Oregon
Theodore R. Kulongoski, Governor

Department of Land Conservation and Development
635 Capitol Street, Suite 150
Salem, OR 97301-2540
(503) 373-0050
Fax (503) 378-5518
www.lcd.state.or.us

NOTICE OF ADOPTED AMENDMENT

11/30/2009

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

FROM: Plan Amendment Program Specialist

SUBJECT: City of Grants Pass Plan Amendment
DLCD File Number 004-09

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. Due to the size of amended material submitted, a complete copy has not been attached. 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, December 11, 2009

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 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 THAT IT WAS MAILED TO DLCD. AS A RESULT, YOUR APPEAL DEADLINE MAY BE EARLIER THAN THE ABOVE DATE SPECIFIED.

Cc: LoraGlover, City of Grants Pass
Gloria Gardiner, DLCD Urban Planning Specialist
Chris Shirley, FEMA Specialist
John Renz, DLCD Regional Representative

<paa> YA

FORM 2

DLCD
Notice of Adoption

THIS FORM **MUST BE MAILED** TO DLCD
WITHIN 5 WORKING DAYS AFTER THE FINAL DECISION
PER ORS 197.610, OAR CHAPTER 660 - DIVISION 18

☐ In person ☐ electronic ☐ mailed
DATE STAMP
DEPT OF
NOV 23 2009
LAND CONSERVATION AND DEVELOPMENT
For DLCD Use Only

Jurisdiction: CITY OF GRANTS PASS
Local file number: 09-405000004 09-405000006
Date of Adoption:
Date Mailed: 11/20/09

Was a Notice of Proposed Amendment (Form 1) mailed to DLCD? **Select one** Date:

- ☑ Comprehensive Plan Text Amendment
- ☐ Comprehensive Plan Map Amendment
- ☑ Land Use Regulation Amendment
- ☑ Zoning Map Amendment FLOOD HAZARD OVERLAY ZONE
- ☐ New Land Use Regulation
- ☐ Other:

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached".

ADOPTION OF CURRENT EFFECTIVE FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE (FIRMs) DATED DECEMBER 3, 2009.

Does the Adoption differ from proposal? Please select one N/A

Plan Map Changed from: N/A to: N/A
Zone Map Changed from: N/A to: N/A
Location: N/A Acres Involved: N/A
Specify Density: Previous: N/A New: N/A
Applicable statewide planning goals:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Was an Exception Adopted? ☐ YES ☒ NO

Did DLCD receive a Notice of Proposed Amendment...

45-days prior to first evidentiary hearing?	☒ Yes	☐ No
If no, do the statewide planning goals apply?	☐ Yes	☐ No
If no, did Emergency Circumstances require immediate adoption?	☐ Yes	☐ No

DLCD file No. 004-09R (17697) [15858] (This file also refers to Grants Pass DLCD File 007-09)

Please list all affected State or Federal Agencies, Local Governments or Special Districts:

JOSEPHINE COUNTY
DLCD
FEMA

Local Contact: LORA GLOVER Phone: (541) 474-6355 Extension: 6427
Address: 101 NW A St Fax Number: 541 476 9218
City: GRANTS PASS OR Zip: 97526 E-mail Address: lglover@grantspassoregon.gov

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 Complete Copies** (documents and maps) 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. Electronic Submittals: At least **one** hard copy must be sent by mail or in person, but you may also submit an electronic copy, by either email or FTP. You may connect to this address to FTP proposals and adoptions: **webserver.lcd.state.or.us**. To obtain our Username and password for FTP, call Mara Ulloa at 503-373-0050 extension 238, or by emailing **mara.ulloa@state.or.us**.

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 not 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 now access these forms online at **http://www.lcd.state.or.us/**. Please print on **8-1/2x11 green paper only**. You may also call the DLCD Office at (503) 373-0050; or Fax your request to: (503) 378-5518; or Email your request to **mara.ulloa@state.or.us** - ATTENTION: PLAN AMENDMENT SPECIALIST.

City of Grants Pass

November 20, 2009

Department of Land Conservation & Development
Attn: Plan Amendment Specialist
635 Capitol Street NE, Suite 150
Salem OR 97301-2540

Re: Notice of Adoption ~ Flood Map Amendments
File No.: 09-40500004 & 09-40500006

Dear Sir/Madam,

Please find enclosed the Notice of Adoption for the above-referenced file. If you have any question, please do not hesitate to contact me.

Sincerely,

Lora Glover

Lora Glover
Associate Planner
Ext. #6427
lglover@grantspassoregon.gov

Enclosure: Notice of Adoption, Ordinance No. 5498 w/record

pc: Stephen Lucker, DLCD w/Ordinance No. 5498
Dennis Hunsinger, Acting Regional Administrator, FEMA Region X w/Ordinance No. 5498
C/F, tax lot file

ORDINANCE NO. 5498

AN ORDINANCE OF THE COUNCIL OF THE CITY OF GRANTS PASS AMENDING:

(1) THE SPECIAL PURPOSE DISTRICT MAP FOR THE FLOOD HAZARD DISTRICT BY ADOPTING THE CURRENT FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAPS (FIRM) FOR JOSEPHINE COUNTY AND INCORPORATED AREAS EFFECTIVE DECEMBER 3, 2009;

(2) SECTION 13.200 (FLOOD HAZARD DISTRICT) OF THE CITY OF GRANTS PASS DEVELOPMENT CODE; AND

(3) ELEMENT 5, SECTION 5.30 ~ FLOOD HAZARD, OF THE GRANTS PASS AND URBANIZING AREA COMPREHENSIVE COMMUNITY DEVELOPMENT PLAN; AND DECLARING AN EMERGENCY.

WHEREAS:

1. The Grants Pass and Urbanizing Area Comprehensive Community Development Plan was adopted December 15, 1982; and

2. The goal of the amendments is to maintain the City's eligibility to participate in National Flood Insurance Program (NFIP); and

3. The proposal is consistent with the goals and policies of the Comprehensive Plan; and

4. The applicable criteria from the Comprehensive Plan and the Development Code are satisfied, and approval of the proposal is recommended by the Urban Area Planning Commission to the City Council.

NOW, THEREFORE, THE CITY OF GRANTS PASS HEREBY ORDAINS:

Section 1: Adopt into the Comprehensive Plan the Flood Insurance Study (FIS) Volume 1 and 2, as set forth in Exhibit "A" attached hereto.

Section 2: Adopt into the Comprehensive Plan the Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective December 3, 2009 (amending the Special Purpose District Map for the Flood Hazard District), as set forth in Exhibit "A" attached hereto.

Section 3: Revise Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code as set forth in Exhibit "A" attached hereto.

Section 4: Revise Element 5, Section 5.30 ~ Flood Hazard of the Comprehensive plan, to reference the new FIS and FIRM effective December 3, 2009, as set forth in Exhibit "A" attached hereto.

Section 5: Repeal Sections 9.50-9.56 (Flood Hazard Regulations), Title 9: Land Development and Public Improvements of the City of Grants Pass Municipal Code, and re-title Chapter 4 of Title 9 as "Measure 7" as set forth in Exhibit "B" attached hereto.

Section 6: An emergency is hereby declared to exist and in the interest of the public peace, health and safety of the City of Grants Pass and the inhabitants thereof, this Ordinance has been introduced and read twice and placed upon its final passage at a single meeting of the Council and shall take effect immediately upon passage.

ADOPTED by the Council of the City of Grants Pass, Oregon, in regular session this 4th day of November, 2009.

SUBMITTED to and Approved by the Mayor of the City of Grants Pass, Oregon, this 6th day of November, 2009.

Michael Murphy
Michael Murphy, Mayor

ATTEST:

David Reeves
Finance Director

Date submitted to Mayor: 11-5-2009

Approved as to Form, Mark Bartholomew, Interim City Attorney MB

Exhibit "A" to Adopting Ordinance

Exhibit A consists of the following documents which have not been reproduced in their entirety to conserve resources:

1. Flood Insurance Study (FIS) for Josephine County, Oregon and Incorporated areas, dated December 3, 2009 (the full report is available in the Planning file).

2. Flood Insurance Rate Maps (FIRM) dated December 3, 2009 (the full set of maps is available in the Community Development office).

3. Revised Section 13.200 ~ Flood Hazard District of the Development Code (available in the Planning file).

4. Revised Element 5, Section 5.30 ~ Flood Hazard of the Comprehensive Plan (available in the Planning file).

Exhibit "B" to Adopting Ordinance

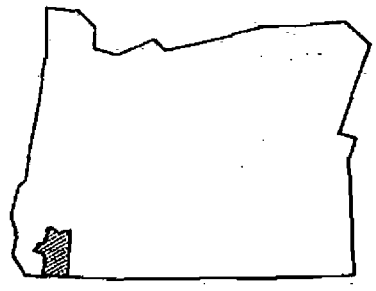
Exhibit B consists of the following document:

1. Revised Title 9 of the Municipal Code.

EXHIBIT A TO ORDINANCE

FLOOD INSURANCE STUDY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS VOLUME 1 OF 2



COMMUNITY NAME	COMMUNITY NUMBER
CAVE JUNCTION, CITY OF	410107
GRANTS PASS, CITY OF	410108
JOSEPHINE COUNTY UNINCORPORATED AREAS	415590

PROOF COPY

Effective:
December 3, 2009

Federal Emergency Management Agency
Flood Insurance Study Number
41033CV001A

EXHIBIT A
TO ORDINANCE

ATTACHMENT 1

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

Selected Flood Insurance Rate Map panels for the community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g. floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

Part or all of this may be revised and republished at any time. In addition, part of this FIS may be revised by a Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS report components.

This FIS report was revised on December 3, 2009. User should refer to Section 10.0, Revision Descriptions, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this FIS report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of this FIS report.

TABLE OF CONTENTS – VOLUME 1

FIGURES

TABLES

TABLES (continued)

TABLE OF CONTENTS – VOLUME 2

EXHIBITS

PUBLISHED SEPARATELY

FLOOD INSURANCE STUDY
JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates information on the existence and severity of flood hazards in the geographic area of Josephine County, including the Cities of Cave Junction and Grants Pass; and the unincorporated areas of Josephine County (referred to collectively herein as Josephine County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the studies in Grants Pass and unincorporated Josephine County were performed by the U.S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA) under Interagency Agreement No. IAA-H-14-78, Project Order No. 8. The analysis for the City of Cave Junction was performed under Amendment 1-2 of the same contract. Analyses for the City of Cave Junction and unincorporated Josephine County were completed in July 1980. The original analysis for the City of Grants Pass was completed in July 1979. The restudy of the reach of the Rogue River flowing through Grants Pass was performed by OTAK, Incorporated. This additional work was completed in December 1989 for FEMA under Contract No. EMW-89-C-2847.

The countywide update was performed by WEST Consultants, Inc. for FEMA under Contract No. EMS-20010-CO-0068. Updated aerial photography dated 2005 was used in the analysis. Work on the countywide update was completed in October 2008.

1.3 Coordination

The dates of the initial, intermediate, and final CCO meetings held for the previous FIS reports for Josephine County and the incorporated communities within its boundaries are shown in Table 1, "Initial, Intermediate, and Final CCO Meetings". They were attended by representatives of FEMA, the U.S. Geological Survey, the communities, and the study contractor.

Table 1. Initial, Intermediate, and Final CCO Meetings

Community	Initial CCO Date	Intermediate CCO Date(s)	Final CCO Date
Cave Junction, City of	January 12, 1978	May 12, 1980	June 3, 1981
Grants Pass, City of	January 1978	May 27, 1980 and May 25, 1988	September 19, 1990
Josephine County, unincorporated areas	January 12, 1978	May 12, 1980	June 3, 1981

Streams requiring detailed study were identified at a meeting held on January 12, 1978. In attendance were representatives of the U.S. Geological Survey, FEMA, Josephine County, and the communities of Cave Junction and Grants Pass. The U.S. Army Corps of Engineers (COE) provided hydrologic data for the original Rogue River study, reflecting anticipated flood-control regulation from Lost Creek Dam, located 55.4 miles upstream from the city.

Results of the hydrologic analyses were coordinated with the COE. Ending water-surface elevations at Savage Rapids Dam on the Rogue River were consistent with data furnished by the U.S. Geological Survey for the Jackson County Flood Insurance Study (Reference 1).

On May 12, 1980, an intermediate meeting reviewing preliminary work done by the study contractor was attended by representatives of the study contractor, FEMA, the City of Cave Junction, and Josephine County.

On May 27, 1980, the results of the original study for the City of Grants Pass were reviewed at the final community coordination meeting attended by representatives of FEMA, the city, and the study contractor. No problems were raised at the meeting.

A final coordination meeting for the City of Cave Junction and Josephine County was held on June 3, 1981. The meeting was attended by representatives of the FEMA, the study contractor, the City of Cave Junction, and Josephine County. All problems raised at the meeting were resolved.

Several flooding sources within Grants Pass, including portions of the Rogue and Applegate Rivers, and portions of Louse and Waters Creeks were selected for restudy at a meeting attended by representatives of FEMA, Josephine County, the City of Grants Pass, and the study contractor on May 25, 1988. Results of the hydrologic analyses performed by OTAK, Incorporated were coordinated with the COE, USGS, Soil Conservation Service, Oregon Department of Land Conservation and Development, and Josephine County. On September 19, 1990, the results of the restudy were reviewed at the final community coordination meeting attended by representatives of FEMA, the city, and the study contractor.

Countywide Update

An initial community coordination meeting for Josephine County was held on March 6, 2006. This meeting was attended by representatives of the Cities of Grants Pass and Cave Junction, Josephine County, FEMA, and WEST Consultants, Inc. The results of the study were reviewed at the final Consultation Coordination Officer [CCO] meeting held on March 5, 2009, and attended by representatives of the Cities of Cave Junction and Grants Pass, Josephine County, The Oregon Department of Land Conservation and Development and FEMA. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the geographic area of Josephine County, Oregon, including the incorporated communities listed in Section 1.1.

The flooding sources studied by detailed methods in unincorporated Josephine County and the City of Cave Junction were selected with priority given to all known flood hazards and areas of projected development or proposed construction through 1985. Projected development or proposed construction were considered through 1995 within the City of Grants Pass.

The limits of detailed studies in Josephine County were determined by FEMA with community and study contractor consultation at meetings in January 1978 and May 1988. Table 2 lists the flooding sources studied in detail and the included segments. River mileages used in this discussion are based on data published by the Hydrology Committee of the Columbia Basin Inter-Agency Committee (Reference 2).

Table 2. Flooding Sources Studied by Detailed Methods

Flooding Source	Limits of Detailed Study
1. Applegate River	From its confluence with the Rogue River to approximately 4,000 feet upstream of Wildcat Gulch near Murphy.
2. Deer Creek	From a point approximately one mile southwest of Selma (RM 3.5) to Crooks Creek.
3. Gilbert Creek	From SW Rogue River Avenue to approximately 875 feet upstream from NW North Hill Drive.
4. Illinois River	From the stream gaging station north of Kerby (near RM 50.0) to the confluence of the East and West Forks of the Illinois River.
5. East Fork Illinois River	From its confluence with the Illinois River to approximately 500 feet downstream from Sucker Creek near Cave Junction and from Little Elder Creek (RM 65.6) to Page Creek south of Takilma.
6. West Fork Illinois River	From its confluence with the Illinois River to the Redwood Highway bridge and from a point 870 feet downstream from Hugo Road at O'Brien (RM 7.8) to a point approximately 2.4 miles further upstream.
7. Jumpoff Joe Creek	From its confluence with the Rogue River to Monument Drive near Merlin.
8. Louse Creek	From its confluence with Jumpoff Joe Creek to Granite Hill Road.
9. Murphy Creek	From its confluence with the Applegate River to approximately 7,000 feet upstream from its mouth.

Table 2. Flooding Sources Studied by Detailed Methods (continued)

10. Rogue River	From Maple Creek near Galice (RM 75.2) to the Josephine-Jackson County limits at Savage Rapids Dam.
11. Rogue River Right Overbank	From its confluence with the main stem of the Rogue River to its divergence from the main stem of the Rogue River approximately 1,300 feet upstream from Lincoln Avenue.
12. Slate Creek	From its confluence with the Applegate River to approximately the intersection of Round Prairie Road and Redwood Highway.
13. Waters Creek	From its confluence with Slate Creek to approximately 6,200 feet upstream from its mouth.

Flows in Skunk Creek and Blue Gulch are well contained in rectified channels or underground conduits and were not included in the original study.

The consultation meetings in January 1978 and May 1988 further identified flooding sources for which the extent of floodway analysis would be limited or excluded. The Rogue River floodway was determined only from Pass Creek downstream of Grants Pass to the Josephine-Jackson County boundary. The Louse Creek floodway analysis was terminated at a point 2,100 feet downstream from the Interstate Highway 5 bridge. The detailed analysis of Murphy Creek did not include a floodway analysis. Floodway delineations were considered unnecessary in the areas already having multiple Federal, State, and county permit requirements for new construction (such as the area downstream from Pass Creek on the Rogue River).

Approximate analyses were used to study flooding sources in areas having a low development potential or minimal flood hazards. The scopes and methods of analysis were proposed to, and agreed upon by FEMA, Josephine County, and the Cities of Cave Junction and Grants Pass. These analyses were adopted from previously effective flood hazard boundary maps (Reference 3). Table 3 lists the flooding sources, grouped by watershed, which were studied by approximate methods.

Table 3. Flooding Sources Studied by Approximate Methods

1. Rogue River, Grave Creek, Wolf Creek, Coyote Creek, Limpy Creek, and Dutcher Creek.
2. Jumpoff Joe Creek, Quartz Creek, Bummer Creek, Bannister Creek, Schoolhouse Creek, and Harris Creek.
3. Slate Creek, Cheney Creek, Murphy Creek, Williams Creek, Banning Creek, and the East and West Forks of Williams Creek.
4. Deer Creek, Clear Creek, Draper Creek, Davis Creek, McMullin Creek, and Crooks Creek.
5. Illinois River, West Fork Illinois River, Mendenhall Creek, Rough and Ready Creek, Elk Creek, East Fork Illinois River, Kelly Creek, Tyger Creek, Sucker Creek, Democrat Gulch, Mulvaney Gulch, Althouse Creek, and Althouse Slough.

2.2 Community Description

Josephine County is located in southwestern Oregon, sharing its southern boundary with the State of California. Established in 1856, the county has an area of 1,625 square miles. Residential land development is present throughout the county due to the moderate climate and recreational features of the region. The estimated population of the county was 52,100 in 1978 (Reference 4). The population as of the 2000 census was 75,726 (Reference 5). The climate of Josephine County is typical of other areas of Oregon west of the Cascade Range. The average July temperature is 71.2°F; in January, the average temperature is 39.9°F. The Klamath Mountain Range to the west provides a minor orographic barrier to winter storms moving inland from the Pacific Ocean. Heavy winter rainfall usually occurs in the interior valleys, and deep snow accumulates at the higher elevations of the Cascade, Siskiyou, and Klamath Mountain Ranges. The average annual rainfall varies from approximately 30 inches in Grants Pass to over 60 inches in the Siskiyou Mountains. The Cascade Range, far to the east, accumulates almost 80 inches of precipitation (Reference 6).

Josephine County is drained almost entirely by the Rogue River and its two principal tributaries, the Applegate and Illinois Rivers. Steep, mountainous terrain lends to rapid runoff when mild temperatures and heavy rainfall melt snow at the higher elevations.

The Rogue River originates in the Cascade Range where the highest elevations exceed 8,000 feet. The drainage area of the river as it enters Josephine County at Savage Rapids Dam is 2,430 square miles. As the river flows westerly through the county, flood flows are fairly well contained by both banks until reaching the City of Grants Pass, 5.5 miles downstream of the dam. From Grants Pass to Finely Bend (9.9 miles west of the city), vast areas of low-lying terrain are subject to severe flooding. From Finley Bend, the river meanders north of Jumpoff Joe Creek (8.5 miles downstream). In these reaches, flood flows are subject to natural bank constrictions which result in sizable ponding of water. Beyond Jumpoff Joe Creek, the Rogue River flows northwesterly toward the resort community of Galice. In this reach, flood flows are totally contained by steep canyon walls, especially at Hellgate Canyon and at an unnamed canyon ending at Taylor Creek. In these canyons, flood flows become constricted to a few hundred feet in width. Beyond Galice, the river continues its westward passage through the Klamath Mountain Range until it eventually reaches the Pacific Ocean.

The Applegate River originates in the Siskiyou Mountains which form all but the northern boundary of the basin. The summit of the range reaches elevations of over 7,000 feet in some areas. The river enters Josephine County from the southeast at a point 7.5 miles upstream from the small community of Murphy. The drainage area at a discontinued gaging station at the bridge in Murphy is 663 square miles. Flood flows in a sharply meandering channel inundate wide portions of the floodplain that lie upstream from natural constrictions. Five miles downstream from Murphy, the river passes through a short, narrow canyon. After leaving the canyon, overbank flooding is moderate until the river becomes affected by backwater from the Redwood Highway (U.S. Highway 199) bridge near Wilderville. Here, extensive flooding occurs. Approximately 0.6 miles downstream from the bridge, the Applegate River becomes affected by backwater from the Rogue River. The inundated Applegate River flood plain width exceeds 4,000 feet at its mouth (6.4 miles west of the City of Grants Pass).

The eastern boundary of the Illinois River basin is also formed by the Siskiyou Mountains. The southern and western boundaries are formed by the Chetco Divide of the Klamath Mountain Range. Summit elevations vary from 4,000 to 6,000 feet. The headwaters of Illinois River consist of two principal tributaries, the East and West Forks Illinois River. The

East Fork Illinois River enters Josephine County from the south at a point 3.9 miles upstream from the community of Takilma. The drainage area at a gaging station located 0.3 miles north of the county limits is 42.3 square miles. General flooding occurs in most areas near Takilma except in a gorge east of the community. Farther north, extensive flooding occurs in the wide, flat floodplain downstream from the Redwood Highway Bridge near Cave Junction. The East Fork Illinois River joins the West Fork Illinois River to form the main stem of the Illinois River at the City of Cave Junction.

The West Fork Illinois River also flows northerly into Josephine County at a point 7.1 miles upstream from the community of O'Brien. The drainage area of a gaging station located approximately 4 miles north of the county limits is 42.4 square miles. The most significant flooding in O'Brien occurs at the Redwood Highway Bridge. Overflow inundates portions of the community before re-entering the channel downstream from the bridge. Farther north, near Cave Junction, flooding is much more severe. Wide areas are inundated, especially near the drive-in theater located 2.5 miles south of the community.

Below the confluence of its East and West Forks, the Illinois River flows northerly through fertile agricultural areas. Wide floodplains between Cave Junction and Kerby (2 miles to the north) become completely flooded. The flooding north of Kerby is equally severe, caused in part by a sharp bend in the river as it enters a narrow canyon. Beyond the mouth of the canyon (2.5 miles north of Kerby), the Illinois River continues westward through the Klamath Mountain Range until it meets the Rogue River at the summer resort community of Agness in Curry County, 50.2 miles downstream.

Deer Creek, a tributary of the Illinois River, is located entirely within Josephine County. The creek originates in the Siskiyou Mountain foothills, south of Grants Pass, and flows westerly toward the community of Selma. The drainage area of the stream at a point 3.5 miles upstream from its mouth is 101 square miles. Flood plains in the Selma area are low and flat. Extensive flooding occurs in this agricultural area.

City of Cave Junction

The City of Cave Junction is in the southwestern portion of Josephine County. The city, surrounded by unincorporated areas of Josephine County, is approximately 25 miles southwest of Grants Pass, Oregon, and 12 miles north of the Oregon-California State boundary.

Cave Junction, incorporated in 1948, is the second largest city in the county, with an estimated 1978 population of over 800. Its population as of the 2000 census was 1,363 (Reference 5). Residential development is present throughout the area due to the moderate climate and recreational features of the region.

The climate of Cave Junction is typical of other areas of Oregon west of the Cascade Range. The average July temperature is 71.2°F; in January, 39.3°F. The Klamath Range to the west provides a minor orographic barrier to winter storms moving inland from the Pacific Ocean. Heavy winter rainfall usually occurs in the interior valleys, and deep snow accumulates at higher elevations of the Cascade, Siskiyou, and Klamath Mountain Ranges. (Reference 6).

City of Grants Pass

The City of Grants Pass is situated along the Rogue River in eastern Josephine County approximately 25 miles northwest of Medford, Oregon, and 30 miles north of the Oregon-California State boundary.

Incorporated in 1887, Grants Pass is the county seat and had a population of 23,023 as of the 2000 census. The city extends across a 3-mile-wide valley and is bounded by densely wooded hills to the north and south. Fertile lowland areas support a sizable agricultural industry; timber and related byproducts are also important to the economy. Seasonal recreation fishing and character excursion trips on the Rogue River make Grants Pass a very popular tourist center.

The Rogue River floodplain within the city has areas of dense residential and commercial development. Aerial photographs show that some small tracts of land are undeveloped, but local land use measures may dictate the type and extent of future development. Gilbert Creek has a very high density of residential development.

The drainage area of the Rogue River at the gage in Grants Pass is 2,459 square miles. The river originates in the Cascade Range, where heavily forested slopes reach elevations exceeding 8,000 feet. These steep slopes usually accumulate heavy winter snowfall, and storm runoff is rapid when mild temperatures and sustained rainfall occur during the passage of a Pacific storm front. An exception to this general runoff characteristic occurs above an elevation of 5,000 feet in the vicinity of Crater Lake. Highly permeable pumice soils and lava formations allow much of the rainfall and snowmelt to infiltrate the ground, thus reducing surface runoff (Reference 7).

