

The majority of the land within the City Limits is currently developed or partially developed. Much of the ongoing and anticipated development within the City is occurring outside the City Limits under deferred or delayed annexation agreements.

b. Land Use outside City Limits but within UGB

The majority of the land inside the UGB but outside the City Limits is undeveloped or underdeveloped. Of the undeveloped land inside the planning area and outside the City Limits, about 35 to 40% appears to be zoned for industrial use and the remainder for residential use. The majority of the industrial zoned land is either undeveloped or being utilized at less than the anticipated zone intensity.

The study area includes several large tracts of land currently under agricultural use in the southern portion of the UGB. However, the agricultural parcels are generally too small to support intensive commercial agriculture activities.

c. Land Use outside UGB

Land within the planning area which is outside the UGB is located between the northern boundary of the UGB and the ridges to the north. Most of the land within this area is unimproved pasture land, timbered, or developed as very low density residential uses. The Benton County zoning for this land will preclude any intensive development in this area unless the Philomath or Corvallis UGBs are expanded.

2.6 FEMA Flood Insurance Status

The Mary's River is the primary stream within the study area. It extends approximately 40 miles from its confluence with the Willamette River to its headwaters northwest of Philomath. Newton Creek, the only major tributary in the study area, enters the Mary's River at river mile 10.0. The Mary's River has a streamflow pattern similar to other Willamette Valley streams. It is typified by high flows during the winter and low flows during the summer months. Since 1940, Benton County and the United States Geologic Survey have maintained a gaging station on the Mary's River just downstream of the bridge on Bellfountain Road. Because of this station, excellent streamflow data is available.

The Mary's River flows from west to east along the southwestern edge of Philomath's UGB. The Federal Emergency Management Agency (FEMA) has established a 100 year floodplain designation and insurance ratings for the study area.

In 1968, the U.S. Congress passed the Flood Insurance Act which established a federal program enabling property owners to buy flood insurance at a reasonable cost (FEMA, 1980). In return, communities carry out local floodplain management measures to protect lives and new construction from future flooding. The program is administered by the Federal Insurance Administration within the Federal Emergency Management Agency (FEMA).

A community qualifies for the program in two separate phases -- the Emergency and Regular Programs.

During the initial Emergency phase, limited amounts of flood insurance become available to local property owners. A community's efforts to reduce flood losses are general, in many cases guided only by preliminary flood data. The map FEMA provides the community at this stage is called a Flood Hazard Boundary Map. It outlines the flood-prone areas within the community. Subsidized rates are charged for all structures regardless of their flood risk.

Under the Regular Program, the full limits of flood insurance coverage become available locally. The premiums charged for new construction vary according to exposure to flood damage. A structure's exposure is based upon the elevation at its lowest floor above or below the "Base Flood Elevation". The community's floodplain management efforts become more comprehensive under the Regular Program where new buildings are elevated or flood-proofed above certain flood

levels. These levels are derived from FEMA's detailed on-site engineering survey in the community. The community is issued a detailed map called a Flood Insurance Rate Map which shows flood elevations and risk zones used for insurance purposes.

To qualify for the flood insurance program, a community must: (1) require development permits for all proposed construction or other development in the community; and (2) review the permit to assure that sites are reasonably free from flooding. For its flood-prone areas, the community must also require: (1) proper anchoring of structures; (2) use of construction materials and methods that will minimize flood damage; (3) adequate drainage for new subdivisions; (4) the location and design of new or replacement utility systems to prevent flood loss; and (5) that all new construction and substantial improvements to existing structures in FEMA identified flood-prone areas be elevated or flood-proofed to the level of the base flood.

The base flood is a term used to describe the level of flooding the program is geared to protect against. While sometimes referred to as the "100-year flood", it is more accurate to consider it the flood having a 1 percent chance of occurrence in any year, or a 10 percent chance of occurrence during any 10 year period.

The City of Philomath presently participates in the regular phase of the Flood Insurance Program (date of entry into the Regular Program was June 15, 1982). Products of the flood insurance study include flood profiles and maps for the portions of Mary's River and Newton Creek within the City limits (Floodway panel 410011-0001, FIRM panel 410011-0001). Flood profiles and maps for those portions of the Mary's River and Newton Creek which lie outside of the city limits are included in the Flood Insurance Study prepared for Unincorporated Areas of Benton County (Floodway panel 410008-0067, FIRM panel 410008-0086C). Benton County is also a participant of the regular phase of the Flood Insurance Program (August 5, 1986). Copies of these flood maps are included in Appendix B.

For the Mary's River and Newton Creek, the studies define floodplains for the 100-year and 500-year floods and a 100-year, 1-foot floodway (the portion of the stream necessary to convey flow). To continue in the Flood Insurance Program, the City must require that all construction in the floodplain be elevated so the first floor is above the 100-year flood or be flood-proofed. Any construction in the floodway must be prohibited unless an engineering study can demonstrate the construction would not raise the 100-year flood elevation. In this Storm Drainage Master System Plan for Philomath, detailed hydrologic/hydraulic analysis were not performed to either verify or modify the current effective Flood Insurance Study.

It should be noted that the Floodplain and Floodway boundaries shown on the FEMA flood maps and the maps enclosed in this report are based on flood elevations, and as such the actual boundaries may vary slightly from the location shown. Final determinations of whether property is within the floodway or floodplain must be determined based on a topographic survey of the property in question.