The drainage area of Gilbert Creek is 5.68 square miles at its mouth. The creek originates in the foothills north of the city, where the highest elevation is approximately 3,100 feet. The channel gradient is very steep until reaching the city, and peak flows usually occur within hours after the passage of a storm front.

Topography varies from the steep, forested slopes of Blue Gulch in the northwestern part of the city to the more gently sloping floodplain of the rest of Grants Pass. Elevations range from approximately 900 feet along the Rogue River to over 1,500 feet in the northwestern portion of the city (Reference 8).

The average annual temperature is 54°F, with historic extremes ranging from 114°F in 1928 to -1°F in 1972 (Reference 9). Average annual rainfall varies from approximately 30 inches in the vicinity of Grants Pass to almost 80 inches in the extreme northeastern corner of the basin near Crater Lake (Reference 6).

2.3 Principal Flood Problems

Abnormally heavy or prolonged rainfall, sometimes combined with snowmelt and frozen or nearly saturated ground, may cause flooding in Josephine County.

All streams in Josephine County usually respond to the same storm event, but the quantitative response can vary considerably. For example, most steams reached record stages during the devastating floods of December 1964; peak stages on the Applegate River, although high in 1964, were exceeded in January 1974.

A comparison of historical floods at gaging stations must consider the possibility of changes that might occur in the stream channels between storm events. The scouring of a stream channel could result in the greater flood having a lower recorded elevation.

Flood flows tend to attenuate as they move downstream due to the lessening of the channel gradient and to the storage of water in the flood plains. Gaging-station records collected in the upper part of a basin are, therefore, seldom representative of the runoff characteristics in the lower basin.
The largest flood in recent times occurred on the Rogue River on December 23, 1964. A peak flow of 152,000 cubic feet per second (cfs) inundated large residential areas in and around the City of Grants Pass. A storm hydrograph at the Grants Pass gaging station showed the maximum stage was reached within 2 days after the initial raise in stage, and overbank flows remained for almost 4 days after the peak occurred. Antecedent climatological conditions were: 90 inches of snow had accumulated at Crater Lake by December 21, the freezing level rose to 11,000 feet on December 22, and rainfall totaled 8 to 10 inches at several reporting stations on December 21 and 22. The Crater Lake snow depth decreased to 68 inches by December 23 with a loss of 4 to 5 inches in water content (Reference 10). Downstream from the city to approximately Finley Bend, thousands of acres of productive farmland were under as much as 10 feet of water. Severe erosion and siltation occurred, and extensive irrigation systems were destroyed. It is estimated that 360 residences, 19 commercial establishments, and 2 industries were damaged in this area (Reference 10).

Downstream from Finley Bend, the river meanders in and out of deep canyons where development consists of ranches, summer homes, and recreational facilities. In December 1964, it is estimated 70 residences were flooded, and 18 were completely destroyed (Reference 10).

Based on 38 years of records collected at a gaging station in Grants Pass, it is estimated that a flood of that magnitude would have occurred on the average of once every 50 years prior to the construction of Lost Creek Dam. It would now occur on the average of once every 120 years with anticipated flood regulation in effect (Reference 11).

In the past 120 years, the December 1964 flood is believed to have been exceeded twice in Grants Pass. The U.S. Army Corps of Engineers estimates a flood in December 1861 had a discharge of 175,000 cfs; in February 1890, 160,000 cfs (Reference 10). They estimated that, due to upstream storage, discharges of that magnitude would now occur on the average of once every 180 years and 140 years, respectively (Reference 11).

Gilbert Creek in Grants Pass is ungaged and quantitative historical high-flow data are unknown. Residents living adjacent to the channel have observed road overflow at various culverts throughout the city. There is severe channel encroachment in many areas due, in part, to vertical retaining walls built at the edge of the low-water channel. A house on L Street spans the channel and will obstruct high flows.

On the Applegate River, the largest peak recorded at a gaging station located 1.8 miles southeast of the Town of Applegate in Jackson County occurred on January 15, 1974. A peak discharge of 37,200 cfs exceeded the December 22, 1964 peak of 2,500 cfs. Extremely unstable channel conditions make an exact comparison of instantaneous peak flows impossible, and revisions of previously published data have been necessary.

Flood damage to agricultural lands was extensive, but most of the damage occurred in areas

upstream from the Town of Murphy. It is estimated that 2900 acres of productive farmland were inundated (Reference 12). Most of the residential damage occurred downstream from Murphy when the river scoured a sharp bend and inundated almost 200 acres.

Based on 38 years of data collected at the Applegate gaging station, it is estimated that a flood of the magnitude of the 1974 peak would reoccur on the average of once every 20 years. Now that the Applegate Reservoir is completed, the recurrence interval has been lengthened.

The largest flood on Slate Creek occurred on December 22, 1964. A peak flow of 4,650 cfs was recorded at a gaging station located 3.6 miles upstream from the community of Wilderville. Flood damage was not extensive because of the sparse population at that time.

Based on 19 years of data collected at the gage, a flood of this magnitude would reoccur on the average of once every 8 years.

The largest flood recorded in the Illinois River basin occurred on December 22, 1964. Two gaging stations located in the upper basin near Takilma and O'Brien indicated unit runoff values of approximately 380 cfs per square mile. Instantaneous peak flows were 15,700 cfs near Takilma and 16,100 cfs near O'Brien. A gaging station located in the lower part of the basin near Kerby had a peak flow of 92,200 cfs and a unit runoff of approximately 240 cfs per square mile. The above unit runoff values are the highest ever recorded in Josephine County.

Because of the sparse population at the time, flood damage primarily involved highway bridges and agricultural land. Water depths of over 15 feet covered the Redwood Highway north of Kerby. Some homes were observed floating away from their foundations during the flood.

Based on 15 years of records collected at the gaging station on Illinois River near Kerby, it is estimated a flood of this magnitude would occur on the average of onee every 150 years. In the upper basin where the flood runoff was more intense, the recurrence interval is estimated to be 500 years at Takilma and 300 years at O'Brien. The Takilma gaging station has 39 years of record; O'Brien, 22 years.

Extensive flood damage also occurred in the small tributary basins of Josephine County. Deer Creek, Jumpoff Joe Creek, and Louse Creek, although ungaged, had the highest flows ever observed during the December 1964 storm. Many drainage structures were damaged, resulting in the disruption of traffic. Farmland on the narrow terraces of the valleys suffered erosion and silt accumulations. Without streamflow data, it is not possible to derive statistical flow data for this flood.

2.4 Flood Protection Measures

There are two functioning flood-control reservoirs in the basin. Lost Creek Dam, located 55.4 miles upstream from the gage in Grants Pass, will reduce the magnitude of peak-flow events. It is estimated that a flood of the magnitude of the 1964 Rouge River flood would have occurred approximately once every 50 years prior to the construction of Lost Creek Dam. It should now occur on the average of approximately once every 120 years with existing flood regulation in effect. Due to upstream storage, discharges of the magnitude of the 1861 and 1890 Rogue River floods would now occur approximately once every 180 years and 140 years, respectively (Reference 13). Applegate Reservoir on Applegate River

is also located in Jackson County, 33.6 miles upstream from the community of Murphy.

Construction of Elk Creek Dam began in 1986 and ceased in 1988. The completed portion of the dam was subsequently breached beginning in July 2008. No flood control is provided by the remaining structure.

There are no extensive levee systems in the county. Some private interests have constructed dikes adjacent to their property; their capability of withstanding sizable flood events is unknown.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

Federal Emergency Management Agency standards require Flood Insurance Studies in adjacent areas to use consistent hydrologic analyses. Accordingly, the hydrology of the Rogue River in Josephine County is identical to that used in the Jackson County Flood Insurance Study (Reference 1). The U.S. Army Corps of Engineers has since revised that hydrology (Referenee 11) as shown in the following table (discharges are in cfs).

	Discharges	
Flood Event	Josephine County	Revised Hydrology
10-percent-annual-chance	73,000	70,000
2-percent-annual-chance	128,000	120,000
1-percent-annual-chance	144,000	153,000
0.2-percent-annual-chance	260,000	280,000

Both sets of data are based on 38 years of stream flow records collected at Grants Pass gaging station (1939-1976). The discharges are adjusted for expected probability and include anticipated flood-control regulation from Lost Creek Dam. The revised values are still within the 90 percent confidence limits of the original values. The regulating effect of the proposed Elk Creek Dam currently in development by the COE has been evaluated.

Table 4. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
Applegate River					
At Confluence with Rogue River	768	26,600	54,700	78,200	136,000
Above Slate Creek	714	24,200	50,300	72,600	128,000
At Wilderville Gaging Station (No. 14369500)	698	23,500	49,000	71,000	125,000
At Wildcat Gulch Near Murphy	654	21,600	45,400	66,500	118,000
Upstream of Wildcat Gulch	652	20,400	43,200	62,000	112,000
At River Mile 17	644	19,800	42,300	60,400	109,800
Deer Creek					
At River Mile 3.5 Near Selma	101.0	10,800	16,800	19,000	25,800
Below McMillan Creek	74.0	8,250	12,700	14,400	19,400
Below Crooks Creek	47.7	5,610	8,580	9,690	13,600
Gilbert Creek					
At Confluence with Rogue River	5.7	531	836	973	1,330
At West B Street	5.3	484	760	885	1,210
At Hillcrest Drive Sewer Outlet	4.4	398	625	728	995
Illinois River					
At Gaging Station No. 14377100 (Near Kerby)	380.0	54,900	77,300	86,800	10,900
At Former Gaging Station No 14377000 (at Kerby)	364.0	4,700	66,500	74,600	93,300
Below Confluence of East and West Forks of the Illinois River	346.0	44,900	63,500	71,200	89,000

Table 4. Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
East Fork Illinois River					
At Confluence with Illinois River	234.0	28,100	43,800	49,200	66,400
Below Sucker Creek	215.0	26,100	40,500	45,500	61,300
Below Little Elder Creek	67.6	9,670	14,600	16,400	21,800
Below Page Creek	50.1	9,060	12,800	14,500	18,200
West Fork Illinois River					
At Confluence with Illinois River	112.0	20,600	31,400	35,100	46,600
At U.S. Highway 199	105.0	19,400	29,500	33,000	43,300
At Rockydale Road	54.6	10,900	16,400	18,400	24,300
At River Mile 10.3 Near O'Brien	47.5	10,600	14,400	15,700	18,900
Jumpoff Joe Creek					
At Confluence with Rogue River	110.0	9,330	14,600	16,500	22,500
Below Quartz Creek	97.1	8,460	13,200	15,000	20,300
Below Louse Creek	75.2	6,790	10,500	11,900	16,200
At Monument Drive (U.S. Highway 99)	37.1	3,770	5,770	6,540	8,800
Louse Creek					
At Confluence with Jumpoff Joe Creek	30.9	2,840	4,130	4,890	6,560
At Interstate Highway 5	18.7	2,606	3,120	3,530	4,730
Upstream of Soldier Creek	16.5	1,850	2,780	3,160	4,220
At Granite Hill Road	13.5	1,550	2,320	2,630	3,520

Table 4. Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
Murphy Creek					
At Confluence with Applegate River	15.2	1,850	2,780	3,140	4,190
At River Mile 1.5 Near Murphy	13.9	1,710	2,560	2,900	3,860
Rogue River					
At Maple Creek Near Galice	3,500	119,000	212,000	254,000	442,000
Below Jumpoff Joe Creek	3,430	117,000	207,000	249,000	434,000
Below Applegate River	3,270	111,000	196,000	236,000	415,000
At Grants Pass Gaging Station (No. 14361500)	2,460	73,000	128,000	144,000	260,000
At Josephine County Limits	2,430	72,000	126,000	142,000	256,000
Slate Creek					
At Confluence with Applegate River	44.6	5,190	7,900	8,920	12,000
At Round Prairie Creek	39.8	4,690	7,130	8,050	10,800
At Confluence with Waters Creek	28.7	3,470	5,260	5,950	7,950
Waters Creek					
At Redwood Highway (199)	7.1	1,010	1,500	1,690	2,230
Upstream of Salt Creek	5.4	800	1,170	1,320	1,740
At Waters Creek Road	4.9	730	1,070	1,210	1,590

Construction of Elk Creek Dam ceased in 1988. The completed portion of the dam was subsequently breached beginning in July 2008. No flood control is provided by the remaining structure. However, since the regulated discharges, including the anticipated benefit of the Elk Creek facility, were found by OTAK, Inc. to fall within the 90 percent confidence interval of the unregulated discharges (i.e., without the Lost Creek and Elk Creek facilities), no changes were made to the discharges shown in the Summary of Discharges (Table 4).

The U.S. Army Corps of Engineers also provided concordant flood control from both Lost Creek and Applegate Reservoirs. The Applegate River data were based on records collected over an 18-year period at a discontinued gaging station near Wilderville.

The magnitude of the design floods on Slate Creek, and Illinois, East Fork Illinois, and West Fork Illinois Rivers was derived by using a log-Pearson Type III probability distribution (Reference 14) of the gaging station data referred to in Section 2.3. A generalized skew coefficient was determined from U.S. Water Resources Council Bulletin 17 (Reference 15). Discharges at sites within 5 to 25 percent of the gaging station drainage area were estimated using the following transfer formula:

$$Q_u = Q_g (A_u/A_g)^n$$

Where "Q_g" and "A_g" are the discharge and drainage area at the gage, "Q_u" and "A_u" are the discharge and drainage area at the ungaged location, and the exponent "n" is an exponent derived from regional flood-frequency equations published in the U.S. Geological Survey Flood-Frequency Analysis for Western Oregon (Reference 16).

Design floods at all other ungaged sites were determined using the flood-frequency equations included in the western Oregon analysis. The 0.2-percent-annual-chance flood equation for the Rogue River basin, not included in that report, is:

$$Q_{0.002}(500) = 105A^{0.91}(ST+1)^{-1.36}I^{1.04}$$

Where "A" is drainage area in square miles, "ST" is the area of lakes and ponds (in percent), and "I" is the rainfall intensity (2-year, 24-hour) in inches.

The Gilbert Creek hydrology is based on 25 years of peak-flow data collected at a gaging station on Jones Creek, a small basin east of the the City of Grants Pass with headwaters adjoining Gilbert Creek. Jones Creek has a drainage area of 7.41 square miles at a gaging station located at the culvert entrance on Interstate Highway 5. The discharges used in this study were computed using a direct drainage area ratio of the two basins even though runoff in the urban areas of Gilbert Creek may differ from the rural runoff in the Jones Creek basin. If was beyond the scope of this study to conduct a detailed study of the effects of the storm-sewer inflows within the city.

In order to determine the magnitude of the design floods on Jones Creek, the 25 years of peak data were used in a log-Pearson Type III probability distribution, with a generalized skew coefficient determined from the U.S. Water Resources Council Bulletin 17 (Reference 15). The USGS computer program J-407 (Reference 14) detected no low outliers, and the discharges were not adjusted for expected probability.

The Gilbert Creek drainage area was determined on the basis of drainage maps provided by the City of Grants Pass (Reference 17) and by a USGS topographic map (Reference 8).

The 1989 OTAK, Inc. analysis computed flows for Louse Creek and Waters Creek using the USGS equations in the publication entitled "Magnitude and Frequency of Floods of Western Oregon" (Reference 16). The 0.2-percent-annual-chance Q equation, describe above, was also used. Salt Creek enters Waters Creek approximately one-half mile upstream of Waters Creek mouth. The hydrologic analyses for the upper portion of the Applegate River were conducted using records from the 42-year period of unregulated flow (i.e., 1939-1980) at the USGS gaging station near Applegate (No. 14366000) and the regulated flow curves provided by the COE. The accepted regulated discharges (i.e., regulation due to the Applegate Dam) were projected to additional locations of interest upstream of Wildcat Gulch near Murphy using the flow transfer formula described above. Peak discharge information was provided for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods on the Applegate River, although only the 1-percent-annual chance flood profile was computed.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Water-surface elevations were estimated at all cross sections by a computer program that computes energy losses between sections, using conservation-of-energy equations (step-backwater analysis). This hydraulic model requires accurate measurements of channel cross sections, bridge and dam geometries, and a proper evaluation of the roughness of the main channel and floodplains. The water-surface elevations at each cross section were determined by using the U.S. Geological Survey computer program E-431 (Reference 18).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM.

Channel and cross section properties were determined by photogrammetry based on aerial photographs taken September 30, 1978 (Reference 19). Bridge geometries and the underwater portion of the cross sections were surveyed in January 1979. Roughness coefficients (Manning's "n") were based on field observation and aerial photographs. The range of roughness values used for all floods is shown in Table 5.

Table 5. Range of Manning's Roughness Values

Flood Source	Main Channel	Flood Plain
Applegate River	0.032-0.042	0.032-0.080
Deer Creek	0.034-0.045	0.035-0.080
Gilbert Creek	0.032-0.055	0.035-0.085

Table 5. Range of Manning's Roughness Values (continued)

Illinois River	0.038-0.065	0.034-0.080
canyons near Kerby	0.045-0.050	0.034-0.080
Sours Flat area	0.038-0.042	0.034-0.080
near Pomeroy Dam	0.050-0.065	0.034-0.080
gravel & rock areas	0.040-0.045	0.034-0.080
East Fork Illinois River	0.035-0.055	0.035-0.080
West Fork Illinois River	0.045-0.060	0.050-0.080
overflow reach near Lone Mountain Road	0.035-0.070	0.040-0.080
Jumpoff Joe Creek	0.032-0.055	0.032-0.100
Louse Creek	0.033-0.048	0.035-0.080
Murphy Creek	0.045-0.050	0.045-0.080
Rogue River	0.030-0.065	0.032-0.090
through Grants Pass	0.031-0.038	0.031-0.200
Slate Creek	0.032-0.055	0.038-0.150
Waters Creek	0.030-0.070	0.038-0.110

The initial water-surface elevations for the flood profiles on the Rogue River were derived from a step-backwater convergence study made through a five-section reach ending at cross section A (Reference 20). Profile convergence was attained for each of the prescribed flows by using the U.S. Geological Survey computer program E-431.

The computation procedure requires a uniform change in channel conveyance between cross sections. Also, in rapidly expanding reaches, the program assumes 50 percent of the energy is recovered between sections (due to uncertain eddy losses). Program E-431 became invalid at the outlet of two narrow canyons where chute flows and hydraulic jumps occurred (cross sections R and AB). Therefore, water-surface profiles through these canyons were estimated, and the hydraulic model was reset at the canyon entrances using elevations derived by slope-conveyance studies.

Both Hellgate and Robertson bridges are built well above the 0.2-percent-annual-chance flood levels, and neither would constrict the flows.

The main channel varied from long calm reaches of silt, interlaced with boulders, to the bedrock outcrops of Hellgate Canyon. Flood plain vegetation varied from smooth, after-harvest hop fields to dense, forests.

The Rogue River floodway analysis began at cross section BU. The initial 1-percent-annual-chance flood elevation for the floodway was taken directly from the normal profile computed for the cross section. Because encroachment was not allowed downstream from cross section BU, no surcharge was computed for that cross section.

The hydraulic analyses of the reach of the Rogue River in Grants Pass began at a point approximately 2.3 miles downstream of the city, where the overbank flow breakout returns to the channel. Photographs of the 1964 flood revealed that there was divided flow downstream of the city. The December 1964 flood discharges in Grants Pass (152,000 cfs) closely approximated the published 1-percent-annual-chance discharge of 144,000 cfs. This

discharge resulted in well-defined overflows at the sewage treatment plant and at the Roguelia Mobile Home Park.

The initial hydraulic analyses were conducted to identify the various flow behaviors. Three distinct flow patterns occurred:

1. The 10-percent-annual-chance flow was contained in the channel.
2. The 2- and 1-percent-annual-chance floods caused overflows on the right bank.
3. The 0.2-percent-annual-chance flood completely inundated the floodplain.

An iterative hydraulic analysis for divided flows around the islands was undertaken to determine the flow distribution. In order to assess the significance of the overflows, survey data were collected to describe the control section over which these overflows would occur. These data were subsequently incorporated into the hydraulic model using the HEC-2 divided flow option. The hydraulic analyses required flow and water-surface elevation balances between the main stem and the north overbank at three different locations.

The results of the analysis were then compared with the 1964 flood photographs. It was identified that overbank flow returned to the channel at a point located approximately 2.3 miles downstream of the sewage treatment plant.

Surveys of typical cross sections for both the channel and the north overbanks were conducted and then compared to data used in the existing Flood Insurance Study hydraulic model of July 1980. It was determined that the variations between the old cross sections and the recently surveyed cross sections were less then one foot. Therefore the existing cross sectional data were retained for profile computations. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21).

The 1-percent-annual-chance profile on the Rogue River agreed favorably with many 1964 high-water marks found throughout the study area. However, an exact comparison of profiles is impossible in the lower reaches because of ungaged tributary inflow during the 1964 flood.

There was a small disagreement on the Rogue River between the computed profile elevations and elevations determined from a stage-discharge relation at a gaging station in Grants Pass. A minor adjustment was, therefore, prorated from the gage to the Seventh Street bridge, 0.6 mile downstream.

The 1989 restudy of the Rogue River analyzed the reach from a point approximately 3.5 miles downstream of the South 6th Street Bridge in Grants Pass to a point 2.2 miles upstream of the South 6th Street Bridge. The restudy included the proposed Redwood Highway crossing. The hydraulic study was conducted by the Oregon Department of Transportation's Hydraulic Division and was provided by FEMA to OTAK, Inc.

The restudy used discharge values based on the original values used in the Josephine County Flood Insurance Study of December 1, 1981, which included the regulating effect of the proposed Elk Creek Dam, soon to be completed by the COE. The regulated discharges include most of the anticipated benefit for the Elk Creek facility and were found to fall within the 90 percent confidence interval of the unregulated discharges (i.e., without the Lost Creek and Elk Creek facilities). The original cross sectional geometry and roughness

coefficients for the Rogue River restudy were retained from the original modeling for the restudy computations. Known elevations from the effective modeling were used for the starting water surface elevations of the restudy reach. The selected recurrence intervals were computed using of the COE HEC-2 step-backwater computer program (Reference 21). Photographs of the 1964 flood of the Rogue River at the City of Grants Pass revealed divided flows around the islands located just downstream of the city. To determine the flow distribution, the split-flow option of HEC-2 was used. It was identified that the right overbank flow returned to the channel approximately 2.3 miles downstream of the municipal sewage treatment plant.

The resulting water surface elevations matched within 0.2 feet of those published previously. The floodway analysis for the Rogue River restudy was computed using the full 1-percent-annual-flood discharge assuming no breakout flows.

Flood profiles for Gilbert Creek began at the culvert on Rogue River Avenue, the first point where energy controls would not be influenced by backwater from the Rogue River. The initial water-surface elevations were determined from composite stage-discharge relation computed at the culvert entrance.

A composite stage-discharge relation is a graphic presentation that combines the amount of water flowing through the culvert with the amount flowing over the road, then relates the total flows to an upstream water-surface elevation. Flows through 23 Gilbert Creek culverts were computed using USGS computer programs E-431 and A-526 (Reference 18 and 22). Most road overflow situations involved flat street surfaces where flow direction was difficult to determine. Where unconfined overflow occurred, the effective width was based on either the upstream channel geometry or the location of houses and garages in the approach section. In all cases, the amount of road overflow was computed using coefficients published in the USGS Techniques of Water-Resources Investigations (Reference 23).

Storm-sewer inflows were estimated at West B Street and at Hillcrest Drive using outlet pipe diameters and by assuming the pipe gradient was equal to the ground slope to the nearest manhole structure. Resultant discharges were derived from the Manning equation for pipe flow as given in King's Handbook of Hydraulics (Reference 24).

Both Gilbert Creek and Jones Creek have a trans-basin irrigation canal in the upper basin. The Tokay Canal diversion from the Rogue River is at a pumping station at Savage Rapids Dam, located 6.1 miles upstream from the Grants Pass gaging station. The canal contribution to flood flows is uncertain because some flows can enter the basin as spillage from the canal. The ditch capacity at the pumping plant is 47 cfs, but the capacity upstream from Hawthorne Avenue is only 27 cfs. This study assumes ditch flows are negligible during peak events.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Initial water-surface elevations for the profiles on Jumpoff Joe Creek reflected concordant flows of the Rogue River. The 1-percent-annual-chance flood elevations on Rogue River extended 2.2 miles up the Jumpoff Joe Creek channel. The initial water-surface elevation used for the floodway analysis was estimated from a slope-conveyance study that did not consider concordant flow or backwater. The Jumpoff Joe Creek profiles continued uninterrupted past the confluence of Louse Creek in Merlin. An increase in channel gradient

upstream from Merlin made it necessary to establish additional cross sections. These cross sections were estimated by interpolating between the geometries of the two nearest cross sections, and by using a map having 4-foot contour intervals (Reference 19).

Supercritical flow situations were encountered at three cross sections. Each situation required a resetting of the model using critical-depth elevations for each of the prescribed flows.

At Russell Road, the 0.2-percent-annual-chance flood overflowed the highway at a point 800 feet south of the bridge. A composite flow situation could not be computed because the flow in the main channel and flow in the overflow section did not share a common headwater elevation. Road overflow was estimated.

The main channel consisted of gravel and small boulders and the overbank areas varied from pastures to dense forests.

The initial water-surface elevations for profiles on Louse Creek were headwater elevations computed for the railroad bridge in Merlin. The headwater elevations were manually computed from a critical-depth section at the outlet of the bridge. Exact discharge values could not be determined because of unknown inflow from Harris Creek, a large tributary with a bridge 450 feet north of the Louse Creek channel. There is an exchange of flow between the two channels via a large ditch at the toe of the railroad embankment. An apportionment of flow through each structure could not be made because there is no common headwater elevation due to the lateral slope of the terrain. For the purpose of this study, it was assumed no peak flow exchange occurs during flooding.

The 1-percent-annual-chance flood on Louse Creek was found to be contained within the main channel except at the railroad bridge in Merlin and at a bridge on Monument Drive. A portion of the Louse Creek floodplain, downstream of Monument Drive, was found to be susceptible to 1-percent-annual-chance sheet flow, a condition of overland flow where elevations and directions of flow are difficult to determine. Small embayments at the mouths of tributaries also would experience flooding. A floodway was designed to occupy the entire width of the 1-percent-annual-chance floodplain because any encroachment on the main channel would increase the stream velocities and aggravate bank erosion. Supercritical flow occurred at 18 cross sections in this reach.

Because of the steep channel gradient, 21 additional cross sections were needed to define a continuous profile. The additional cross sections were estimated as described in the Jumpoff Joe Creek discussion.

Approximately 30 percent of the 1-percent-annual-chance flood flow on Louse Creek bypasses the bridge at Monument Drive at a point 600 feet north of the channel. The flow capacity of the bridge would not allow any encroachment on the flood plain, and a floodway analysis was not attempted.

The channel consisted of gravel and cobbles, with some overhanging brush, and overbank values ranged from pasture grass to dense forest.

The 1989 study by OTAK, Inc. extended the portion of detailed study for Louse Creek by adding a reach extending from approximately 470 feet downstream of Monument Drive upstream to its crossing of Granite Hill Road, a distance of 2.9 miles. The starting water

surface elevation for the extended reach was based on known elevations from the effective modeling. Channel and cross section properties were surveyed between February and June of 1989. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21). The average fall of Louse Creek throughout the study reach was approximately 90 feet per mile. This steep slope resulted in many supercritical flow conditions even though surveyed cross sections were taken at an average interval of 600 feet along the creek. Because of the steep channel gradient; 24 additional cross sections were added to the hydraulic model. Overall, the 1-percent-annual-chance floodplain width on the upper Louse Creek varied from 50 feet to 1,000 feet.

Because of the steep channel gradient for Louse Creek, the equal conveyance encroachment option that operates on the energy gradeline was used for the floodway analysis. This method is suggested for steep waterways since it will not allow unreasonable encroachments. The resulting floodway widths varied from 30 feet to 230 feet.

The flood profiles for Applegate River began at its confluence with the Rogue River. Initial water-surface elevations were based on concordant flows where backwater extended 1,180 feet up the Applegate River channel. The initial water-surface elevation for the floodway analysis was determined from a stage-discharge relation established at cross section BZ on Rogue River and does not consider concordant flow or backwater.
A natural constriction at cross section Z caused a supercritical flow situation for the 0.2-percent-annual-chance flood. The change in the state of flow caused an unrealistic shape in the stage-discharge relation, and the 0.2-percent-annual-chance elevation was, therefore, estimated by extrapolating the rating curve.

Supercritical flows were also encountered at a low diversion dam at the mouth of Murphy Creek. The hydraulic model was reset using elevations derived by critical-depth computations. A direct weir formula could not be used because of excessive bypass flow around the ends of the dam.

The bed material of Applegate River varies from areas of unstable gravel and rock deposits to bedrock outcrops overlain by boulders and gravel. Much of the reach is subject to change due to scour and filling of bed material and to gravel mining. Floodplain vegetation varied from pasture grass to dense deciduous brush. On the south bank at cross section AE, an upstream bank projection would cause a portion of the cross section to become ineffective for transmitting flows due to a large eddy current. An unrealistically high "n" value was therefore assigned to reduce the conveyance in that portion of the cross section.

The 1989 OTAK, Inc. analysis extended the Applegate River study from the previous upstream limit of detailed study to the Josephine-Jackson County line, an addition of approximately 5.6 miles. Known water surface elevations from the effective modeling were used as the downstream boundary for the extended modeling. Cross section properties were surveyed between February and June of 1989. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21). No floodway was computed as a part of the 1989 analysis due to the lack of development pressure.

The average fall of the Applegate River throughout the 1989 study area was approximately 17 feet per mile. With surveyed cross sections taken at an average interval of one every 3,000 feet, many critical depth statements were encountered during the initial hydraulic

simulations. This problem was solved by using the interpolated cross sections option of the HEC-2 model. Approximately 21 cross sections were automatically inserted by the hydraulic model throughout this reach of the Applegate. Overall, the 1-percent-annual-chance floodplain width on the limited detail study portion of the Applegate varied from 1,200 feet to 2,700 feet.

Initial water-surface elevations for profiles on Slate Creek reflect concordant flows of Applegate River. Backwater extended 5,500 feet up the Slate Creek channel. The initial elevation for the Slate Creek floodway analysis was determined by a slope-conveyance study through the first five cross sections of the reach (to cross section C). Concordant flow with backwater was not a consideration for the floodway analysis. Main channel bed material consisted of areas of rock and gravel deposits interlaced with boulders. The upper reach consisted of bedrock outcrops and boulders. Floodplain vegetation varied from moderate to extremely dense brush and tree growth.

Waters Creek, a small tributary to Slate Creek, was studied by OTAK, Inc. in 1989 from its confluence with Slate Creek upstream for a length of approximately 1 mile. The starting water-surface elevation was computed using the slope-area method. The backwater elevations from Slate Creek at the confluence were computed based on a normal depth approximation for Slate Creek using a discharge computed from the flow/area transfer formula (Reference 16). The Waters Creek confluence is located approximately 3 miles upstream of the confluence of Hound Prairie Creek. Channel and cross section properties were surveyed between February and June of 1989. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21). The average fall of Waters Creek throughout the study reach was approximately 50 feet per mile. This steep slope resulted in many supercritical flow conditions, even though surveyed cross sections were taken at an average interval of 300 feet along the creek. Because of the steep channel gradient, 17 additional cross sections were added to the hydraulic model. Overall, the 1-percent-annual-chance floodplain varied from 80 feet to 420 feet.

Because of the steep channel gradient for Waters Creek, the equal conveyance encroachment option that operates on the energy gradeline was used for the floodway analysis. This method is suggested for steep waterways since it will not allow unreasonable encroachments. The resulting floodway widths varied from 30 feet to 100 feet.

Initial elevations for the design-flood profiles for Murphy Creek were determined from a slope-conveyance study in the lower reach where all but the 0.2-percent-annual-chance flood were well contained in a rectified channel. A floodway analysis was not required on Murphy Creek. Headwater elevations at the Southside Road bridge were computed using the U.S Geological Survey computer program A-526 (Reference 22). Supercritical flows were encountered at two cross sections (E and I), and the model was reset using critical-depth elevations at each cross section. The 0.2-percent-annual-chance flood overflows Southside Road near the intersection of Williams Highway. Bypass flows then merge with Applegate River and do not re-enter the Murphy Creek channel. The extent of road overflow was estimated because a composite stage-discharge relation could not be established at the bridge.

Murphy Creek main-channel bed material consisted of loose rocks and boulders, and floodplain vegetation consisted of areas of unimproved pastureland, and moderate to dense brush and tree growth.

The flood profiles for the Illinois River began at a point 300 feet downstream from a gaging station near Kerby (No. 14377100). The stage-discharge relation developed at the gage was used to determine initial elevations. The velocity distribution in a vast ponding of water at Sauers Flat, upstream from the gage, is uncertain due to eddy currents and slack water. The limits of the effective velocities were then estimated until upstream profile elevations agreed with a stage-discharge relation established at a discontinued gaging station (No. 1437000) located at the Finch Road bridge in Kerby, 3.6 miles upstream from the initial cross section.

A low diversion dam near Cave Junction (Pomeroy Dam) was completely submerged by all flows and did not affect profile elevations. As previously mentioned, the computation of flood profiles continued uninterrupted up East Fork Illinois River to Sucker Creek. As the Illinois and East Fork Illinois Rivers were treated as essentially one river, cross section locations on the East Fork Illinois River refer to the starting point of the profiles, Illinois River Mile 50.0, approximately 6.4 miles downstream from the confluence of the Illinois, East Fork Illinois, and West Fork Illinois Rivers.

Cross section data for Illinois and East Fork Illinois Rivers were obtained from photogrammetry based on aerial photographs taken on September 30, 1978 (Reference 19). Bridge geometry and underwater portions of the cross sections were surveyed in January 1979.

There was a wide range in main-channel bed material throughout this study reach. In the canyon area north of Kerby, bed material consisted of boulders and bedrock outcrops. In the ponded reaches of Souers Flat, bed material consisted of soft bottom material with brushy banks.

Floodplain vegetation consisted of pastureland grass, cultivated farm lands (often bare during flood season), moderate to heavy brush and tree growth, and dense, deciduous brush and tree growth.

Effective velocities at Sauers Flat were estimated by assigning high "n" values to reduce the conveyance in the noncontributing areas of the floodplain. This technique was also used on East Fork Illinois River, upstream from the Redwood Highway. Extensive areas of shallow flooding were judged noncontributing because of the bank configuration upstream from cross sections M and N.

Initial water-surface elevations for the second segment of the East Fork Illinois River were determined by using the converging profile technique through five cross sections ending at cross section A. The effective channel at cross sections A and B was adjusted to exclude the embayment at the mouth of Little Elder Creek.

Supercritical flows were encountered at a narrow canyon near cross section J. The hydraulic model was reset using a critical depth elevation, and the profiles continued uninterrupted through the remainder of the reach.

Bed material in the commonly braided main channel consisted of large areas of unstable rock and gravel deposits. There are bedrock outcroppings and large, rounded boulders in the narrow confines of the canyons, but, generally, the entire reach appears subject to considerable movement of bed material. Flood plain vegetation consisted of some areas of pastureland, but moderate to heavy brush and trees predominated.

Flood profiles for the first segment of the West Fork Illinois River began at its mouth and reflect concordant flow conditions from the main stem of the Illinois River. Backwater from a 1-percent-annual-chance flood would extend 4,460 feet up the West Fork Illinois River channel. The initial concordant flow (or backwater) and was derived by modeling the base flood from Pomeroy Dam to the initial section at the mouth.

The effective velocities at the west bank of cross section J were uncertain due to the configuration of the upstream channel. The cross section width was therefore arbitrarily reduced to exclude an eddy flow situation.

The main-channel bed material consisted of large areas of irregular bedrock outcropping overlain in places by loose sand and gravel deposits. Wide gravel bars are evident where the low-water channel is deeply entrenched near one of the banks. Flood plain vegetation consisted of moderate to dense brush and tree growth.

Initial water-surface elevations for the second segment of the West Fork Illinois River profiles were derived by a convergence run through a reach (five cross sections) ending at cross section A. Flow was tranquil throughout the reach; the only problem encountered was a bypass-flow situation at the Redwood Highway bridge in O'Brien.

The low north bank of the channel upstream from the bridge allows water to flow toward the intersection of Lone Mountain Road and Redwood Highway, located 1,800 feet north of the channel. It is possible that some of the water overflows the intersection and bypasses the entire reach downstream from the bridge.

For the purpose of this study, it was assumed that the entire road overflow was limited to 850 feet of roadway immediately north of the bridge. This limitation was based on the position of the upstream berm which contains all flow at the approach cross section (cross section L).

Main channel bed material consisted of gravel bars at sharp channel curvatures, bedrock outcrops that formed deep low-flow pools and boulder-strewn reaches that appear unstable. Floodplain vegetation varied from pastureland grass to areas of dense brush and trees.

The initial elevations for the flood profiles on Deer Creek were estimated by a convergence run through a reach with six cross sections ending at cross section A.

McMullin and Thompson Creeks are tributaries that parallel Deer Creek throughout much of the central portion of this study reach. Although there is an exchange of peak flows near cross section R, it was assumed most inflow occurred at cross section P.

Main channel bed material consisted of sizable areas of rock and gravel deposits which are subject to considerable movement during flood stages. Floodplain vegetation varied from pasture grass to dense brush and tree growth. Large acreages of cultivated farmland also occupy the floodplains.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

The hydraulic analyses for this study were based on unobstructed flow conditions. The flood elevations thus derived are considered valid only if there are no significant changes made to the existing drainage structures or to other physical features of the channels (such as changes

in alignment and vegetation).

3.3 Vertical Datum

All FIS reports and FIRMS are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the completion of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are now prepared using NAVD 88 as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRMs are referenced to NAVD 88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the NGVD and the NAVD, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242
(301) 713-4172 (fax)

The conversion factor from NGVD to NAVD for all flooding sources in this report is +3.36 feet.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description and/or location information for benchmarks shown on the FIRMs, please contact information services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent annual-chance floodplain data, which may include a combination of the following: 10-, 2-,1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as

additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at scales of 1:2,400, 1: 4,800, and 1:62,500, with contour intervals of 2, 4, and 80 feet, respectively (References 8, 17, and 19).

Gilbert Creek boundaries were determined on the basis of random topographic elevations taken during the field surveys. They may, therefore, not show local variations of either higher or lower terrain between points of definition.

For streams studied by approximate methods, the boundary of the 1-percent-annual-chance flood were taken from the Flood Hazard Boundary Map (Reference 3).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the Flood Insurance Rate Map.

Countywide Update

As part of the countywide update, floodplain boundaries were digitized from the effective FIRM and Floodway panels. USGS topographic maps (Reference 25) and aerial photography (Reference 26) were used to adjust floodplain and floodway boundaries where appropriate.

The 1- and 0.2-percent-annual-chance floods were redelineated on Gilbert Creek and portions of the Rogue River using new topography with a one-foot contour interval provided by the City of Grants Pass (Reference 27). The cross section locations were digitized from the effective Floodway panels or work maps. Elevations used for the redelineation were taken from the effective floodway data tables and adjusted to the NAVD88 vertical datum. The redelineation along Gilbert Creek extended from SW Rogue River Avenue to just upstream of NW Windsor Drive, a distance of approximately 2.5 miles. Redelineation along the Rogue River extended from approximately river station 111,810 (cross section CD) to river station 158,250 (cross section DJ).

In accordance with FEMA Procedure Memorandum 36 (Reference 28), profile baselines have been included in all areas of detailed study. Profile baselines are shown in the location of the original stream centerline or original profile baseline without regard to the adjusted floodplain position on the new base map. This was done to maintain the relationship of distances between cross sections along the profile baseline between the hydraulic models, flood profiles and floodway data tables.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 6). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

For the purpose of developing the 1-percent-annual-chance floodway for the Rogue River, all of the flow was assumed to be confined to the main stem channel and its immediately adjacent overbank.

As agreed upon by county representatives and FEMA, the computation of floodways on the Rogue River, downstream of Pass Creek, on Murphy Creek, and on Gilbert Creek were not a requirement of this study.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

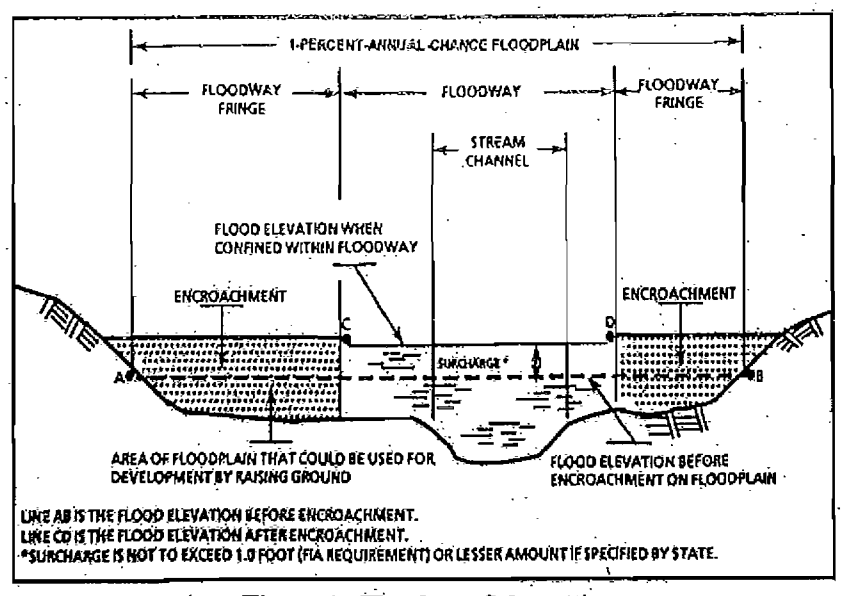


Figure 1. Floodway Schematic

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Applegate River								
A	3,960	463	5,210	15.0	876.9	872.7[2]	872.7[2]	0.0
B	7,980	2,900	13,100	6.0	883.8	882.8[2]	883.5[2]	0.7
C	10,860	1,530	8,000	9.8	890.3	889.6[2]	890.2[2]	0.6
D	12,780	670	6,740	11.6	896.2	896.2	896.6	0.4
E	14,160	580	8,240	9.5	901.1	901.1	901.4	0.3
F	15,300	560	7,240	10.8	905.7	905.7	905.7	0.0
G	15,900	880	14,000	5.6	909.5	909.5	909.5	0.0
H	17,080	1,860	17,800	4.4	909.9	909.9	910.3	0.4
I	18,560	1,840	10,300	7.6	911.4	911.4	911.9	0.5
J	20,350	1,010	7,130	10.2	916.2	916.2	917.2	1.0
K	21,200	778	6,420	11.3	919.5	919.5	919.6	0.1
L	23,480	571	8,300	8.8	926.5	926.5	926.5	0.0
M	24,920	570	6,200	11.4	928.9	928.9	929.4	0.5
N	27,160	234	4,440	16.0	934.9	934.9	935.9	1.0
O	29,480	517	8,960	7.9	942.7	942.7	943.7	1.0
P	31,810	355	4,820	14.7	946.9	946.9	947.5	0.6
Q	33,840	366	5,640	12.6	954.3	954.3	955.2	0.9
R	36,100	296	5,420	13.1	960.7	960.7	961	0.3
S	38,170	915	10,200	7.0	965.9	965.9	966.2	0.3
T	40,730	248	4,010	17.7	969.6	969.6	970.4	0.8
U	42,500	492	7,150	9.9	980.0	980.0	981.0	1.0
V	44,540	263	4,820	14.7	985.6	985.6	985.8	0.2
W	46,600	897	13,200	5.4	991.5	991.5	991.5	0.0
X	48,390	1,330	9,980	7.1	993.1	993.1	993.2	0.1

[1] Feet Above Confluence with Rogue River [2] Elevation Computed without Consideration of Backwater from Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

APPLEGATE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Applegate River (continued)								
Y	51,830	1,830	13,600	5.2	998.8	998.8	999.2	0.4
Z	54,160	520	4,300	16.5	1003.5	1003.5	1004	0.5
AA	55,530	550	6,360	11.2	1012.5	1012.5	1012.5	0.0
AB	57,740	900	10,200	6.9	1016.2	1016.2	1017.2	1.0
AC	59,520	600	6,843	10.4	1019.8	1019.8	1020.3	0.5
AD	61,520	1690	13,700	5.2	1,026.7	1,026.7	1,027.0	0.3
AE	64,540	1090	8,990	7.9	1,033.6	1,033.6	1,033.9	0.3
AF	67,470	1300	13,700	5.2	1,038.6	1,038.6	1,039.1	0.5
AG	69,360	830	6,930	10.2	1,042.2	1,042.2	1,042.6	0.4
AH	69,810	520	5,100	13.0	1,045.9	1,045.9	1,045.9	0.0
AI	70,370	455	4,660	14.3	1,048.5	1,048.5	1,049.2	0.7
AJ	70,820	562	6,720	9.9	1,053.6	1,053.6	1,053.6	0.0
AK	71,710	1110	10,200	6.5	1,054.7	1,054.7	1,055.5	0.8
AL	73,510	853	7,570	8.8	1,057.1	1,057.1	1,058.0	0.9
AM	75,230	678	7,300	9.1	1,062.0	1,062.0	1,062.9	0.9
AN	76,770	650	6,800	9.8	1,066.4	1,066.4	1,067.2	0.8
AO	77,870	575	5,730	11.6	1,069.5	1,069.5	1,070.1	0.6
AP	79,840	1765	11,400	5.8	1,076.0	1,076.0	1,076.2	0.2
AQ	82,800	1930	9,250	7.2	1,081.1	1,081.1	1,082.1	1.0
AR	84,870	872	6,850	9.7	1,088.1	1,088.1	1,089.0	0.9

[1] Feet Above Confluence with Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

APPLEGATE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Deer Creek								
A	0	463	2,873	6.6	1,296.3	1,296.3	1,297.3	1.0
B	1,010	640	2,989	6.4	1,298.9	1,298.9	1,299.6	0.7
C	1,960	494	3,836	5.0	1,301.1	1,283.1	1,302.1	1.0
D	3,120	459	2,161	8.8	1,302.8	1,302.8	1,303.8	1.0
E	3,330	490	3,390	5.6	1,307.7	1,307.7	1,307.8	0.1
F	3,760	440	4,141	4.6	1,308.2	1,308.2	1,308.5	0.3
G	4,290	300	2,827	6.7	1,308.6	1,308.6	1,308.8	0.2
H	4,670	350	2,638	7.2	1,309.0	1,309.0	1,309.4	0.4
I	6,570	384	2,152	8.8	1,314.8	1,314.8	1,314.9	0.1
J	8,280	570	4,321	4.4	1,320.3	1,320.3	1,321.1	0.8
K	9,410	384	2,352	8.1	1,322.3	1,322.3	1,323.2	0.9
L	10,660	590	2,419	7.9	1,328.1	1,328.1	1,328.4	0.3
M	11,760	500	2,586	7.4	1,332.9	1,332.9	1,333.9	1.0
N	12,770	450	2,703	7.0	1,336.3	1,336.3	1,337.0	0.7
O	14,130	700	3,345	5.7	1,340.8	1,340.8	1,341.5	0.7
P	15,250	592	2,261	6.4	1,344.6	1,344.6	1,345.4	0.8
Q	16,770	383	1,976	7.3	1,350.2	1,350.2	1,351.2	1.0
R	17,920	1,037	2,498	5.8	1,355.6	1,355.6	1,356.2	0.6
S	18,930	900	3,676	3.9	1,360.2	1,360.2	1,361.1	0.9
T	20,030	870	2,754	5.2	1,364.2	1,364.2	1,365.1	0.9
U	21,200	580	2,374	6.1	1,369.3	1,369.3	1,369.8	0.5
V	22,750	850	1,621	8.9	1,376.8	1,376.8	1,377.7	0.9
W	24,200	700	3,202	4.5	1,384.0	1,384.0	1,384.8	0.8
X	25,610	417	1,638	8.8	1,389.3	1,389.3	1,389.7	0.4
Y	26,710	540	2,306	6.2	1,396.0	1,396.0	1,396.5	0.5

[1] Feet Above River Mile 3.5

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Illinois River								
A	3,010	447	13,594	6.4	1,250.4	1,250.4	1,250.4	0.0
B	5,050	1,480	42,168	2.1	1,251.2	1,251.2	1,251.2	0.0
C	6,390	1,240	27,960	3.1	1,251.3	1,251.3	1,251.3	0.0
D	7,690	1,220	23,803	3.7	1,251.3	1,251.3	1,251.4	0.1
E	8,990	1,280	24,005	3.6	1,251.4	1,251.4	1,251.7	0.3
F	10,400	1,380	23,021	3.8	1,251.5	1,251.5	1,252.0	0.5
G	11,600	1,646	23,997	3.6	1,251.9	1,251.9	1,252.5	0.6
H	12,690	2,100	25,985	3.3	1,252.1	1,252.1	1,252.9	0.8
I	14,000	2,440	33,658	2.6	1,252.4	1,252.4	1,253.3	0.9
J	15,220	2,200	29,269	3.0	1,252.6	1,252.6	1,253.5	0.9
K	16,670	1,660	20,557	4.2	1,253.0	1,253.0	1,253.8	0.8
L	18,130	1,256	13,592	5.5	1,253.6	1,253.6	1,254.5	0.9
M	19,720	1,310	11,766	6.3	1,254.8	1,254.8	1,255.8	1.0
N	20,600	1,300	11,006	6.8	1,256.2	1,256.2	1,257.2	1.0
O	22,080	1,080	9,489	7.9	1,259.9	1,259.9	1,260.6	0.7
P	23,520	733	10,297	7.3	1,262.6	1,262.6	1,263.3	0.7
Q	24,550	674	10,641	7.0	1,263.7	1,263.7	1,264.4	0.7
R	25,750	729	12,025	6.2	1,265.1	1,265.1	1,265.8	0.7
S	26,640	829	11,623	6.4	1,265.9	1,265.9	1,266.6	0.7
T	27,600	738	11,048	6.8	1,266.8	1,266.8	1,267.6	0.8
U	28,870	404	6,262	11.9	1,268.5	1,268.5	1,269.1	0.6
V	29,940	471	7,645	9.8	1,271.9	1,271.9	1,272.1	0.2
W	31,020	686	8,534	8.7	1,274.9	1,274.9	1,275.1	0.2
X	31,860	385	6,587	11.3	1,277.2	1,277.2	1,277.6	0.4

[1] Feet Above River Mile 50.0

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Illinois River (continued)								
Y	33,000	650	8,133	9.2	1,282.4	1,282.4	1,283.1	0.7
Z	33,730	800	9,721	7.7	1,284.7	1,284.7	1,285.4	0.7
AA	34,740	1020	11,901	6.3	1,286.9	1,286.9	1,287.5	0.6

[1] Feet Above River Mile 50.0

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
East Fork Illinois River								
A	37,490	1,948[2]	18,382	4.1	1,290.4	1,290.4	1,291.3	0.9
B	38,480	579	6,175	8.0	1,292.1	1,292.1	1,292.9	0.8
C	39,690	345	3,934	12.5	1,296.2	1,296.2	1,297.0	0.8
D	40,140	657	7,903	6.2	1,302.4	1,302.4	1,302.4	0.0
E	40,870	770	6,082	8.1	1,303.4	1,303.4	1,303.4	0.0
F	41,870	900	6,649	7.4	1,305.8	1,305.8	1,306.3	0.5
G	43,010	900	10,105	4.9	1,308.2	1,308.2	1,309.2	1.0
H	44,370	1,010	7,270	6.8	1,310.8	1,310.8	1,311.7	0.9
I	45,530	1,140	9,506	5.2	1,314.8	1,314.8	1,315.8	1.0
J	47,260	1,000	6,659	7.4	1,320.2	1,320.2	1,321.2	1.0
K	48,350	835	7,108	6.9	1,324.2	1,324.2	1,325.2	1.0
L	49,240	800	7,124	6.9	1,327.0	1,327.0	1,327.7	0.7
M	50,550	1,118	8,714	5.2	1,330.4	1,330.4	1,330.6	0.2
N	52,170	1,325	7,461	6.1	1,333.4	1,333.4	1,334.4	1.0
O	53,160	1,580	8,298	5.5	1,337.2	1,337.2	1,338.2	1.0
P	54,450	1,450	8,357	5.4	1,343.0	1,343.0	1,343.5	0.5
Q	55,730	1,400	7,941	5.7	1,347.4	1,347.4	1,338.3	0.9
R	56,490	1,260	5,904	7.7	1,351.0	1,351.0	1,351.6	0.6
S	82,400	460	2,164	7.6	1,483.7	1,483.7	1,484.7	1.0
T	83,310	690	3,317	5.0	1,490.1	1,490.1	1,490.2	0.1
U	84,090	499	1,988	8.3	1,495.4	1,495.4	1,496.3	0.9
V	84,920	660	3,039	5.4	1,503.0	1,503.0	1,503.9	0.9
W	85,990	274	1,343	12.3	1,512.7	1,512.7	1,513.7	1.0
X	87,070	424	2,934	5.6	1,522.1	1,522.1	1,523.1	1.0
Y	87,770	582	1,467	11.2	1,526.2	1,526.2	1,527.0	0.8

[1] Feet Above Illinois River Mile 50.0 [2] Includes West Fork Illinois River Floodway

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

EAST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
East Fork Illinois River (continued)								
Z	88,110	733	3,317	5.0	1,532.2	1,532.2	1,532.2	0.0
AA	88,360	629	2,450	6.7	1,532.6	1,532.6	1,532.6	0.0
AB	89,360	207	1,205	13.6	1,538.8	1,538.8	1,538.8	0.0
AC	90,260	220	2039	7.1	1,545.3	1,545.3	1,545.3	0.0
AD	91,690	606	1,653	8.8	1,552.8	1,552.8	1,553.6	0.8
AE	92,880	389	1,542	9.4	1,566.5	1,566.5	1,567.1	0.6
AF	94,090	122	1,012	14.3	1,581.9	1,575.7	1,575.7	0.0
AG	95,030	209	1,850	7.8	1,581.9	1,581.9	1,582.3	0.4
AH	96,090	350	1,609	9.0	1,588.0	1,588.0	1,588.8	0.8
AI	97,030	394	1,939	7.5	1,597.5	1,597.5	1,598.4	0.9
AJ	98,090	375	1,725	8.4	1,606.1	1,606.1	1,607.1	1.0
AK	99,020	248	1,479	9.8	1,613.9	1,613.9	1,614.8	0.9
AL	99,820	210	1,096	13.2	1,623.3	1,623.3	1,624.0	0.7
AM	100,620	234	1,634	8.9	1,632.5	1,632.5	1,633.2	0.7
AN	101,310	286	1,277	11.4	1,638.6	1,638.6	1,639.6	1.0
AO	102,230	530	2,498	5.8	1,649.3	1,649.3	1,650.0	0.7
AP	102,940	580	1,324	11.0	1,657.3	1,657.3	1,657.5	0.2

[1] Feet Above Illinois River Mile 50.0

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

EAST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
West Fork Illinois River								
A	1,850	388	3,237	10.8	1,292.1	1286.5[2]	1286.6[2]	0.1
B	3,510	662	5,301	6.0	1,293.8	1292.1[2]	1293.0[2]	0.9
C	4,850	601	5,745	6.1	1,295.7	1295.1[2]	1296.1[2]	1.0
D	6,560	473	4,692	7.5	1,300.2	1,300.2	1,301.1	0.9
E	7,900	460	5,210	6.7	1,304.3	1,304.3	1,305.3	1.0
F	9,100	781	5,319	6.6	1,308.6	1,308.6	1,309.6	1.0
G	10,920	726	7,746	4.5	1,313.0	1,313.0	1,314.0	1.0
H	12,170	557	5,379	6.5	1,314.4	1,314.4	1,315.4	1.0
I	13,490	617	5,254	6.7	1,317.6	1,317.6	1,318.1	0.5
J	15,320	355	5,342	6.6	1,321.2	1,321.2	1,321.7	0.5
K	16,680	298	4,392	8.0	1,323.0	1,323.0	1,323.6	0.6
L	41,200	132	1,619	11.4	1,381.5	1,381.5	1,382.5	1.0
M	42,020	300	2,598	7.1	1,387.3	1,387.3	1,388.3	1.0
N	42,310	360	2,067	8.9	1,389.2	1,389.2	1,389.6	0.4
O	42,800	161	1,722	10.7	1,390.9	1,390.9	1,390.9	0.0
P	44,070	306	3,214	5.7	1,393.7	1,393.7	1,394.4	0.7
Q	45,180	200	1,835	10.0	1,395.0	1,395.0	1,395.8	0.8
R	45,940	168	1,698	10.8	1,398.3	1,398.3	1,398.4	0.1
S	47,110	200	1,492	12.3	1,405.8	1,405.8	1,405.8	0.0
T	48,120	330	2,826	6.5	1,411.7	1,411.7	1,412.1	0.4
U	49,250	634	2,735	6.7	1,415.3	1,415.3	1,415.6	0.3
V	49,910	632	2,566	7.2	1,418.7	1,418.7	1,418.7	0.0
W	50,070	590	2,031	9.1	1,422.2	1,422.2	1,422.2	0.0
X	50,880	410	1736	10.6	1,424.2	1,424.2	1,424.3	0.1

[1] Feet Above Confluence with Illinois and East Fork Illinois Rivers [2] Elevation Computed without Consideration of Backwater from Illinois River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
West Fork Illinois River (continued)								
Y	51,600	180	1726	10.7	1,431.8	1,431.8	1,432.5	0.7
Z	52,230	130	1,441	12.8	1,437.6	1,437.6	1,437.6	0.0
AA	52,920	200	1,486	12.4	1,442.1	1,442.1	1,442.4	0.3
AB	53,660	131	1,308	14.1	1,448.1	1,448.1	1,448.6	0.5

[1] Feet Above Confluence with Illinois and East Fork Illinois Rivers

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Jumpoff Joe Creek								
A	300	157	1,490	10.5	830.2	785.0[2]	785.0[2]	0.0
B	950	204	2,220	7.1	830.2	790.8[2]	787.8[2]	0.0
C	1,920	217	1,770	8.9	830.2	790.6[2]	790.6[2]	0.0
D	2,780	177	1,450	10.9	830.2	793.6[2]	794.3[2]	0.0
E	3,340	160	1,490	10.5	830.2	796.8[2]	796.8[2]	0.0
F	4,290	172	1,300	12.1	830.2	800.7[2]	800.9[2]	0.2
G	4,930	244	2,020	7.8	830.2	804.7[2]	805.4[2]	0.7
H	5,590	145	1,300	12.1	830.2	807.0[2]	807.3[2]	0.3
I	6,480	364	4,240	6.5	830.2	811.7[2]	812.2[2]	0.5
J	7,290	273	1,730	9.1	830.2	813.5[2]	814.2[2]	0.7
K	8,330	183	1,550	10.1	830.2	818.6[2]	818.6[2]	0.0
L	9,260	229	1,720	9.1	830.3	823.7[2]	823.8[2]	0.1
M	10,120	182	1,670	9.4	830.4	826.5[2]	826.5[2]	0.0
N	11,140	108	1,080	14.6	831.4	830.0[2]	830.3[2]	0.3
O	12,210	224	1,910	8.2	836.6	836.6	836.8	0.2
P	13,120	156	1,380	11.4	839.2	839.2	839.8	0.6
Q	14,280	332	2,270	6.9	846.8	846.8	847.3	0.5
R	15,420	223	1,860	8.5	851.7	851.7	852.7	1.0
S	16,560	111	1,180	13.3	856.2	856.2	857.1	0.9
T	17,650	149	1,770	8.9	861.8	861.8	862.1	0.3
U	18,750	178	1,610	9.8	865.8	865.8	866.0	0.2
V	19,370	180	1,510	10.4	868.6	868.6	869.4	0.8
W	20,200	218	1,680	7.2	873.3	873.3	873.7	0.4
X	20,290	222	1,650	7.3	875.3	875.3	875.3	0.0
Y	21,010	287	1,740	6.9	875.5	875.5	875.9	0.4

[1] Feet Above Confluence with Rogue River [2] Elevation Computed without Consideration of Backwater from Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JUMPOFF JOE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Jumpoff Joe Creek (continued)								
Z	22,060	280	1,670	7.2	879.0	879.0	879.3	0.3
AA	23,150	208	1,260	9.5	883.6	883.6	883.6	0.0
AB	24,220	280	1,590	7.6	888.6	888.6	888.9	0.3
AC	25,150	100	718	16.7	894.2	894.2	894.2	0.0
AD	26,500	176	995	7.7	903.5	903.5	903.6	0.1
AE	26,580	190	974	7.9	905.0	905.0	905.0	0.0
AF	27,100	146	738	10.4	907.4	907.4	907.7	0.3
AG	27,660	159	864	8.9	912.3	912.3	912.3	0.0
AH	28,570	130	790	9.7	917.1	917.1	917.1	0.0
AI	29,300	264	1,070	7.2	921.7	921.7	921.8	0.1
AJ	30,140	259	978	7.9	926.9	926.9	927.3	0.4
AK	30,580	452	1,460	5.3	930.7	930.7	930.7	0.0
AL	31,350	346	964	8.0	934.9	934.9	935.2	0.3
AM	32,160	83	604	12.7	940.8	940.8	940.8	0.0
AN	32,280	83	629	12.2	941.8	941.8	942.0	0.2
AO	33,130	153	915	8.4	947.5	947.5	947.6	0.1
AP	33,860	181	797	8.2	950.8	950.8	950.9	0.1
AQ	35,070	207	717	9.1	959.2	959.2	959.2	0.0
AR	36,120	205	825	7.9	966.4	966.4	967.2	0.8
AS	36,590	175	956	6.8	968.5	968.5	969.5	1.0
AT	37,100	184	709	9.2	973.2	973.2	973.2	0.0
AU	37,580	164	894	7.3	977.7	977.7	978.7	1.0
AV	37,970	69	488	13.4	979.7	979.7	979.9	0.2
AW	39,050	200	915	7.2	989.2	989.2	989.6	0.4

[1] Feet Above Confluence with Rogue River

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Jumpoff Joe Creek (continued)								
AX	39,544	103	654	10.0	991.7	991.7	992.6	0.9
AY	39,890	75	528	12.4	993.8	993.8	994.5	0.7
AZ	40,660	86	604	10.8	1,000.1	1,000.1	1,000.1	0.0
BA	41,480	60	460	14.2	1,004.4	1,004.4	1,004.4	0.0

[1] Feet Above Confluence with Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

JUMPOFF JOE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Louse Creek								
A	980	90	307	13.7	905.4	905.4	905.4	0.0
B	1,060	110	530	7.9	908.1	908.1	908.1	0.0
C	1,480	130	465	9.0	909.7	909.7	909.7	0.0
D	1,880	75	356	11.8	914.0	914.0	914.0	0.0
E	2,280	63	361	11.7	918.9	918.9	918.9	0.0
F	2,340	64	380	11.1	919.6	919.6	919.6	0.0
G	3,050	76	354	11.9	927.0	927.0	927.0	0.0
H	3,690	98	585	7.2	932.4	932.4	932.4	0.0
I	4,070	98	377	11.2	935.6	935.6	935.6	0.0
J	4,450	81	397	10.6	940.1	940.1	940.1	0.0
K	5,060	90	485	8.7	945.0	945.0	945.0	0.0
L	6,310	200	558	7.5	954.1	954.1	954.1	0.0
M	6,520	114	398	10.6	958.1	958.1	958.1	0.0
N	6,720	129	416	10.1	962.1	962.1	962.1	0.0
O	7,220	155	439	9.6	967.0	967.0	967.0	0.0
P	7,710	113	395	10.7	975.4	975.4	975.4	0.0
Q	8,500	92	408	10.3	983.3	983.3	983.3	0.0
R	9,260	114	376	11.2	992.4	992.4	992.4	0.0
S	9,970	71	427	9.9	1,000.0	1,000.0	1,000.0	0.0
T	10,020	80	352	12.0	1,003.4	1,003.4	1,003.4	0.0
U	10,420	78	350	12.0	1,006.1	1,106.1	1,106.1	0.0
V	10,760	72	516	8.2	1,009.6	1,009.6	1,009.6	0.0
W	11,280	96	376	11.2	1,012.5	1,012.5	1,012.5	0.0
X	11,750	143	536	7.9	1,017.5	1,017.5	1,017.5	0.0
Y	11,280	175	463	9.1	1,023.4	1,023.4	1,023.4	0.0

[1] Feet Above Confluence with Jumpoff Joe Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

LOUSE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Louse Creek (continued)								
Z	12,840	195	600	7.0	1,030.8	1,030.8	1,030.8	0.0
AA	13,580	110	400	10.5	1,039.0	1,039.0	1,039.0	0.0
AB	14,000	135	446	9.4	1,044.4	1,044.4	1,044.4	0.0
AC	14,450	135	393	10.7	1,051.8	1,051.8	1,051.8	0.0
AD	14,860	150	450	9.4	1,055.8	1,055.8	1,055.8	0.0
AE	15,290	145	410	10.3	1,059.7	1,059.7	1,059.7	0.0
AF	15,680	150	580	7.2	1,064.1	1,064.1	1,064.1	0.0
AG	16,200	120	443	9.5	1,070.4	1,070.4	1,070.4	0.0
AH	16,640	105	550	6.4	1,076.3	1,076.3	1,076.3	0.0
AI	17,010	85	324	10.9	1,081.0	1,081.0	1,081.0	0.0
AJ	17,350	65	407	8.7	1,085.0	1,085.0	1,085.0	0.0
AK	17,800	95	310	11.4	1,090.2	1,090.2	1,090.2	0.0
AL	18,110	95	463	7.6	1,094.4	1,094.4	1,094.4	0.0
AM	18,560	105	385	10.5	1,099.0	1,099.0	1,099.0	0.0
AN	18,910	105	440	8.0	1,105.9	1,105.9	1,105.9	0.0
AO	19,330	173	481	7.3	1,111.0	1,111.0	1,111.0	0.0
AP	19,762	81	317	11.1	1,117.7	1,117.7	1,117.8	0.1
AQ	20,176	200	452	7.8	1,124.7	1,124.7	1,125.3	0.6
AR	20,542	90	358	9.9	1,128.3	1,128.3	1,128.5	0.2
AS	20,822	105	387	9.1	1,132.0	1,132.0	1,132.0	0.0
AT	21,384	54	299	11.8	1,137.9	1,137.9	1,137.9	0.0
AU	21,570	43	254	13.9	1,139.9	1,139.9	1,139.9	0.0
AV	21,698	55	338	10.4	1,142.4	1,142.4	1,142.5	0.1
AW	21,857	73	403	8.8	1,145.5	1,145.5	1,145.5	0.0
AX	22,842	61	297	11.9	1,154.6	1,154.6	1,154.6	0.0

[1] Feet Above Confluence with Jumpoff Joe Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

LOUSE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Louse Creek (continued)								
AY	24,012	229	482	7.3	1,173.1	1,173.1	1,173.1	0.0
AZ	24,680	28	220	16.0	1,184.5	1,184.5	1,184.5	0.0
BA	24,734	59	576	6.1	1,189.2	1,189.2	1,189.2	0.0
BB	25,520	60	263	12.0	1,196.0	1,196.0	1,196.0	0.0
BC	26,504	84	315	10.0	1,211.5	1,211.5	1,211.5	0.0
BD	26,901	88	301	10.5	1,218.4	1,218.4	1,218.4	0.0
BE	27,695	101	312	10.1	1,233.9	1,233.9	1,233.9	0.0
BF	28,652	109	370	8.5	1,246.9	1,246.9	1,247.2	0.3
BG	29,914	89	308	10.3	1,267.2	1,267.2	1,267.2	0.0
BH	30,514	92	303	10.4	1,277.9	1,277.9	1,277.9	0.0
BI	31,604	61	264	12.0	1,298.5	1,298.5	1,298.5	0.0
BJ	32,290	105	344	9.2	1,311.2	1,311.2	1,311.4	0.2
BK	32,737	47	243	12.0	1,319.2	1,319.2	1,319.2	0.0
BL	33,842	59	262	12.1	1,344.7	1,344.7	1,344.7	0.0
BM	34,556	38	228	13.8	1,362.5	1,362.5	1,362.5	0.0
BN	34,671	50	397	8.0	1,365.6	1,365.6	1,365.6	0.0

[1] Feet Above Confluence with Jumpoff Joe Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

LOUSE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Rogue River								
BU	100,000	1,360	33,500	7.1	873.4	873.4	873.4	0.0
BV	100,620	1,950	51,900	4.5	874.0	874.0	874.2	0.2
BW	101,640	2,435	51,600	4.8	874.2	874.2	874.3	0.1
BX	102,550	2,645	53,000	4.5	874.3	874.3	874.5	0.2
BY	103,330	2,890	53,400	4.4	874.6	874.6	874.8	0.2
BZ	104,330	3,735	63,300	3.7	874.8	874.8	875.0	0.2
CA	107,190	3,740	38,200	3.8	875.3	875.3	875.6	0.3
CB	108,560	3,285	33,900	4.3	875.7	875.7	876.1	0.4
CC	110,020	2,325	22,900	6.3	876.2	876.2	876.7	0.5
CD	111,810	2,245	13,200	10.9	877.7	877.7	877.9	0.2
CE	113,920	2,765	15,200	9.5	881.0	881.0	881.9	0.9
CF	115,720	3,130	17,400	8.3	885.2	885.2	885.5	0.3
CG	117,380	3,300	18,600	7.8	886.7	886.7	887.5	0.8
CH	119,420	2,940	19,400	7.4	889.9	889.9	890.2	0.3
CI	120,960	2,550	18,524	7.8	891.6	891.6	891.9	0.3
CJ	122,980	678	10,673	13.5	892.4	892.4	893.3	0.9
CK	124,632	1,047	12,004	12.0	894.8	894.8	895.7	0.9
CL	126,679	652	12,130	11.9	898.6	898.6	899.2	0.6
CM	128,409	618	10,818	13.3	901.4	901.4	902.0	0.6
CN	130,769	1,838	14,496	9.9	904.8	904.8	905.6	0.8
CO	132,049	731	13,932	10.3	908.0	908.0	908.6	0.6
CP	133,969	742	12,196	11.8	910.1	910.1	911.0	0.9
CQ	135,269	762	16,068	9.0	912.9	912.9	913.9	1.0
CR	136,563	554	14,475	9.9	913.9	913.9	914.9	1.0
CS	137,875	555	13,364	10.8	914.9	914.9	915.9	1.0

[1] Feet Above Confluence with Maple Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

ROGUE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Rogue River (continued)								
CT	139,268	414	10,741	13.4	916.0	916.0	917.0	1.0
CU	139,678	489	11,859	12.1	917.0	917.0	918.0	1.0
CV	140,369	497	11,036	13.0	917.7	917.7	918.6	0.9
CW	140,723	456	10,852	13.3	918.2	918.2	919.0	0.8
CX	142,668	602	16,008	9.0	922.1	922.1	922.6	0.5
CY	143,906	774	15,556	9.3	923.7	923.7	924.2	0.5
CZ	145,944	502	13,740	10.5	925.4	925.4	925.8	0.4
DA	146,970	386	12,059	11.9	926.2	926.2	926.5	0.3
DB	147,963	541	11,192	12.9	926.8	926.8	927.3	0.5
DC	148,960	548	12,261	11.7	928.9	928.9	929.4	0.5
DD	150,969	550	12,253	11.8	931.4	931.4	931.7	0.3
DE	152,110	510	12,100	11.9	933.1	933.1	933.2	0.1
DF	152,960	327	9,620	14.8	933.9	933.9	933.9	0.0
DG	154,090	375	10,200	14.0	936.1	936.1	936.1	0.0
DH	155,160	415	10,700	13.3	937.4	937.4	937.8	0.4
DI	157,280	431	12,300	11.5	941.1	941.1	941.6	0.5
DJ	158,250	417	11,800	12.1	942.7	942.7	942.8	0.1
DK	158,570	440	12,700	11.2	943.5	943.5	943.7	0.2
DL	159,760	363	10,800	13.1	945.0	945.0	945.4	0.4
DM	161,770	548	15,900	8.9	949.0	949.0	949.3	0.3
DN	162,840	344	8,050	17.7	949.2	949.2	949.5	0.3
DO	164,330	455	10,700	13.3	956.2	956.2	956.2	0.0
DP	166,480	426	12,100	11.8	961.0	961.0	961.0	0.0
DQ	168,240	500	12,600	11.3	964.1	964.1	964.1	0.0
DR	169,200	403	9,460	15.0	964.7	964.7	964.7	0.0
DS	170,800	460	13,000	10.9	970.0	970.0	970.6	0.6

[1] Feet Above Confluence with Maple Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

ROGUE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Slate Creek								
A	2,400	450[2]	1,950	4.6	910.3	905.7[3]	906.3[3]	0.6
B	3,170	454[2]	1,855	4.8	910.8	907.0[3]	907.5[3]	0.5
C	3,960	624[2]	2,160	4.1	911.4	909.0[3]	909.0[3]	0.0
D	4,960	713	2,780	3.2	912.8	912.2[3]	912.2[3]	0.0
E	5,880	132	891	10.0	916.7	916.7	916.7	0.0
F	6,650	264	1,390	6.4	920.3	920.3	920.5	0.2
G	7,270	250	1,410	6.3	922.1	922.1	922.7	0.6
H	7,400	250	1,790	5.0	926.0	926.0	926.0	0.0
I	8,060	376	1,720	4.7	926.8	926.8	927.1	0.3
J	9,140	101	778	10.4	929.2	929.2	930.1	0.9
K	9,900	102	736	11.0	934.2	934.2	934.9	0.7
L	11,120	155	1,200	6.8	941.8	941.8	941.8	0.0
M	11,790	173	1,000	8.1	943.8	943.8	944.0	0.2
N	12,590	84	730	11.1	947.7	947.7	948.0	0.3
O	13,430	100	943	8.6	951.9	951.9	952.9	1.0
P	14,360	120	993	8.2	956.1	956.1	956.9	0.8
Q	15,010	84	895	9.0	959.3	959.3	960.2	0.9
R	15,790	84	561	14.4	967.9	967.9	968.6	0.7
S	16,710	123	1,030	7.9	977.9	977.9	978.6	0.7

[1] Feet Above Confluence with Applegate River [2] Floodway Lies Entirely within Applegate River Floodway [3] Elevation Computed without Consideration of Backwater from Applegate River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

SLATE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Waters Creek								
A	230	58	465	3.6	1,096.2	1,096.2	1,096.2	0.0
B	840	40	184	9.2	1,097.2	1,097.2	1,097.7	0.5
C	1,742	64	346	4.9	1,106.1	1,106.1	1,106.1	0.0
D	2,103	47	192	8.8	1,106.5	1,106.5	1,107.1	0.6
E	2,348	44	265	6.4	1,111.7	1,111.7	1,111.7	0.0
F	2,731	33	265	6.4	1,115.2	1,115.2	1,115.7	0.5
G	2,866	35	219	6.0	1,115.5	1,115.5	1,116.5	1.0
H	3,163	30	117	11.3	1,118.7	1,118.7	1,118.7	0.0
I	3,387	57	263	5.0	1,122.4	1,122.4	1,122.4	0.0
J	3,671	43	166	7.9	1,122.5	1,122.5	1,122.8	0.3
K	4,587	36	125	10.6	1,133.3	1,133.3	1,133.3	1.0
L	4,961	41	238	5.5	1,140.5	1,140.5	1,140.7	0.2
M	5,148	80	361	3.7	1,143.4	1,143.4	1,144.1	0.7
N	5,336	50	310	4.3	1,145.1	1,145.1	1,145.2	0.1
O	5,597	33	148	8.9	1,145.0	1,145.0	1,145.5	0.5
P	5,852	38	147	9.0	1,147.3	1,147.3	1,147.4	0.1
Q	6,112	37	138	9.6	1,150.6	1,150.6	1,150.6	0.0
R	6,200	28	155	8.5	1,153.1	1,153.1	1,153.1	0.0

[1] Feet Above Confluence with Slate Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

WATERS CREEK

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to the community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Table 7 lists the flood insurance zones that each community is responsible for regulating.

Table 7. Flood Insurance Zones Within Each Community

Community	Flood Zone(s)
Cave Junction, City of	AE, X
Grants Pass, City of	AE, X
Josephine County, Unincorporated Areas	A, AE, X, D

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide Flood Insurance Rate Map presents flooding information for the entire geographic area of Josephine County. Previously, Flood Insurance Rate Maps were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide Flood Insurance Rate Map also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 8, "Community Map History."

7.0 OTHER STUDIES

In December 1965, the U.S Army Corps of Engineers published a Flood Plain Information report which described the flooding in Josephine County during the 1964 flood (Reference 29). Flood boundaries for the 1964 flood, and estimated boundaries for the 1861 flood were shown on aerial photographs. No profiles were presented.

In July 1966, the U.S. Army Corps of Engineers published a statewide Post Flood Report describing the floods that had occurred in December 1964 and January 1965 (Reference 10). A discussion of flooding from streams within Josephine County included graphic displays of cumulative precipitation and storm hydrographs.

In November 1970, USGS published a profile study for the Rogue River in a reach extending from the Grants Pass gaging station to the Lost Creek for the 1964 flood and for the 10- and 20-year floods, based on hydrology considered to be effective at that time. Also presented were cross sections and channel plan views. Profile concurrence for the design floods was not attempted because of significant changes in the hydrologic analyses due to revised flood-control estimates.

Also present were cross sections and channel plan views. Profile concurrence for the design floods was not attempted because of significant changes in the hydrologic analyses due to revised flood-control estimates.

In July 1971, the U.S. Geological Survey prepared a Flood Insurance Study for Josephine County (Reference 30). The report presented base flood elevations and estimated flood boundaries which were shown on enlarged portions of 10-minute quadrangles having 80-foot contour intervals. Flood profiles for the 500-, 100-, and 10-year floods were based on the same hydrology used in the previously described Profile Study (Reference 31). The Type-10 study did not include the incorporated area of Grants Pass.

In July 1975, the U.S. Army Corps of Engineers published a statewide Post Flood Report describing floods that had occurred in January 1974 (Reference 12). A discussion of flood magnitudes and storm damage was similar to their report issued after the 1964 floods in Oregon.

A Flood Insurance Studies have been published for the unincorporated areas of Jackson County (Reference 1 and 32). The hydrologic analysis used in the Grants Pass study is consistent with the analysis used in the Jackson County study.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Cave Junction, City of	June 1, 1982	----	June 1, 1982	----
Grants Pass, City of	March 22, 1974	November 5, 1976	April 15, 1981	September 27, 1991
Unincorporated Areas	August 16, 1977	----	June 1, 1982	December 1, 1983 September 27, 1991

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

Flood Studies were prepared for the incorporated area of Cave Junction (Reference 33), and for the incorporated area of Grants Pass (Reference 34). All data presented in these studies agree exactly with data presented herein.

In November 1974, a Flood Hazard Boundary Map was published for Cave Junction (Reference 35). This Flood Insurance Study is more detailed and, thus, supersedes that map.

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Mitigation Division, Federal Regional Center, 130 228th Street, SW, Bothell, Washington 98021-9796.

9.0 BIBLIOGRAPHY AND REFERENCES

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11. U.S. Department of the Army, Corps of Engineers, Portland District, Cumulative Frequency Curve – Maximum Annual Discharge, Rogue River at Grants Pass, Portland, Oregon, 1976 and 1978

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24. H.W. and E.F. Brater, Handbook of Hydraulics, 4th Edition, New York: McGraw-Hill Book Company, 1954

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Map Name	Date	Scale	Contour Interval
Applegate	1983	1:24,000	40 ft
Buckskin Peak	1989	1:24,000	40 ft
Bunker Creek	1989	1:24,000	40 ft
Cave Junction	1989	1:24,000	40 ft
Eight Dollar Mountain	1989	1:24,000	40 ft
Galice	1989	1:24,000	40 ft
Glendale	1986	1:24,000	40 ft
Golden	1986	1:24,000	40 ft
Grants Pass	1986	1:24,000	40 ft
Holland	1989	1:24,000	40 ft
Kelsey Peak	1989	1:24,000	40 ft
Kerby Peak	1986	1:24,000	40 ft
King Mountain	1983	1:24,000	40 ft
Merlin	1986	1:24,000	40 ft
Mount Reuben	1989	1:24,000	40 ft
Murphy	1986	1:24,000	40 ft
Murphy Mountain	1986	1:24,000	40 ft
O'Brien	1989	1:24,000	40 ft
Onion Mountain	1989	1:24,000	40 ft
Rogue River	1983	1:24,000	40 ft
Selma	1989	1:24,000	40 ft
Sexton Mountain	1986	1:24,000	40 ft
Takilma	1989	1:24,000	40 ft
Wilderville	1986	1:24,000	20 ft

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34. Federal Emergency Management Agency, Flood Insurance Study, City of Grants Pass, Oregon, November 1980.

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10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original Flood Insurance Study was printed. Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To assure that any user is aware of all revisions, it is advisable to contact the community repository for your community.

All previous study revision descriptions have been incorporated into the appropriate sections of this FIS. Table 9 summarizes the flooding sources updated since the original study was completed.

Table 9. Revised Study Descriptions

Flooding Source	Community	Limits of Study	Revision Date	Panel Number(s)
Rogue River	Josephine County Unincorporated Areas and the City of Grants Pass	From approximately 3.5 miles downstream to 2.2 miles upstream of the South 6th Street bridge	September 19, 1990	0484, 0492, 0503, 0511, 0512, and 0516
Rogue River	Josephine County Unincorporated Areas and the City of Grants Pass	From approximately 5.2 miles downstream to 3.5 miles upstream of the South 6th Street bridge	November 2008	0491, 0492, 0503, 0511, 0512, 0516, 0517
Louse Creek	Josephine County Unincorporated Areas	From approximately 470 feet downstream of Monument Drive to Granite Hill Road	September 19, 1990	0314, 0501, and 0502
Applegate River	Josephine County Unincorporated Areas	From the upstream end of the initial analysis to the Josephine-Jackson County line	September 19, 1990	0708, 0710, 0720, 0740, and 0750
Waters Creek	Josephine County Unincorporated Areas	From its confluence with Slate Creek upstream approximately 1 mile	September 19, 1990	0656
Gilbert Creek	City of Grants Pass	From SW Rogue River Avenue to just upstream of NW Windsor Drive	November 2008	0504

Countywide Update (December 3, 2009)

The countywide update was completed in November 2008 by WEST Consultants, Inc. for FEMA under Contract No. EMS-2001-CO-0068.

This update combined the Flood Insurance Rate Maps and Flood Insurance Study reports for Josephine County and incorporated communities into the countywide format. Under the countywide format, FIRM panels have been produced using a single layout format for the entire area within the county instead of separate layout formats for each community. The single-layout format facilitates the matching of adjacent panels and depicts the flood-hazard area within the entire panel border, even in areas beyond a community's corporate boundary line. In addition, under the countywide format this single FIS report provides all associated information and data for the entire county area.

As part of this revision, the format of the map panels has changed. Previously, flood-hazard information was shown on both FIRMs and Flood Boundary and Floodway Maps (FBFMs). In the new format, all base flood elevations, cross sections, zone designations, and floodplain and floodway boundary delineations are shown on the FIRM; the FBFM has been eliminated. Some of the flood insurance zone designations were changed to reflect the new format. Areas previously shown as numbered Zone A were changed to Zone AE. Areas previously shown as Zone B were changed to Zone X (shaded). Areas previously shown as Zone C were changed to Zone X (unshaded). In addition, all Flood Insurance Zone Data Tables were removed from the FIS report and all zone designations and reach determinations were removed from the profile panels.

All flood elevations shown in this FIS report and on the FIRM panels were converted from NGVD 29 to NAVD 88. The conversion factor from NGVD to NAVD for all streams in this report is +3.36 feet.

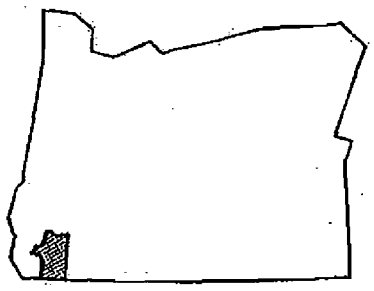
The 1- and 0.2-percent-annual-chance floods were redelineated on Gilbert Creek and portions of the Rogue River using new topography with a one-foot contour interval provided by the City of Grants Pass (Reference 26). The cross section locations were digitized from the effective Floodway panels or work maps. Elevations used for the redelineation were taken from the effective floodway data tables and adjusted to the NAVD88 vertical datum. The redelineation along Gilbert Creek extended from SW Rogue River Avenue to just upstream of NW Windsor Drive, a distance of approximately 2.5 miles. Redelineation along the Rogue River extended from approximately river station 111,810 (cross section CD) to river station 158,250 (cross section DJ).

The floodplain boundaries for all other flooding sources were digitized from the effective FIRM and Floodway panels. Aerial photography (Reference 25) and USGS 7.5' Quadrangles (Reference 24) were used to adjust floodplain and floodway boundaries where appropriate.

COMPLETE REPORT LOCATED IN PLANNING FILE

FLOOD INSURANCE STUDY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS VOLUME 2 OF 2



COMMUNITY NAME	COMMUNITY NUMBER
CAVE JUNCTION, CITY OF	410107
GRANTS PASS, CITY OF	410108
JOSEPHINE COUNTY UNINCORPORATED AREAS	415590

Effective:
December 3, 2009

PROOF COPY

Federal Emergency Management Agency
Flood Insurance Study Number
41033CV002A

COMPLETE REPORT LOCATED IN PLANNING FILE

PROOF
COPY

NATIONAL FLOOD INSURANCE PROGRAM

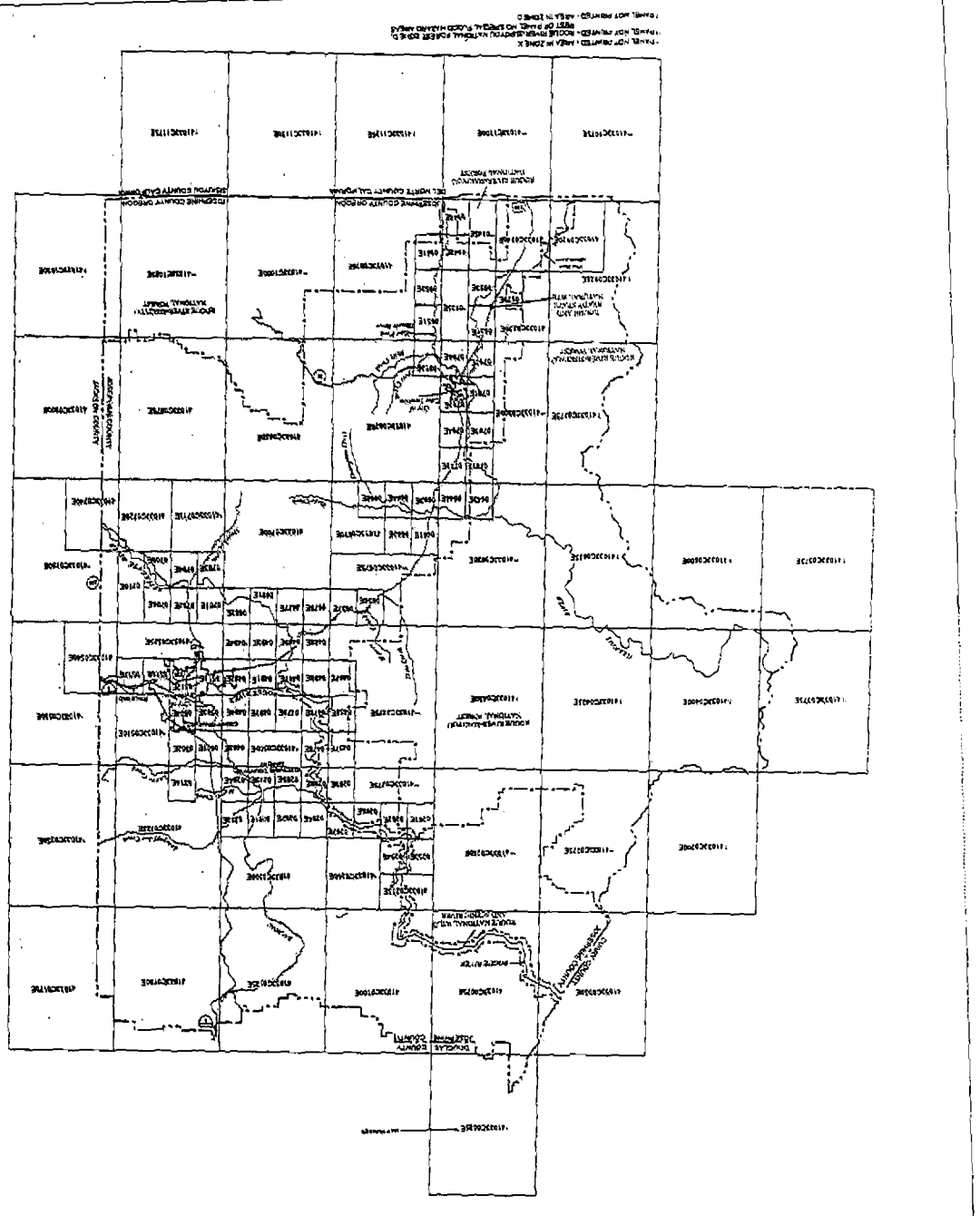
NFIP

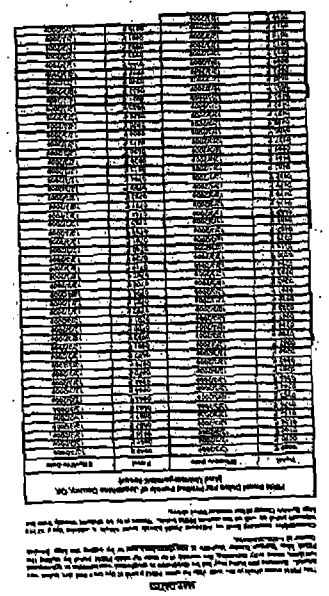
FIRM
FLOOD INSURANCE RATE MAP

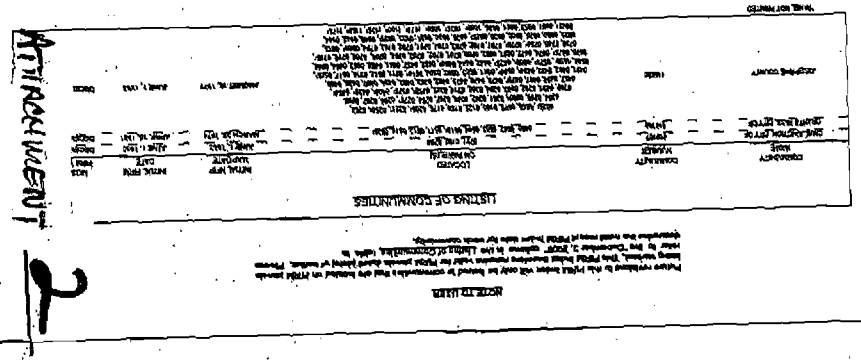
JOSEPHINE COUNTY,
OREGON
AND INCORPORATED AREAS

MAP INDEX

MAP NUMBER
41033CINDXA
EFFECTIVE DATE:
DECEMBER 7, 2018







ATTACHMENT 2

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Oregon State Plane South Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (2008), Oregon Water Resources Department (2008), ORAM Bureau of Land Management (2000), U.S. Fish and Wildlife Service (2008), Oregon Parks and Recreation Department (2008), and National Geodetic Survey (2007) at a scale of 1:24,000.

The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

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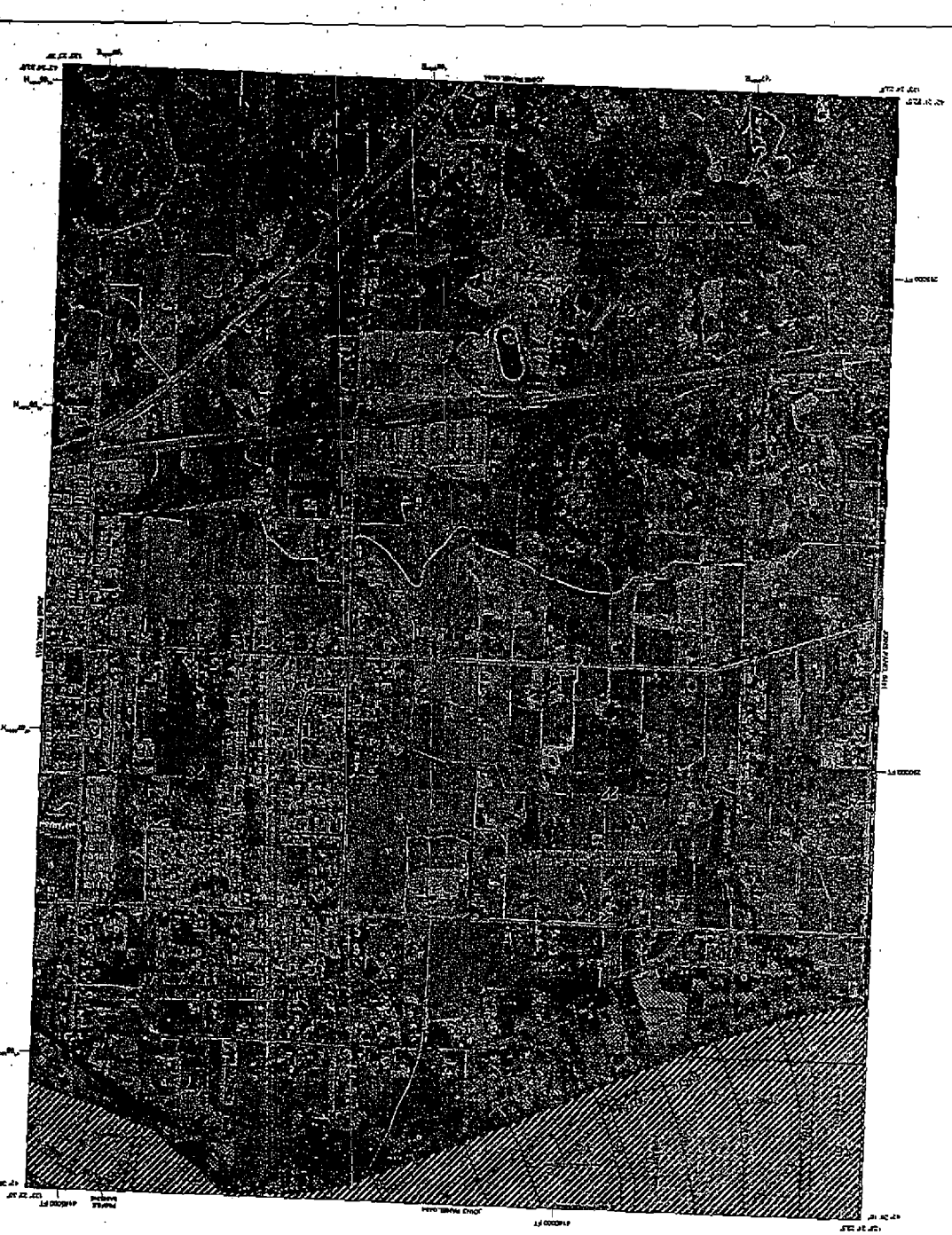
Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.



LEGEND

▨ SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

▨ FLOODWAY AREAS IN ZONE AE

▨ OTHER FLOOD AREAS

☐ OTHER AREAS

▨ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▨ OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 500'

PANEL 0462E

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

PROOF
COPY

MAP NUMBER
41033C0462E

EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

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Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be converted to other vertical datums for use in surveying and engineering purposes. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

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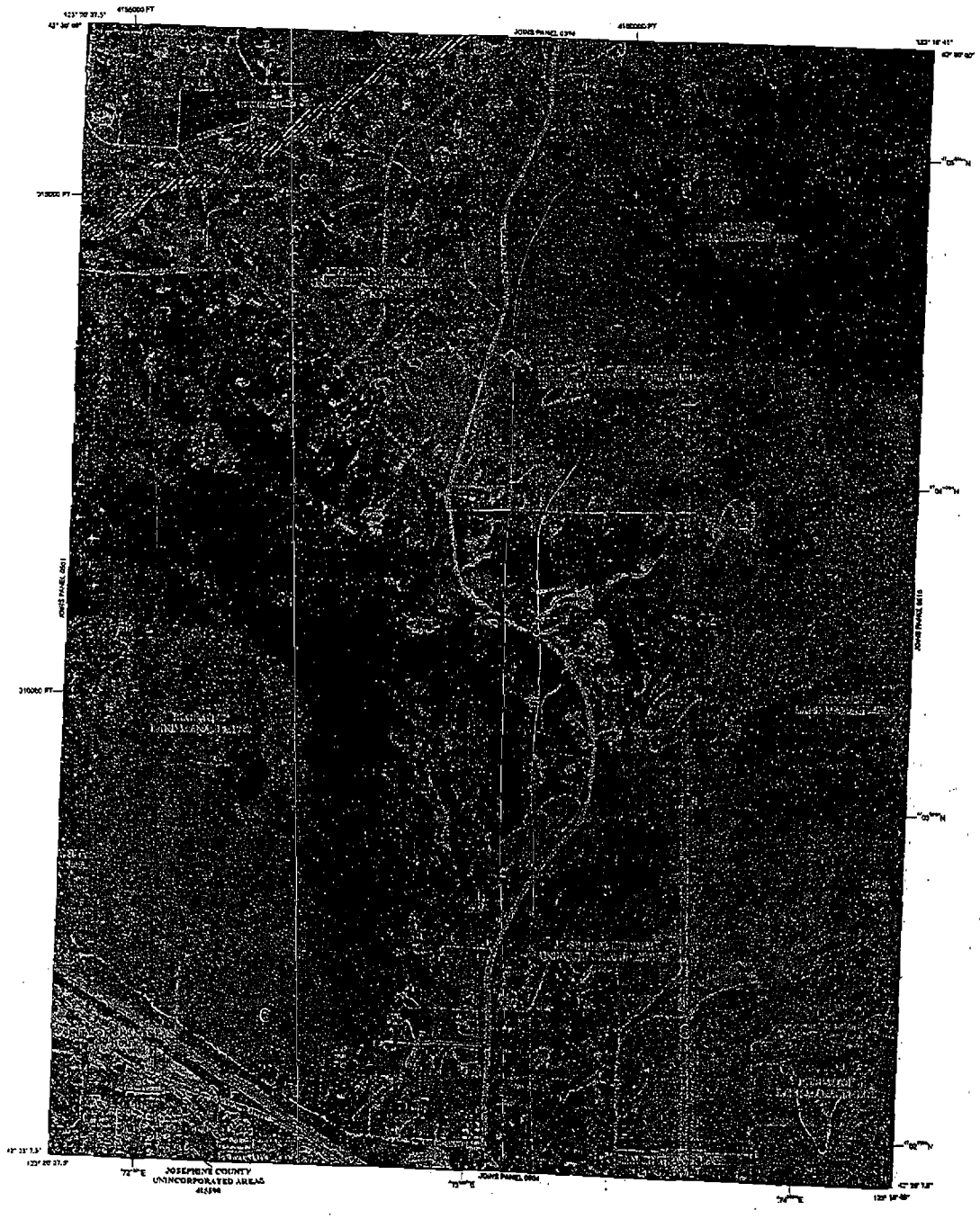


LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (base flood) is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE U — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and units are designated as [select one]

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A) — (A) Cross section line
- (23) — (23) Transect line
- 97° 07' 30", 32° 22' 30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 FT — Flight line and coordinate number
- 1000-meter Universal Transverse Mercator grid values, zone 10S
- 5000-foot grid ticks: Oregon State Plane South zone (FIPS zone 3602), Lambert Conformal Conic projection
- DX5510 X — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

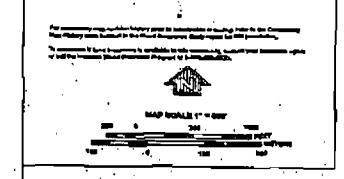
MAP REPOSITORY
Refer to Map Repository list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
DECEMBER 3, 2008

EFFECTIVE DATES OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NFIP

PANEL 0602E

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

PANEL 602 OF 1175

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410134	0602	E
JOSEPHINE COUNTY	130024	0602	E

PROOF COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0602E
EFFECTIVE DATE
DECEMBER 3, 2008

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was State Plane Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at [illegible] or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-[illegible]
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at [illegible].

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (2006), Oregon Water Resources Department (2009), ORBAM Bureau of Land Management (2002), U.S. Fish and Wildlife Service (2008), Oregon Parks and Recreation Department (2006), and National Geodetic Survey (2007) at a scale of 1:24,000.

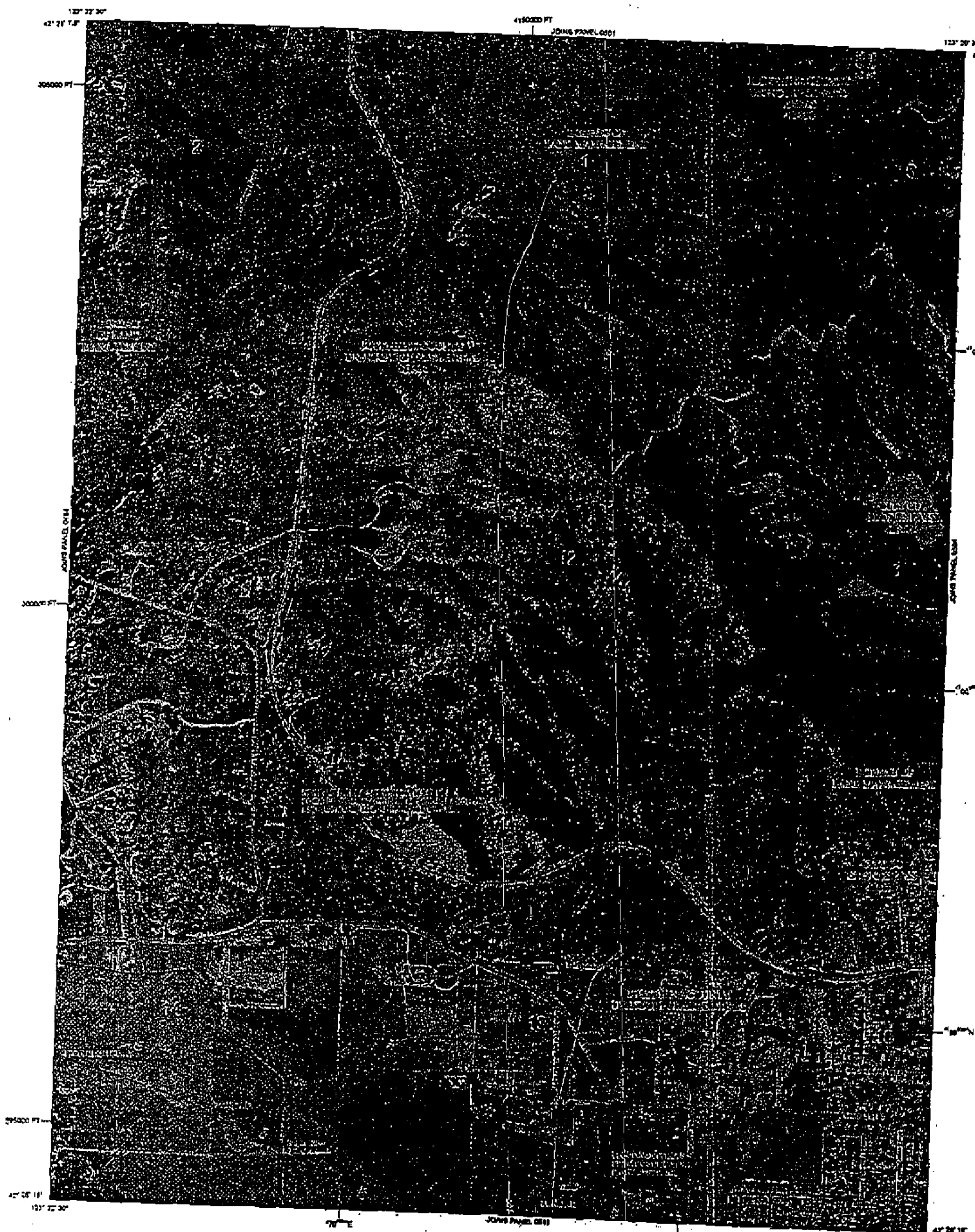
The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL [illegible]

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON

AND INCORPORATED AREAS

PROOF COPY

MAP NUMBER 41033C0503E

EFFECTIVE DATE DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was State Plane Zone 3601 (FIPS zone 3601). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map data were provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (JOSE), Oregon Water Resources Department (OWRD), ORMAP Registry of Land Information Systems (ORMAP), U.S. Fish and Wildlife Service (USFWS), Oregon State and Plan Region Department (OSDP), and Jones & Stokes, Inc. (2007) at a scale of 1:24,000.

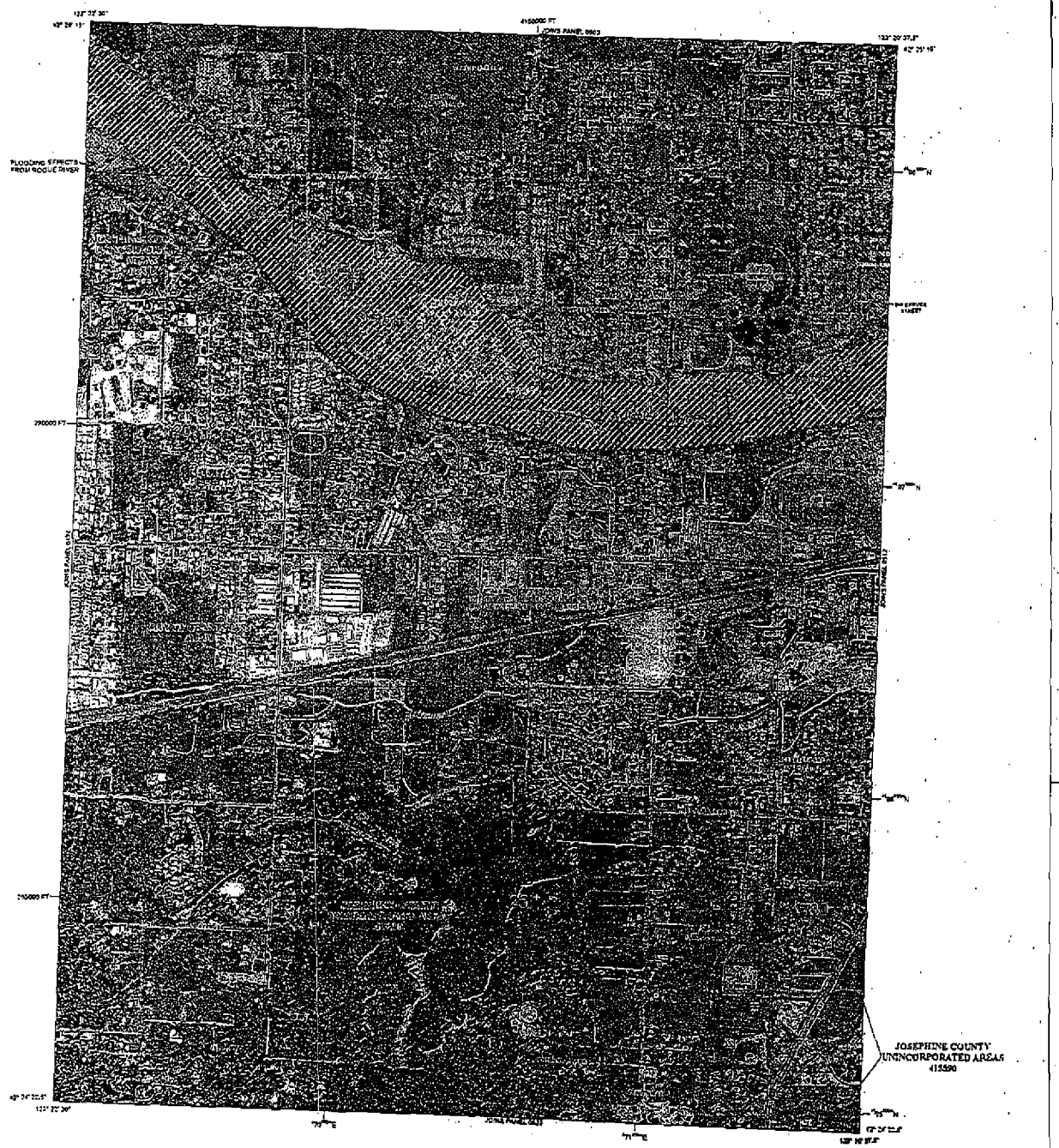
The profile baselines depicted on this map represent the hydraulic modeling baselines that match the floodways shown in the FIS report. As a result of improved topographic data, the stream baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHAs.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of communities inside and outside the SFHAs for which Flood Insurance Rate Maps have been produced for the area and the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (base flood) is also known as the 100-year flood. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A1-A30, AR, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually shallow flooding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundaries dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

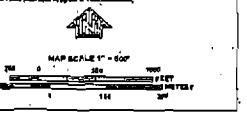
- (A) — Cross section line
- (23) — Transect line
- 97°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 1000000 FT — 1000-meter Universal Transverse Mercator grid values, zone 10N
- 5000 FT — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- MP — River Mile

* National Geodetic Vertical Datum of 1929

Refer to the Map Index for more information on the current datum for this FIRM.

EFFECTIVE DATE OF COMMUNITY FLOOD HAZARD MAP
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For communities/areas participating in the National Flood Insurance Program, the current effective Map Number and Effective Date can be obtained by calling the Map Assistance Center at 1-800-358-9616.



NFIP — NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0911E

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

PANEL 911 OF 1775
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410184	0911	E
JOSEPHINE COUNTY	415591	0911	E

PROOF COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0911E
EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The Community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation determination. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross-sections and interpolated between cross-sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Oregon State Plane South Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (1997), Oregon Water Resources Department (2000), Oregon Department of Land Management (2000), U.S. Fish and Wildlife Service (2000), Oregon Parks and Recreation Department (2000), and National Geodetic Survey (2007) at a scale of 1:24,000.

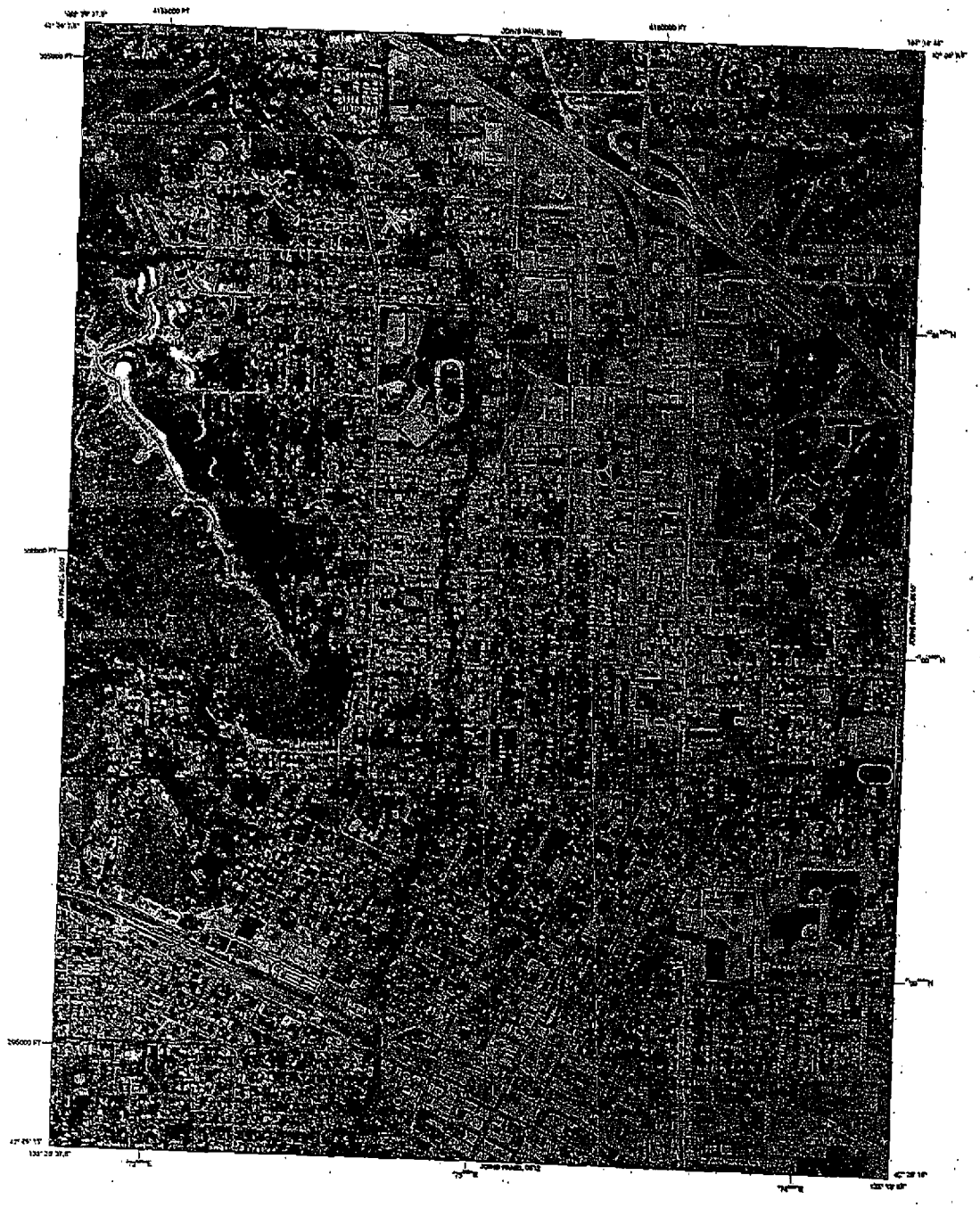
The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of maps, all applicable community NFIP repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may be reached by FAX at 1-800-358-9620 and its website at http://www.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/nfip/inkmap.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to the 1% annual chance flood. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A1-A30, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 — Area to be protected from the 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line

97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4927000 FT — Western Oregon State Plane Grid Tick (NAD 83 Zone 3602), Lambert Conformal Conic projection

1000-meter Universal Transverse Mercator grid values, zone 10T

5000-foot grid ticks: Oregon Coordinate System of 1983 (North Zone)

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORY
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

PANEL 0604E

NFIP — NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

PANEL 604 OF 1175

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410096	0604	E
JOSEPHINE COUNTY	415591	0604	E

PROOF COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0604E
EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Oregon State Plane South Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (2005), Oregon Water Resources Department (2006), ORNHA Bureau of Land Management (2007), U.S. Fish and Wildlife Service (2000), Oregon Parks and Recreation Department (2006), and National Geodetic Survey (2007) at a scale of 1:24,000.

The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

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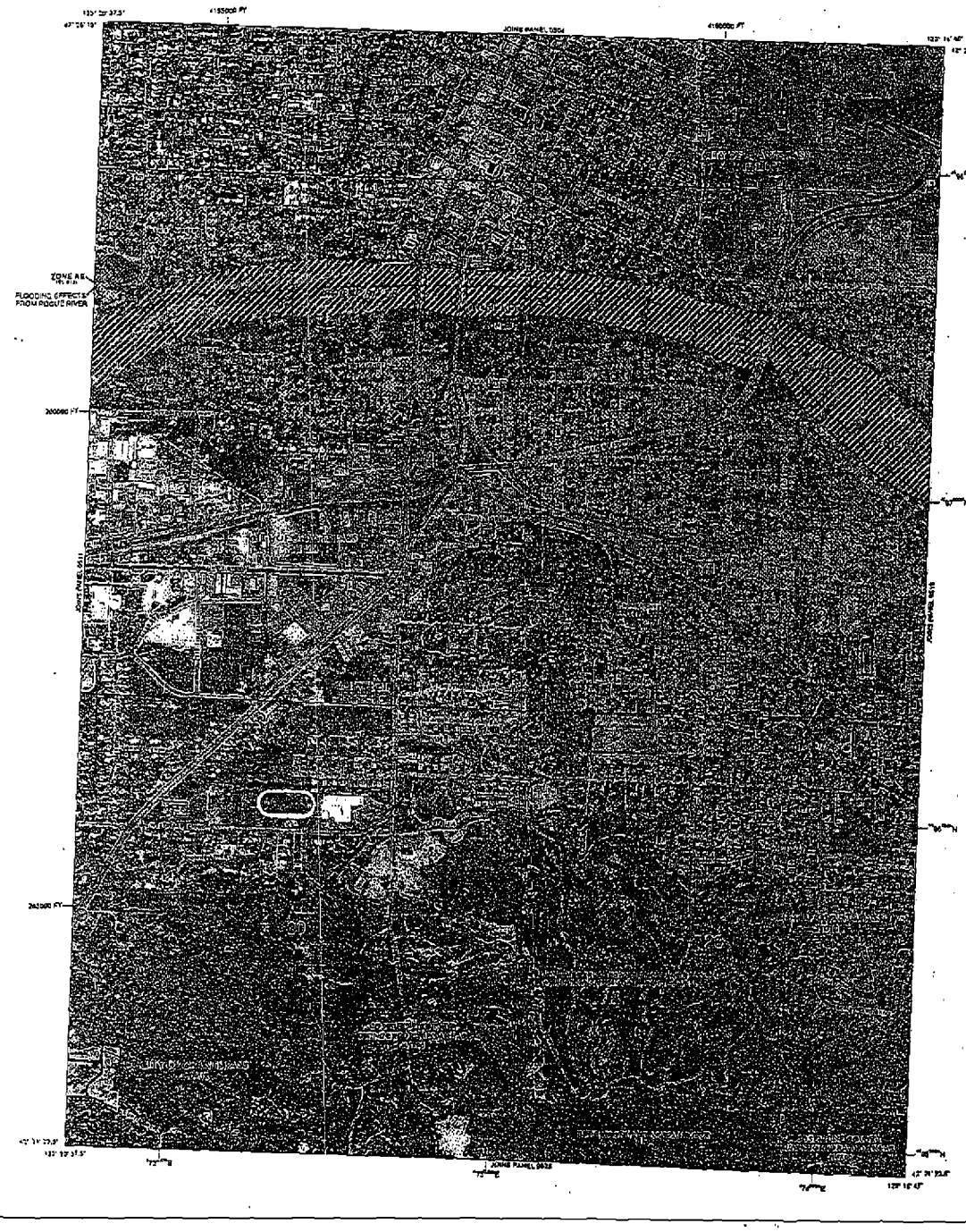
If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

▨ SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

[illegible]

ZONE A	[illegible]
ZONE AE	[illegible]
ZONE AH	[illegible]
ZONE AO	[illegible]
ZONE AR	[illegible]
ZONE A99	[illegible]
ZONE V	[illegible]
ZONE VE	[illegible]

▨ FLOODWAY AREAS IN ZONE AE

[illegible]

▨ OTHER FLOOD AREAS

ZONE X	[illegible]

☐ OTHER AREAS

ZONE X	[illegible]
ZONE D	[illegible]

▨ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▨ OTHERWISE PROTECTED AREAS (OPAs)

[illegible]

MAP SCALE 1" = 500'

PANEL 0512E

FIRM
FLOOD INSURANCE RATE MAP
JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 512 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY	NUMBER	PANEL	SUFFIX
[illegible]	[illegible]	[illegible]	E
JOSEPHINE COUNTY	[illegible]	[illegible]	E

PROOF COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0512E

EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Oregon State Plane South Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in mapping features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were digitized in digital format by Jackson County and the State of Oregon. This information was compiled from Josephine County (2004), Grants Pass Department (2006), Oregon Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (2006), Oregon Parks and Recreation Department (OPRD), and National Geodetic Survey (2007) at a scale of 1:24,000.

The projection used in the preparation of this map was Oregon State Plane South Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in mapping features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baselines in some cases may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of Communities Participating in the National Flood Insurance Program (NFIP) and the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 500'

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0916G

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

PANEL 916 OF 1175

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410033	0916	G
JOSEPHINE COUNTY	415591	0916	G

PROOF COPY

MAP NUMBER
41033C0916G

EFFECTIVE DATE
DECEMBER 3, 2008

Federal Emergency Management Agency

ATTACHMENT 3

Article 13: Special Purpose Districts

13.010 Purpose

The special purpose districts are intended to accommodate development within areas with specific natural, historical, or locational features. The standards herein are intended to mitigate natural hazards, to protect natural or historical features, and/or to mitigate land use conflicts. The special district standards apply in addition to the standards of the underlying zoning district.

[2]13.020 General Provisions

The Special Purpose Districts shall encompass land areas that:

(1) have slopes exceeding 15%.

(2) are located within the boundaries of the 100 year flood plain.

(3) are located in proximity to hospitals and that are appropriate for medical uses.

(4) are recognized as historically significant.

J13.025 Special Purpose District Overlay Map. There shall be an overlay map to the Zoning Map that depicts boundaries of the special districts shown herein. These maps are incorporated into this Section by reference. The special purpose district maps may be amended as provided in Article 4 of this Code. The maps are general in nature. The applicant for a development shall verify the grades on lands or portions of lands that are the subject of any specific application.

13.200 Flood Hazard District

13.210 Authorization, Findings of Fact, Purpose, and Objectives

13.211 Authorization.

The State of Oregon has, in the home rule provisions of the Oregon Constitution, Article XI Section 2, and in ORS 221.410, delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry.

13.212 Findings of Fact.

(1) The flood hazard areas of the City are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.

(2) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately flood-proofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

13.213 Purpose. It is the purpose of the Flood Hazard District to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

(1) To protect human life and health;

(2) To minimize expenditure of public money and costly flood control projects;

(3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) To minimize prolonged business interruptions;

(5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;

(6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;

(7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and

(8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

13.214 Methods of Reducing Flood Losses.

In order to accomplish its purposes, this Article includes methods and provisions for:

(1) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;

(2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(3) Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

(4) Controlling filling, grading, dredging, and other development which may increase flood damage;

(5) Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas; and

(6) Coordinating and supplementing the provisions of the state building cod with local land use and development ordinances.

13.220 Definitions

13.221 Interpretation of Terms. Unless specifically defined below, words or phrases used in this article shall be interpreted so as to give them the meaning they have in common usage and to give this article its most reasonable application. In the event of a conflict between the definitions in this Article and Article 30 of this Code, the definitions in this Article shall apply to the provisions of this Article.

12.222 Definitions

(1) Appeal. "Appeal" means a request for a review of any provision of this Article or a request for a variance.

(2) Area of Shallow Flooding. "Area of shallow flooding" means a designated AO or AH zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.

(3) Area of Special Flood Hazard. "Area of special flood hazard" or "special flood hazard area" (SFHA) means the land in the floodplain within a community subject to a one percent or greater chance of flooding in a given year. Designation on maps always includes the letters A or V.

(4) Base Flood. "Base flood" means the flood having a one percent chance of being equaled or exceeded in any given year. Also referred to as the "100-year flood." Designation on maps always includes the letters A or V.

(5) Basement. "Basement" means any area of the building having its floor subgrade (below ground level) on all sides.

(6) Below-Grade Crawl Space. "Below-grade crawl space" means an enclosed area below the base flood elevation in which the interior grade of the crawlspace is lower than the adjacent exterior grade. (An at-grade crawl-space is one in which they interior grade is at or above the elevation of the exterior grade). For below-grade crawlspaces, these regulations specify that the interior grade is not more than two feet below the lowest adjacent exterior grade, and the height, measured from the interior grade of the crawlspace to the top of the crawlspace foundation, does not exceed 4 feet at any point.

(7) Critical Facility. "Critical facility" means a facility for which even a slight chance of flooding might be too great. Critical facilities include, but are not limited to schools, nursing homes, hospitals, police, fire, and emergency response installations, installations which produce, use or store hazardous materials or hazardous waste.

(8) Development. "Development" means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining,

dredging, filling, grading, paving, excavation or drilling operations located within the area of special flood hazard.

(9) Elevated Building. "Elevated building" means for insurance purposes, a non-basement building which has its lowest elevated floor raised above ground level by foundations walls, shear walls, post, piers, pilings, or columns.

(10) Essential Facility. "Essential facility" has the meaning as defined in the State Building Code.

(11) Existing Manufactured Home Park or Manufactured Home Subdivision. "Existing manufactured home park or manufactured home subdivision" means a manufactured home park or manufactured home subdivision for which the construction of facilities for servicing the lots (in a subdivision) or spaces (in a park) on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the adopted floodplain management regulations.

(12) Expansion to an Existing Manufactured Home Park or Manufactured Home Subdivision. "Expansion to an existing manufactured home park or manufactured home subdivision" means the preparation of additional sites by the construction of facilities for servicing the lots or spaces on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

(13) Flood or Flooding. "Flood" or "flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

(a) The overflow of inland or tidal waters; and/or
(b) The unusual and rapid accumulation of runoff of surface waters from any source.

(14) Flood Insurance Rate Map (FIRM). "Flood Insurance Rate Map (FIRM)" means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

(15) Flood Insurance Study. "Flood Insurance Study" means the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood

Boundary-Floodway Map, and the water surface elevation of the base flood.

(16) Floodway. "Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

(17) Lowest Floor. "Lowest floor" means the lowest floor of the lowest enclosed areas (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered the building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance (provisions for fully enclosed areas below the lowest floor in Section 13.261(2) and for crawlspaces in Section 13.265).

(18) Manufactured Home. "Manufactured home" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

(19) Manufactured Home Park or Manufactured Home Subdivision. "Manufactured Home Park or Manufactured Home Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots or spaces for rent or sale.

(20) New Construction. "New construction" means structures for which the "start of construction" commenced on or after the effective date of adopted floodplain management regulations.

(21) New Manufactured Home Park or Manufactured Home Subdivision. "New manufactured home park or manufactured home subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots or spaces on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of adopted floodplain management regulations.

(22) Recreational Vehicle. "Recreational vehicle" means a vehicle which is:

(a) Built on a single chassis;
(b) 400 square feet or less when measured at the largest horizontal projection;
(c) Designed to be self-propelled or permanently towable by a light duty truck; and
(d) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

(23) Start of Construction. "Start of construction" includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement, or other improvement was within 180 days of the permit date.

The actual start means either the first placement of permanent construction of a structure on a sit, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation.

Permanent construction does not include land preparation, such as clearing grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms,; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

(24) State Building Code. "State Building Code" means the combined specialty codes.

(25) Structure. "Structure" means a walled and roofed building including a gas or liquid storage tank that is principally above ground.

(26) Substantial Damage. "Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

(27) Substantial improvement. "Substantial improvement" means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either:

(a) Before the improvement or repair is started; or

(b) If the structure has been damaged and is being restored, before the damage occurred.

For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

(a) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or

(b) Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

(28) Variance. "Variance" means a grant of relief from the requirements of this Article which permits construction in a manner that would otherwise be prohibited by this Article.

(29) Water Dependent. "Water dependent" means a structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

13.230 General Provisions

13.231 Lands to Which This Article Applies. The provisions of this article shall apply to all areas of special flood hazards within the jurisdiction of the City of Grants Pass, including any areas managed under Intergovernmental Agreement in accordance with the authority provided in Oregon Revised Statute Chapter 190.

13.232 Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard identified by the Flood Insurance Administration in a scientific and engineering

report entitled "Flood Insurance Study, Josephine County and Incorporated Areas," dated December 3, 2009, with accompanying Flood Insurance Maps, and any revision, are hereby adopted by reference and declared to be part of this Code. The best available information for flood hazard area identification as outlined in Section 13.245(2) shall be the basis for regulation until a new FIRM is issued which incorporates the data utilized under Section 13.245(2).

The areas of special flood hazard shall be depicted on the Special Purpose District overlay maps of this Code. The Flood Insurance Study and Flood Maps are on file at the Department of Community Development, and are available for public review.

13.233 Compliance. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this Article and other applicable regulations, including all applicable requirements of the State Building Code, and all FEMA requirements, including requirements of the FEMA/FIA Technical Bulletins.

Failure to comply with any of the requirements of this Article, including violations of conditions and safeguards established in connection with the conditions, shall constitute a violation. Penalties for violations and noncompliance, and remedies to correct violations and noncompliance, are governed by the provisions of Article 1 of this Code and any and all other provisions of this Code, the Municipal Code, and laws of the City of Grants Pass.

13.234 Abrogation and Greater Restrictions. This Article is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this Article and another ordinance, state building code, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

13.235 Interpretation. In the interpretation and application of this Article, all provisions shall be:

(1) Considered as minimum requirements;

(2) Liberally construed in favor of the governing body; and

(3) Deemed to neither limit nor repeal any other powers granted under state statutes and rules including the state building code.

13.236 Warning and Disclaimer of Liability. The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This article does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This article shall not create liability on the part of the City of Grants Pass, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

13.240 Administration.

13.241 Development Permit Required. A Development Permit shall be obtained before construction or development begins within any area of special flood hazard established in Section 13.232. The permit shall be for all structures including manufactured homes, as set forth in the Definitions section of this Article, and for all development including fill and other activities, also as set forth in the Definitions section of this Article.

13.242 Application and Submittal Requirements for Development Permit.

Application for a development permit shall be made on forms furnished by the Community Development Department and shall include the following. Actions which require a land use approval prior to a development permit shall include the required information as part of the land use application.

(1) Plan drawn to scale showing the nature, location, dimensions and elevations of the area in question;

(2) Existing and proposed structures, manufactured housing pads, fill, storage of materials, drainage facilities, and the location of the foregoing items;

(3) Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures;

(4) Elevation in relation to mean sea level of floodproofing in any structure;

(5) Certification by a registered professional engineer or architect that the floodproofing methods for any non-

residential structure meet the flood proofing criteria in Section 13.262;

(6) Description of the extent to which any watercourse will be altered or relocated as a result of the proposed development;

(7) Existing and proposed roadways;

(8) Area, location and finish elevations of all fill walls and rip-rap;

(9) Location and elevation of stored materials;

(10) Location and elevation of drainage facilities;

(11) Location and elevation of utilities; and

(12) Other plan requirements of this Code as applicable;

13.243 Elevation Certification. All required elevations shall be tied into known bench marks shown on the Flood Insurance Rate Map by a registered professional surveyor. Said surveyor shall attest to the procedure, bench marks used and accuracy of the required elevation over his signature and seal upon the required plan displaying the elevation information.

13.244 Designation of Local Administrator. The Community Development Director is hereby appointed to administer and implement this Article by granting or denying development permit applications in accordance with its provisions.

13.245 Duties and Responsibilities of Director. The duties of the Director shall include, but not be limited to, the following:

(1) Permit Review.

(a) Review all development permits to determine that the permit requirements and conditions of this article have been satisfied.

(b) Review all development permits to determine that all necessary permits have been obtained from those Federal, State or local governmental agencies from which prior approval is required.

(c) Review all development permits to determine if the proposed development is located in the floodway. If

located in the floodway, assure that the encroachment provisions of Section 13.270 are met.

(2) Use of Other Base Flood Data (in A and V Zones). When base flood elevation data has not been provided as required by this article, the applicant shall obtain and the Director shall review and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, in order to administer this article.

(3) Information to be Obtained and Maintained by the Director.

(a) Where base flood elevation data is provided through the Flood Insurance Study, Flood Insurance Rate Maps, or as required in Section (2) above: Obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basements and below-grade crawlspaces) of all new or substantially improved structures, and whether or not the structure contains a basement.

(b) For all new or substantially improved floodproofed structures where base flood elevation data is provided through the Flood Insurance Study, FIRM, or as required in Section (2) above:

(i) Verify and record the actual elevation (in relation to mean sea level); and

(ii) Maintain the floodproofing certifications required in Section 13.242(5).

(c) Maintain the records of all appeal actions and variances, and report any appeal actions or variances to the Federal Insurance Administration upon request.

(d) Maintain for public inspection all records pertaining to the provisions of this ordinance.

(4) Alteration of Watercourses.

(a) Notify adjacent communities, the Oregon Department of Land Conservation and Development (the State's NFIP Coordinating Agency), the Oregon Water Resources Department, and any other appropriate state and federal agencies, prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.

(b) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

(5) Interpretation of FIRM Boundaries. Make interpretations and determinations where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). If the location of a boundary is contested, the person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation or determination as provided in this article. Such appeals shall be reviewed consistent with the standards of this code and Section 60.6 of the Rules and Regulations of the National Flood Insurance Program (44 CFR 59-76).

(6) Location of FIRM Boundaries and Elevations.

(a) Make all information relating to the 100-year flood plain and floodway location and elevations available to the applicant, including the Flood Insurance Study with flood sections, the Flood Insurance Rate Maps showing flood elevations and elevation data reference points, and other floodplain development surveys in the immediate vicinity.

(b) Certify that the location of the floodway and 100-year flood plain, and existing and proposed elevations, have been made for the applicant by a professional land surveyor registered in Oregon, and that the signature and seal are affixed certifying the accuracy of such determination.

(c) Certify that the finished floor elevations, and other finished elevations of the proposal affecting the floodway or 100-year flood plain have been constructed or developed to the approved elevations, as certified by a registered professional surveyor over his signature and seal.

(d) Upon request, provide the information in this Section to the applicant, applicant's lender and/or insurance agent.

(e) Should an applicant pursue a change in floodplain or floodway designation from the Federal Emergency Management Agency, assist the applicant with information about the process.

13.246 Variances. Variances to the provisions of this Article shall be processed in accordance with the procedures of Article 2 and the provisions of Article 6 of this Code. Any variance to the Flood Hazard provisions of this Article shall include a recommendation of the City Engineer as specified in Section 6.060(B)(11) and shall address the additional provisions of this Section, except as provided in Subsection (3) of this Section.

(1) Factors to Consider. The review body shall consider all technical evaluations, all relevant factors, and standards specified in this Article, and the following:

(a) The danger that materials may be swept onto other lands to the injury of others;
(b) The danger to life and property due to flooding or erosion damage;
(c) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner and occupants;
(d) The importance of the services provided by the proposed facility to the community;
(e) The necessity to the facility of a waterfront location, where applicable;
(f) The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
(g) The compatibility of the proposed use with existing and anticipated development;
(h) The relationship of the proposed use to the comprehensive plan and floodplain management program;
(i) The safety of access to the property in times of flood for ordinary and emergency vehicles;
(j) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and
(k) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

(2) Additional Guidelines and Requirements for Variances to the Provisions of this Article. In addition to the variance criteria in Article 6, the review body shall address the provisions of this Section.

(a) Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be

erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing the items in Subsection (1) of this Section have been fully considered. As the lot size increases, the technical justification required for issuing the variance increases.

(b) Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.

(c) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(d) Variances to the provisions of this Article shall only be issued upon findings of:
(i) A showing of good and sufficient cause;
(ii) A determination that failure to grant the variance would result in exceptional hardship to the applicant;
(iii) A determination that the granting of the variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense; create nuisances; cause fraud on or victimization of the public in consideration of the factors of Subsection (1) of this Section; or conflict with existing local laws or ordinances.

(e) Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece of property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.

(f) Variances may be issued for non-residential buildings in very limited circumstances to allow a lesser degree of flood-proofing than watertight or dry-proofing, where it can be determined that such action will have low damage potential, comply with all other provisions of this Subsection other than (a), and otherwise comply with the provisions of Section 13.252 (Anchoring) and 13.253 (AH Zone Drainage).

(3) Exceptions for Historic Properties. Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the Statewide Inventory of Historic Properties in accordance with Article 6, without regard to the additional provisions of Subsections (1) and (2) of this Section. In such case, the variance shall be part of the review and approval by the Historic Buildings and Sites Commission required in Article 13.400 of this Code. In addition:

(a) Such variances shall be only the minimum deviation from NFIP criteria that is necessary to assure that the historic character and design is not destroyed; and

(b) The variance must not preclude the continued designation of the structure as an historic structure.

Any measures that can be taken to reduce future flood damage consistent with this Subsection shall be required, such as elevating an air conditioner or using flood-resistant materials.

(4) Conditions Attached to Variances. Upon consideration of the factors in Subsection (1) and the purposes of this Code and Article, if a variance is granted, the review body may attach conditions to the variance as it deems necessary to further the purposes of this Code.

(5) Notification of Effect on Flood Insurance Rates. Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation.

(6) Record-Keeping. The Director shall maintain the records of all variances and shall report any variances to the Federal Insurance Administration upon request.

13.247 Appeals. Appeals to interpretations of the provisions of this Article or determinations regarding the application of the provisions of this Article shall be undertaken in as provided in Article 10 of this Code. The Director shall maintain the records of all appeal actions and shall report any appeal actions to the Federal Insurance Administration upon request.

13.250 Provisions for Flood Hazard Reduction.

13.251 General Standards. In all areas of special flood hazards, the standards set forth in this Article are required.

13.252 Anchoring.

(1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.

(2) All manufactured homes shall likewise be anchored to prevent flotation, collapse or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques).

13.253 AH Zone Drainage. Adequate drainage paths are required on slopes to guide floodwaters around and away from proposed structures.

13.254 Construction Materials and Methods.

(1) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

(2) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

(3) Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

13.255 Utilities and Services.

(1) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system;

(2) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters;

(3) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding consistent with the requirements of the Oregon Department of Environmental Quality;

13.256 Subdivision and Development Proposals, Partitions, and Planned Unit Developments.

No proposed subdivision or partition of land or planned unit development plan, or other development located within an area of special flood hazard shall be approved without meeting the requirements of this article. All of the applicable mapping and certification requirements of this article shall be met at the Tentative Map, Plat or Plan stage of review for subdivisions, partitions, and planned unit developments (See also Article 17, Lots and Creation of Lots, and Article 18, Planned Unit Development.)

(1) All development proposals, including subdivision proposals, shall be consistent with the need to minimize flood damage;

(2) All development proposals, including subdivision proposals, shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage;

(3) All development proposals, including subdivision proposals, shall have adequate drainage provided to reduce exposure to flood damage; and

(4) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for development proposals, including subdivision proposals, which have the potential for 5 dwelling units or more or contain 1 acre or more, whichever is less.

13.257 Review Where Elevation Data Not Available. Where elevation data is not available through the Flood Insurance Study FIRM, or another authoritative source, applications for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate the lowest floor at least two feet above grade in these zones may result in higher insurance rates.

13.260 Specific Standards.

In all areas of special flood hazards where base flood elevation data has been provided (Zones A1-30, AH, and AE) as set forth in Section 13.232 (Basis for Establishing the Areas of Special Flood Hazard) or Section 13.245(2) (Use of Other Base Flood Data), the following provisions are required.

13.261 Residential Construction.

(1) New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to a minimum of one foot above the base flood elevation.

(2) Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

(a) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall provided.

(b) The bottom of all openings shall be no higher than one foot above grade.

(c) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

13.262 Non-Residential Construction.

(1) New construction and substantial improvement of any commercial, industrial or other non-residential structure shall either have the lowest floor, including basement, elevated to a minimum of one foot above the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

(a) Be floodproofed so that the structure is watertight with walls substantially impermeable to the passage of water to a level of one foot above the base flood elevation;

(b) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

(c) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this section based on their development and/or review of the structural design, specifications and plans. Such certifications shall also provide that the provisions of 13.254 are satisfied. Such certifications shall be provided to the Director as set forth in Section 13.245(3)(b).

The certification by a registered professional engineer or architect shall specify that the floodproofed methods for any commercial or industrial structure are adequate to withstand the flood depths, pressures, velocities, impacts and uplift forces and other factors associated with the base flood.

(2) Non-residential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in Section 13.261(2).

(3) Applicants floodproofing non-residential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building floodproofed to the base flood level will be rated as one foot below that level).

13.263 Manufactured Homes.

(1) All manufactured homes to be placed or substantially improved on sites listed below shall be elevated on a permanent foundation such that the finished floor of the manufactured home is elevated to a minimum of 18 inches (46 cm) above the base flood elevation and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement:

(*NOTE*: See 2002 Oregon Manufactured Dwelling and Parks Specialty Code, Chapter 3 *Manufactured Dwelling Installations* and Chapter 10 *Manufactured Dwelling Park Construction*. That code also includes the following provisions: 3-2.4.1.(b)1 requires that the top of the dwelling stand be at least one foot above base flood elevation unless openings are provided per FEMA Technical Bulletin 1-93. 10-2.2(d) specifies that manufactured dwelling parks or park expansions shall not be permitted

in a flood hazard area unless the stands are elevated above the base flood elevation).

(a) Outside of a manufactured home park or manufactured home subdivision;

(b) In a new manufactured home park or manufactured home subdivision;

(c) In an expansion to an existing manufactured home park or manufactured home subdivision;

(d) In an existing manufactured home park or manufactured home subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood.

(2) Manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or manufactured home subdivision within Zones A1-30, AH, and AE on the community's FIRM that are not subject to the above manufactured home provisions shall be elevated so that either:

(a) The finished floor of the manufactured home is elevated to a minimum of 18 inches (46 cm) above the base flood elevation; or

(b) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement.

13.264 Recreational Vehicles. Any recreational vehicle placed on a site within Zones A1-30, AH, AE shall either:

(1) be on the site for fewer than 180 consecutive days;

(2) be fully licensed and ready for highway use, on its wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, with no permanently attached additions;

(3) meet the requirements of 12.263 above and the elevation and anchoring requirements for manufactured homes; or

(4) be stored within a fully enclosed building that is floodproofed or elevated in accordance with the requirements of Section 13.262.

Nothing in the Section is intended to authorize the use of a recreational vehicle in a manner otherwise prohibited by this Code or other laws.

13.265 Crawlspaces and Below-Grade Crawlspaces. At-grade crawlspaces are the preferred method of crawlspace construction within flood hazard areas. However, below-grade crawlspaces are permitted, and are not considered basements, if all of the following are satisfied. *See Figures 13-1, 13-2 and 13-3.*

Otherwise, below-grade crawlspaces are considered basements and subject to applicable requirements for basements. A basement floor is considered the lowest floor (see definition) and must meet requirements for the lowest floor.

(1) Except as provided in this paragraph, because of hydrodynamic loads, the velocity of floodwaters at the site shall not exceed 5 feet per second where a below-grade crawlspace is used. For velocities in excess of 5 feet per second, other foundation types shall be used, or the design shall be approved and stamped by a qualified registered architect or professional engineer. Other types of foundations are recommended for these areas.

The determination of velocity shall be based on the mean floodway velocity in Table 6 of the Flood Insurance Study for Josephine County and Incorporated Areas with a December 3, 2009 effective date where that information is available.

In areas where the mean floodway velocity may exceed 5 feet per second and flood velocity information is not available, such as for the floodway fringe, flood velocity at the building site shall be determined by an engineer knowledgeable in hydraulics and hydrology who is qualified to determine flood velocities at the building site, unless the Building Official determines flood velocities at the building site do not exceed 5 feet per second based on accepted practices or presumptive determinations in accordance with NFIP standards.

(2) The building must be designed and adequately anchored to resist or eliminate flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Hydrostatic loads and the effects of buoyancy can usually be addressed through the required openings described in Subsection (3) of this Section.

(3) Below-grade crawlspaces (and other crawlspaces designs) are enclosed areas below the base flood elevation (BFE) and, as such, must have openings that equalize hydrostatic pressures by allowing the automatic entry and exit of floodwaters. The bottom of each flood vent opening shall be no more than 1 foot above the lowest adjacent exterior grade.

(4) For all crawlspaces, portions of the building below base flood elevation shall be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawlspace used to elevate the building, but also any joists, insulation, or other materials that are below the base flood elevation. If flood-resistant materials are not used for building elements, those elements shall be elevated above base flood elevation. The recommended construction practice is to elevate the bottom of joists and all insulation at least one foot above base flood elevation. Most types of insulation are not flood-resistant materials.

Flood-resistant materials shall be determined and where used, shall be in accordance with *FEMA Technical Bulletin 2, Flood Damage-Resistant Materials Requirements, August 2008*, or as revised.

(5) Any building utility systems within a crawlspace shall be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions. Ductwork, in particular, must either be placed above the base flood elevation or sealed from floodwaters.

FEMA Bulletin 348, *Protecting Building Utilities from Flood Damage*, provides detailed guidance on designing and constructing flood-resistant utility systems.

(*NOTE*: Section R324.1.5 of the residential Building Code also addresses mechanical and electrical systems. Section 7 and Table 7-1 of ASCE Standard 24-05, *Flood Resistant Design and Construction*, also address utility requirements and may include requirement for elevation higher than base flood elevation for certain situations).

(6) The interior grade of a below-grade crawlspace below the base flood elevation shall not be more than 2 feet below the lowest adjacent exterior grade as shown in Figure 13-3.

(7) The height of a below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall shall not exceed 4 feet at any

point as shown in Figure 13-3. The height limitation is the maximum allowable unsupported wall height according to the engineering analyses and building code requirements for flood hazard areas.

(8) The drainage system shall be designed to remove floodwaters from the interior area of the crawlspace in a maximum time of 72 hours. The type of drainage system will vary because of the site gradient and other drainage characteristics, such as soil types. Options include, but are not limited to, natural drainage through porous, well-drained soils, drainage systems such as perforated pipes, drainage tiles, or gravel or crushed stone drainage by gravity or mechanical means. The drainage system shall be a system approved by the Building Official or shall be designed and stamped by the applicant's engineer.

(NOTE: Buildings that have below-grade crawlspaces will have higher flood insurance premiums than buildings that have the preferred crawlspace construction with the interior elevation at or above the lowest adjacent grade, even when the crawlspace meets the requirements of this section and FEMA Technical Bulletin 11-01. Buildings with below-grade crawlspaces currently cannot be rated by an insurance agent using the NFIP Flood Insurance Manual. They must be submitted for a special rating under the "Submit-to-Rate" process by underwriters knowledgeable in this type of construction).

Figure 13-1. Preferred Crawlspace Construction

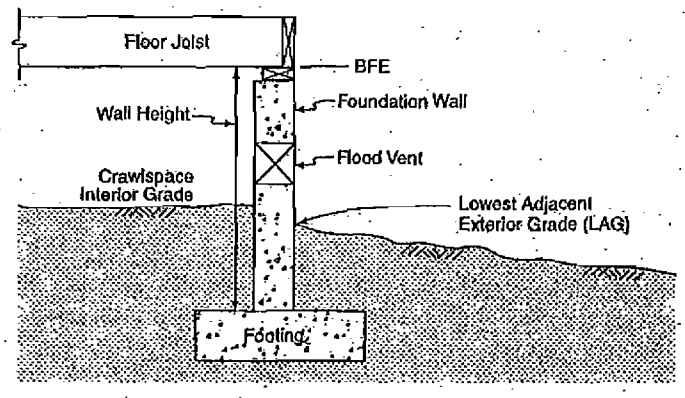


Figure 13-2. Below-Grade Crawlspace Construction

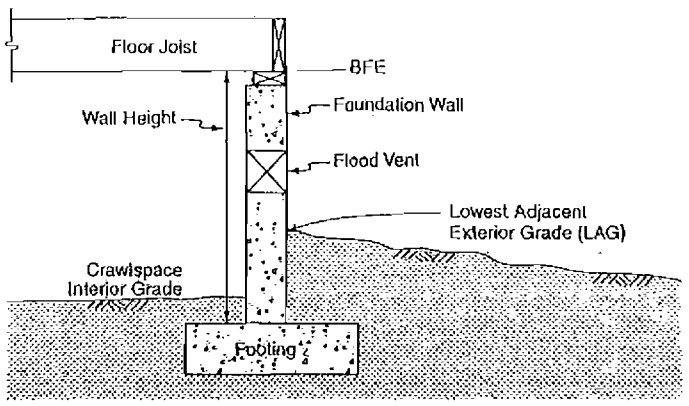
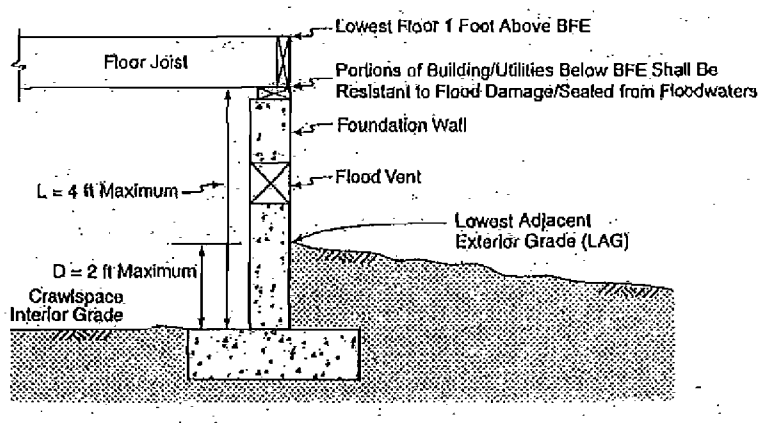


Figure 13-3. Requirements for Below-Grade Crawlspace Construction



13.270 Floodways.

Located within areas of special flood hazard are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the provisions of this Section apply.

13.271 Designated Floodways.

(1) Except as provided in Section (3) below, encroachment, fill, new construction, substantial improvements or other development shall not occur within a floodway designated by Flood Insurance Study or Flood Insurance Rate Maps

unless a tecnnical evaluation is performed and certified by a registered professional civil engineer, and demonstrates through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that encroachments, including any surrounding property modifications or improvements, shall not result in any increase in flood levels during the occurrence of the base flood discharge.

(2) If subsection (1) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of this code.

(3) Projects for stream habitat restoration may be permitted in the floodway provided:

(a) The project qualifies for a Department of the Army, Portland District *Regional General Permit for Stream Habitat Restoration* (NWP-2007-1023); and

(b) A qualified professional (a Registered Professional Engineer; or staff of NRCS; the county, or fisheries, natural resources, or water resources agencies) has provided a feasibility analysis and certification that the project was designed to keep any rise in 100-year flood level as close to zero as practically possible given the goals of the project; and

(c) No structures would be impacted by a potential rise in flood elevation; and

(d) An agreement to monitor the project, correct problems, and ensure that flood carrying capacity remains unchanged is included as part of the local approval.

(4) New installation of manufactured dwellings is prohibited, except as provided in this Section (as regulated by the 2002 Oregon Manufactured Dwelling and Park Specialty Code). Manufactured dwellings may only be located in floodways according to one of the following conditions:

(a) If the manufactured dwelling already exists in the floodway, the placement was permitted at the time of the original installation, and the continued use is not a threat to life, health, property, or the general welfare of the public; or

(b) A new manufactured dwelling is replacing an existing manufactured dwelling whose original placement was permitted at the time of installation and the

replacement home will not be a threat to life, health, property, or the general welfare of the public, and it meets the following criteria:

(i) As required by 44 CFR Chapter 1, Subpart 60.3(d)(3), it must be demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that the manufactured dwelling and any accessory buildings, accessory structures, or any property improvements (encroachments) will not result in any increase in flood levels during the occurrence of the base flood elevation;

(ii) The replacement manufactured dwelling and any accessory buildings or accessory structures (encroachments) shall have the finished floor elevated a minimum of 18 inches (46 cm) above the base flood elevation as identified on the Flood Insurance Rate Map;

(iii) The replacement manufactured dwelling is placed and secured to a foundation support system designed by an Oregon professional engineer or architect and approved by the Community Development Department;

(iv) The replacement manufactured dwelling, its foundation supports, and any accessory buildings, accessory structures, or property improvements (encroachments) do not displace water to the degree that it causes a rise in the water level or diverts water in a manner that causes erosion or damage to other properties;

(v) The location, use, and improvements of a replacement manufactured dwelling complies with all provisions of this Code, other applicable Codes, and any conditions of approval; and

13.272 Floodways Not Designated.

(1) In areas where a regulatory floodway has not been designated in the Flood Insurance Study or on the Flood Insurance Rate Maps, no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the Flood Insurance Rate Map, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated

development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

(2) Development shall not occur on any floodplain lands, where a floodway has not been designated for that reach of a stream or river in the Flood Insurance Study referenced in Section 13.232 of this Code unless:

(a) The Director has evidence which in his judgment would indicate the proposed development site is located in an area of shallow flooding, and the proposed development complies with the provisions of Section 13.280 and will not divert the flood or cause a rise in the level of the discharge above the base flood elevation; or

(b) A technical study is completed which establishes the probable location of the floodway as defined in this Code, and the proposed development complies with the applicable provisions of this Code, whether it is within the floodway or the floodway fringe.

(3) If a technical study is completed under the requirements of this section, demonstrating that the encroachment will not increase the flood levels, any permitted construction or substantial improvements shall comply with all other applicable standards of this Code.

13.280 Standards for Shallow Flooding Areas (AO Zones).

Shallow flooding areas appear on Flood Insurance Rate Maps as AO zones with depth designations. The base flood depths in these ones range from 1 to 3 feet above ground where a clearly defined channel does not exist, or where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is usually characterized as sheet flow. In these areas, the following provisions apply:

(1) Residential Structures. New construction and substantial improvements of residential structures and manufactured homes within AO zones shall have the lowest floor (including basement) elevated above the highest grade adjacent to the building, a minimum of one foot above the depth number specified on the Flood Insurance Rate Map, or at least two feet above the highest grade adjacent to the building if no depth number is specified.

(2) Nonresidential Structures. New construction and substantial improvements of nonresidential structures within AO zones shall either:

(a) Have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, a minimum of one foot above the depth number specified on the Flood Insurance Rate Map, or at least two feet above the highest grade adjacent to the building if no depth number is specified; or

(b) Together with attendant utility and sanitary facilities, be completely floodproofed to a minimum of one foot above the depth number specified on the Flood Insurance Rate Map, or at least two feet above the highest grade adjacent to the building if no depth number is specified, so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect as in Section 13.262.

13.290 Critical Facilities and Essential Facilities

13.291 Critical Facilities.

(1) It is recommended that construction of new critical facilities is, to the extent possible, located outside the limits of the Special Flood Hazard Area (SFHA) also known as the 100-year floodplain.

(2) It is recommended that construction of new critical facilities occur within the SFHA only if no feasible alternative site is available.

(3) The following are recommended when Critical Facilities are constructed within the SFHA. Recommendations in this Section do not affect other mandatory provisions of this Code or other applicable codes.

(a) It is recommended that Critical Facilities constructed within the SFHA have the lowest floor elevated a minimum of three feet or to the height of the of the 500-year flood, whichever is higher.

(b) It is recommended that access to and from the critical facility should also be protected to the height utilized above. When those heights are not feasible, it is at least recommended that access routes be elevated to or above the level of the base

flood elevation to all critical facilities to the extent possible.

(4) Floodproofing and sealing measures should be taken to ensure that toxic substances will not be displaced by or released into floodwaters.

13.292 Essential Facilities.

(1) Siting and construction of Essential Facilities, as defined in the State Building Code, shall comply with the applicable provisions of the State Building Code, and other documents adopted by reference in the State Building Code, such as the ASCE Standards.

SAFEGUARDS FROM HAZARD AREAS

Geologic Hazard Areas

Since there is no recent record of any geologic activity in the region, it is reasonable to assume that development may proceed without implementing safeguards such as earthquake design or avoidance of location on fault lines.

Slope Hazard Areas

The most effective method for the city and county to minimize the hazards of development on steep slopes is to review the development process. Slopes in the excess of 35% should be considered hazardous areas. Development that is proposed on slopes greater than 35% should be required to have development plans approved by a licensed engineering geologist in order to ensure that soil erosion and earth movement hazards will be minimized. A review of hillside developments on slopes 15% to 35% should be made by an engineer and a soil scientist in order to minimize the hazards to the structure and to reduce the potential for erosion. Supplemental engineering and site design may be required to lessen the degree of risk.

Soil Hazard Areas

In the preceding subsection, the various soils within the UGB area are inventoried according to a set to characteristics that relate the properties of each soil to specific hazards.

Safeguards for each hazard are primarily related to regulations that protect the stability of the soil and the major hazard for most soils. Once significant soil erosion begins in an area, drastic and costly "stop-gap" measures must be implemented to arrest the rate of erosion. Preventive measures for soil stability on erodible soils is often the best approach. Such preventive measures are:

- traps to keep top soil on the site
- leaving natural vegetation in place
- reducing surface water run-off with vegetative planting and keeping natural water retention areas.

Shrink-swell and road building hazards can be safe-guarded with adequate design and site preparation. An important task is to ensure that builders and developers are made aware of the soil properties of the site or area before planning and construction begin. The soil mapping and inventory of this section should serve as adequate generalized information regarding the hazards of soils within the UGB area. Site specific analysis of the soils should be encouraged in sensitive areas where soils are exposed to weathering and/or where slopes are steeper than 35% percent.

The relationship between steep topography, soils and natural vegetation becomes increasingly delicate as the percentage of slope increases. This delicate balance is strongly affected by human actions in developing or preparing sites for development. Extensive excavations for cut and fills, premature removal of natural vegetation and the additional load placed on a hillside by development can lead to earth movement in the form of slope erosion or mass movement.

ATTACHMENT 4

5.30 FLOOD HAZARD

PURPOSE

The purpose of this section is to describe the history of flooding in the urban growth boundary area, identify the flood-prone areas, evaluate the degree of hazard, and describe the appropriate safeguards from flooding.

HISTORY OF FLOODING

The earliest recorded flood in Josephine County occurred in 1861. Since no subsequent flood has surpassed the magnitude of that flood, it has been chosen to represent the "100 year flood." (Army Corps of Engineers) Flood magnitudes are rated by their chance of annual occurrence. A "100 year flood" is assumed to have a 1% chance of occurring each year. A "1 year flood" is assumed to have a 100% chance of occurring each year. These are mathematical relationships that ignore the natural variables which affect the weather. Table 5.30.1 depicts the major floods of the Rogue River at Grants Pass during the last 120 years.

TABLE 5.3.1
Major Floods of the Rogue River at Grants Pass

Flood Year	Water Discharge in Cubic Feet Per Second (cfs)
Nov. - Dec., 1861	175,000 cfs ("100 year")
Feb., 1890	160,000 cfs
Feb., 1907	60,500 cfs
Nov., 1909	70,000 cfs
Feb., 1927	138,000 cfs
Dec., 1942	54,400 cfs
Dec., 1945	70,000 cfs
Jan., 1948	59,900 cfs
Oct., 1950	65,400 cfs
Jan., 1953	77,000 cfs
Dec., 1955	135,000 cfs
Dec., 1964	152,000 cfs ("50 year")
Dec., 1972	82,500 cfs
Dec., 1974	96,400 cfs

The table reveals that there is little mathematical order to the occurrence of floods. Floods of similar magnitude can occur within a few years of each other, such as the February 1907 and November 1909 floods and the October 1950 and January 1953 floods. Floods of relatively great magnitude can occur within a decade of each other, such as the December 1955 and December 1964 floods. The long range forecasting of flood occurrences would seem able to predict only that floods will occur at random intervals and at varying magnitudes.

FLOODPRONE AREAS

The Rogue River flows through the approximate center of the Urban Growth Boundary area. There are five confluent creeks that discharge into the Rogue River within the UGB. Map 5.30.3 shows the UGB and the floodprone areas (shaded). **The actual areas of special flood hazard are identified by the Federal Emergency Management Agency in a scientific and engineering report titled "Flood Insurance Study" with the accompanying Flood Insurance Rate Maps for Josephine County and Incorporated areas effective date December 3, 2009, and any revision**. These areas were subject to flooding during the 1964 flood. Note that flood levels protruded into the channels of Gilbert and Allen Creeks. This phenomenon occurs because the flood level of the river is at a high elevation and the flood waters of the creeks are effectively "dammed" by river water. Water always seeks mean sea level and, therefore, is always flowing to the ocean. When the creeks are dammed by the river, then they overflow their banks upstream and water flows in sheets over the surface of the land in its relentless search for sea level. Therefore, the confluent creeks of the UGB area are also prone to a flood hazard relative to the magnitude of the river flooding.

DEGREE OF FLOOD HAZARD

The degree of flood hazard is measured in terms of loss of life and property. No deaths from flooding in the Grants Pass area are noted in the literature. Flood warnings usually occur in time to prevent loss of life, as people are able to move out of the floodprone areas. However, real property and improvements such as buildings are subject to the forces of flooding water. A quote from the Postflood Report, December 1964 Flood (Army Corps of Engineers) can dramatically relate the damages to property by flooding.

"One of the major factors causing excessive damages during this flood was the enormous quantity of debris brought into the channel from every source. This debris collected behind bridges resulting in the complete destruction of several, and major damage to nearly ever other bridge across the main stream. It also contributed to residential damage all along the river, knocking buildings from their foundations or smashing into walls."

Within the UGB area, residential areas on both sides of the river were flooded up to 8 feet. (Postflood Report, 1964. Army Corps of Engineers). The city sewage treatment plant sustained damages estimated at about $65,000. The Postflood Report did not summarize the value of residential damage but did state the values of the home flooded to be between $30,000 and $50,000 per home and estimated the average residential damage to be $900 per residence. Exhibit 5.30.2 shows an aerial view of the flooding of 1964.

EXHIBIT 5.30.2
Aerial View of 1964 Flood

SAFEGUARDS FROM FLOODING

Safeguards from flooding that can be implemented at the local level are warning systems, land use regulations and the Federal Flood Insurance Program.

Warning Systems

The Army Corps of Engineers operates a computer simulation model for the hydrological characteristics of all the significant water drainage basins in Oregon. That simulation model can predict fairly accurately when a flooding river system will "crest", or reach its highest flooding elevation, and what the elevation will be at the "crest." That information is provided to all radio stations and local emergency units like the police and national guard. If elevations of floodprone areas are known by recognized landmarks, then people and mobile property can be removed from the anticipated flooding area. An emergency evacuation program that employs local police, fire department and other civic groups can help facilitate the relocation of persons and property from a floodprone area.

Land Use Regulations

The City and/or County can regulate the use of land within known floodprone areas. The regulations can range from allowing no development in floodprone areas to allowing any type of development in conjunction with federal floodplain laws. The regulations can also selectively designate floodprone areas as public open space for parks, wildlife areas and floodways. Public open spaces would allow active public use of the land and enhance the attractiveness and livability of the Urban Growth Boundary Area, while reducing future potential losses of life and property from flooding.

Land use regulations can also be used to set aside land areas for the detention of storm water. Those lands, such as wetlands, grassed waterways, and woodlands, may reduce flood elevations of the frequent small floods, and prevent future increases in flood heights of these frequent floods.

Flood heights have the potential for increase in proportion to the increases in urban level development in the Boundary area. Urban development increases the amount of storm water runoff by increasing the area of impervious surfaces such as streets, driveways, parking lots, and rooftops. If the natural storm water detention areas of the UGB area are converted to impervious surfaces by urban development, then the storm water runoff will flow more rapidly over the surface, into stormdrains and on to the creeks and the river, thereby increasing the elevation of the flood and/or decreasing the elapsed time between the beginning of the flood and the flood "crest".

Land use regulations can provide equitable transfers of land use intensities for each land use type from the floodprone areas and storm water detention areas to other less sensitive areas.

For example, a proposed residential development in an area with potential for storm water detention may be encouraged to preserve the detention area through incentives encouraging the transfer of density. The potential number of dwelling units that can be built on the detention area may be transferred to the remaining buildable area of the land that has less potential for detention. In this way, the developer retains the revenue potential of the development, and may even reduce the costs

of development by clustering. The community retains an open space and a storm water detention area, reducing the hazard of flood, and reducing the size and cost of storm drain lines.

Federal Flood Insurance Program

The catastrophic nature of flooding and the relatively localized effect of intermittent floods caused the insurance industry to find it financially unfeasible to provide flood insurance at reasonable rates. Increasingly, the federal government was requested to act to protect and safeguard private property. Legislation was passed in 1956, but money was never appropriated to implement the program. Further studies resulted in Title XIII, National Flood Insurance, part of the Housing and Urban Development Act of 1968 (Public Law 90-448) and the Flood Disaster Protection Act of 1973. Together these acts created an enormous federal subsidy in an effort to provide reasonable flood insurance at affordable rates. In effect, the federal government underwrites private insurance companies and subsidizes insurance premiums by paying the difference between the "affordable" premium which is charged to the policyholder, and the actuarial or "true cost" premium. The actuarial premium would be the rate charged to the policy holder if the insurance policy were written based on the statistical likelihood of flooding combined with the potential losses resulting from flood damage. In exchange for the reduced rate, property owners, through state and local governments, agree to adopt appropriate land use control measures to bring the risk of public and private losses to acceptable levels.

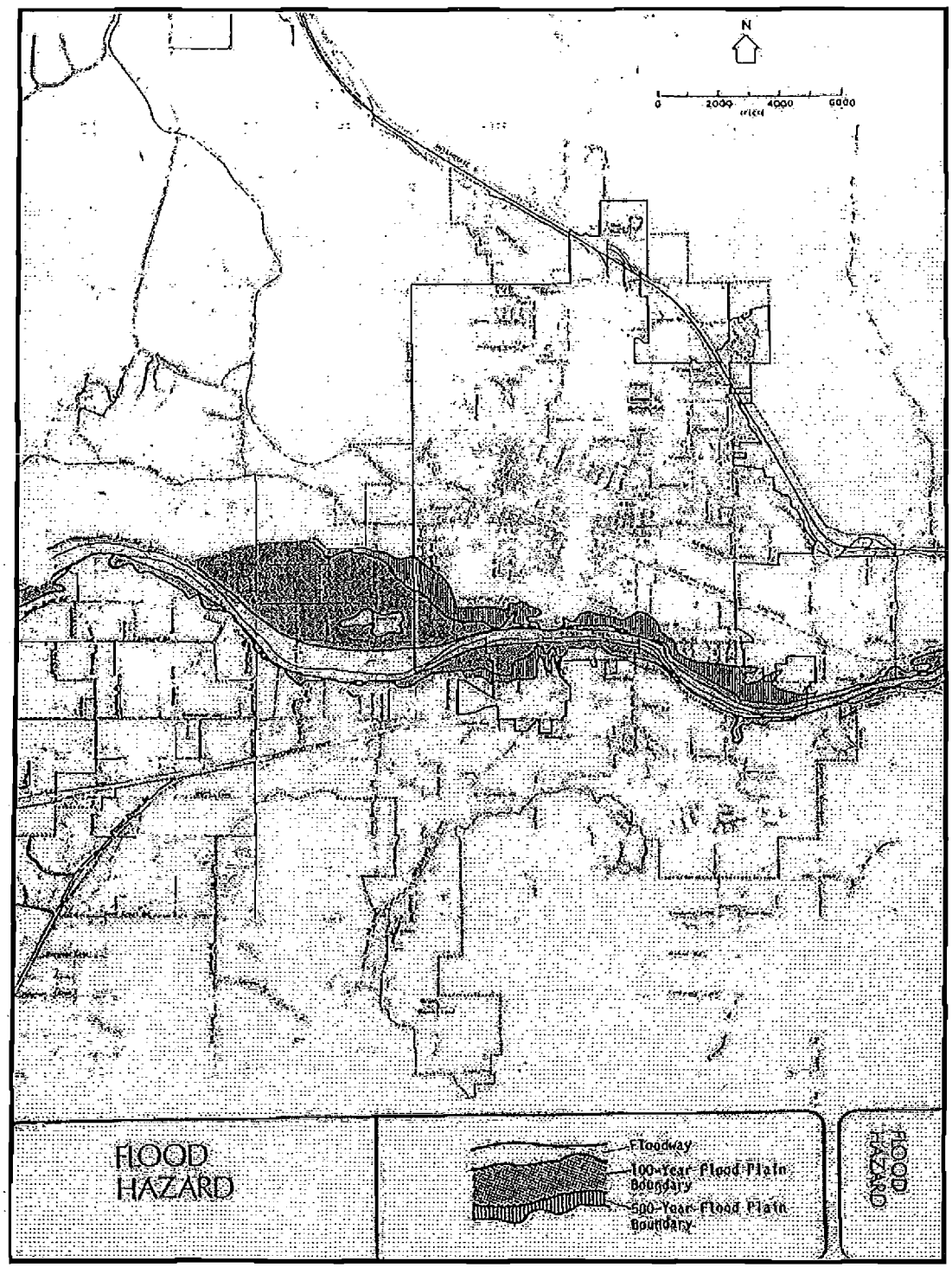
In 1979, work was completed on the Flood Insurance Study for the City of Grants Pass. A similar study was completed for Josephine County in 1980. Initial use of this information will be to convert Grants Pass and Josephine County to the regular flood insurance program of the Federal Insurance Administration. Streams in the area requiring detailed study were identified at informal meetings held in January 1978, between the U.S. Geological survey, the Federal Insurance Administration and the City of Grants Pass. The Rogue River and Gilbert Creek were studied by detailed methods. Although the Gilbert Creek flood plain is quite small, the density and intensity of streamside development justified establishing the flood zones by detailed methods. **Most recently, the Federal Emergency Management Agency completed a new Flood Insurance Study for Josephine County and Incorporated Areas dated December 3, 2009.**

A primary purpose of the National Flood Insurance Program is to encourage state and local governments to adopt and enforce land use practices within flood prone areas to the degree necessary to reduce the risk to acceptable levels as set forth in the program. Each Flood Insurance Study therefore includes a map which delineates the extent and location of areas subject to periodic inundation and differentiates between the floodway and 100-year and the 500-year flood boundaries. In order to provide a national standard without regional discrepancies, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for flood management and insurance purposes. The 500-year flood is indicated simply to make communities aware of additional areas in the community with perceivable levels of flood risk. Map 5.30.3 illustrates the approximate location of the floodway, the 100-year and 500-year flood boundaries. **The actual areas of special flood hazard are identified by the Federal Emergency Management Agency in a scientific and engineering report titled "Flood Insurance Study" with the accompanying Flood Insurance Rate Maps for Josephine County and Incorporated areas effective date**

December 3, 2009, and any revision.

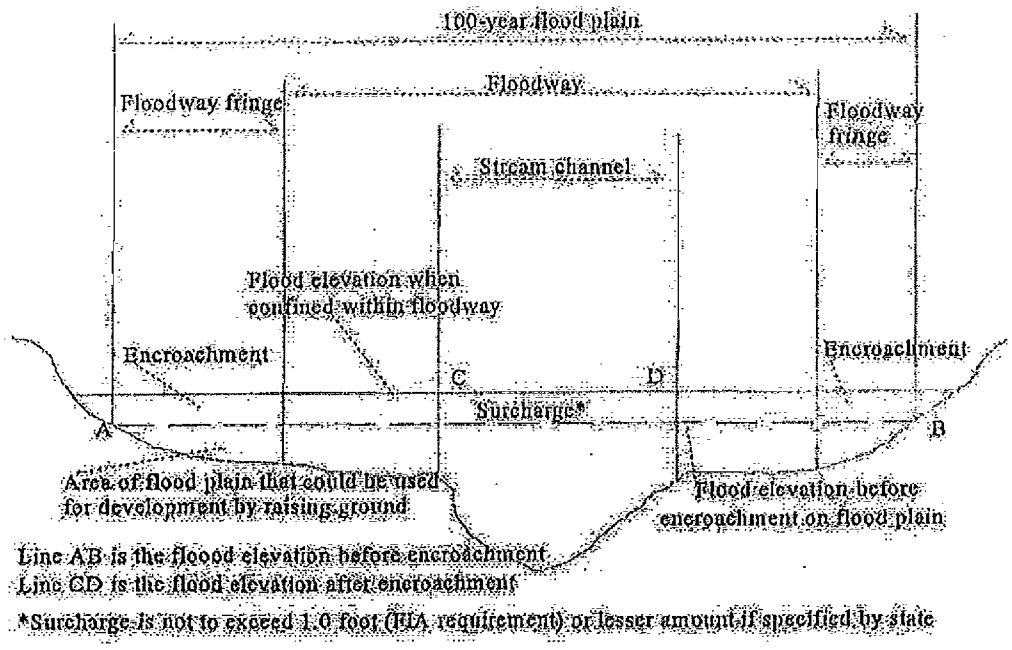
The principal result of the Flood Insurance Study is the Flood Insurance Rate Map. This map contains the official delineation of flood elevation lines. The level of flood risk and therefore insurance premiums are determined from this map.

MAP 5.30.3
Floodway and 100-Year Flood Plain for
Grants Pass Urban Growth Boundary



The National Flood Insurance Program divides the area of the 100-year flood into a floodway and floodway fringe. The floodway is the actual channel of a stream or river plus any adjacent flood plain areas that must be free of encroachment to allow the 100-year flood to flow freely without substantial increases in flood heights. Maximum federal standards establish a limit for flood height increases of one foot, provided that hazardous velocities are not produced. The area between the floodway and the boundary of the 100-year flood are termed the floodway fringe. Exhibit 5.30.4 depicts the relationship among the stream channel, floodway, floodway fringe and 100-year floodplain.

EXHIBIT 5.30.4
Floodway-Flood Plain Schematic



Insurance rates are based on the degree of flood risk. In order to establish actuarial insurance rates, the Federal Insurance Administration has developed a process to transform the data depicted in the floodway schematic drawing, into flood insurance criteria. That process includes the determination of flood hazard factors and flood insurance zone designations for each flooding river or creek.

The city has adopted a floodplain development ordinance that is in compliance with the National Flood Insurance Program. The city ordinance identifies buildable land within the 100-year floodplain as the floodway fringe. The floodway is not considered buildable. Development on the buildable land (floodway fringe) must be constructed so that the first floor level of the building is a minimum of one foot above the 100-year flood elevation. This regulation anticipates that once the floodway fringe is fully encroached upon by development, the actual flood elevation will be raised one foot above the 100-year flood level. Development in the floodway must demonstrate that encroachment will not raise the flood elevation beyond the one foot maximum above the 100-year

flood elevation. The federal regulations require that a qualified surveyor determine the degree of displacement. The displacement of floodway water by the proposed floodway development may adversely affect other development on the adjacent floodway fringe, which usually precludes floodway development in an urban area.

City of Grants Pass Municipal Code

EXHIBIT B

PROPOSED REVISED VERSION

Title 9

LAND DEVELOPMENT AND PUBLIC IMPROVEMENTS

Chapters:

City of Grants Pass Municipal Code

Chapter 9.99

CLAIMS FILED UNDER BALLOT MEASURE 7

(Ord. #5037 §1, 2000)

Sections:

9.99.010 Purpose. The purpose of this chapter is:

A. To create a process for the evaluation of claims filed under the Ballot Measure 7, adopted by the voters in November 2000, as an Amendment to Article I, Section 18, of the Oregon Constitution, and

B. To enable persons with valid claims an adequate and fair opportunity to present and resolve them in a timely, efficient, thorough, and consistent manner.

9.99.020 Definitions.

For the purpose of this Chapter 9.99, the following terms, phrases, words and their derivations shall have the meaning given in this section. When not inconsistent with the context, words used in the present tense include the future, words in the plural number include the singular number and words in the singular number include the plural number. Words not defined in Chapter 9.99 shall be given the meaning intended in Article 18, Section 1 of the Oregon Constitution, or as those words may be subsequently defined by Oregon Revised Statute. If not defined there, the words shall be given their common and ordinary meaning.

A. "Regulation" means a duly adopted City ordinance as codified in the Municipal Code, or any law, rule, ordinance, resolution, goal, or other enforceable enactment of the City of Grants Pass.

B. "Property Owner" means the owner of title to affected property or the contract purchaser of such property, where the contract is of record.

C. "Reduction in the Fair Market Value" means the difference in the fair market value of the property before and after application of the regulation including the net cost to the landowner of an affirmative obligation to protect, provide, or preserve wildlife habitat, natural areas, wetlands, ecosystems, scenery, open space, historical, archaeological or cultural resources, or low income housing.

D. "Affected Property" means the private real property claimed to have a reduction in the fair market value because of a regulation which was adopted, first enforced or applied after the property owner became owner and includes contiguous units of property under the same ownership and any structure built or sited on the property, aggregate and other removable minerals, and any forest product or other crop grown on the property.

E. "Exempt Regulation" means;

5 A regulation which imposes a restriction required under federal law, to the minimum extent required by federal law; or

5 A regulation prohibiting the use of a property for the purpose of selling pornography, performing nude dancing, selling alcoholic beverages or other controlled substances, or operating a casino or gaming parlor; or

5 A regulation governing historically and commonly recognized nuisance laws, including those nuisances described in Title 5 of the Grants Pass Municipal Code, as amended from time to time, and the criminal laws of the State of Oregon and the City of Grants Pass.

9.99.030 Notice of Claim.

A. A claim arising from the Ballot Measure 7 shall not be considered a claim unless notice of claim is filed as required by this Section and is signed by all owners of fee title (or portions thereof) to the property.

B. A notice of claim shall be in writing, filed with the City Manager (with a copy to the City Attorney) and shall contain not less than all of the following:

1. The name, address and telephone number of the person filing the claim.

2. The names and addresses of all property owners and all persons who hold a security interest in the affected property.

3. A legal description and street address of affected property including contiguous units of property under the same ownership.

4. Preliminary title report, dated not more than 30 days from the date the claim is filed, from a title insurance company licensed in Oregon.

5. A description of, and citation to, the regulation adopted, first applied or enforced on the affected property causing a reduction in the fair market value.

6. The date regulation was adopted, applied or enforced on the affected property.

7. The date property owner or owners obtained title to property or became contract purchasers of record.

8. A description of the use that has been restricted by the regulation.

9. The amount the affected property has suffered a reduction in the fair market value because of the regulation.

10. Statements explaining why the regulation is not an exempt regulation.

11. A written appraisal as set forth in section 9.99.040.

12. Any exempt regulations, known to the claimant that may apply to the affected property, whether or not those exempt regulations affect the fair market value.

13. A statement explaining how the regulation restricts the use of the affected property and why the regulation has the effect of reducing the fair market value of the property upon which the regulation is imposed.

14. A statement of the effect a release of the regulation on the property would have on the potential development of the property, stating the greatest degree of development that would be permitted if the identified regulation were released from the property.

15. If the regulation is a land use regulation, written demonstration that the claimant has previously sought an amendment, repeal, or a variance to the regulation.

16. A statement of the relief sought by the claimant.

C. A notice of claim must be accompanied by an application fee of $3,000 to be paid in advance of acceptance for filing to cover the costs of a complete review of the regulation, an independent appraisal of the property by the City, notices to properties which could be affected by a release of the regulation, hearings to determine the validity of the claim and routine processing of the claim.

D. The application fee shall be refunded if the City or an appellate body determines that just compensation should be paid based on Ballot Measure 7 or that based on discretion the regulation should not be currently enforced or applied.

9.99.040 Appraisal.

A written appraisal shall comply with the following specific requirements:

A. The appraisal shall be performed by an appraiser certified or licensed under ORS Chapter 674 that provides an opinion of the difference in the fair market value of the affected property before and after application of the regulation.

B. The appraisal shall specifically include and address consideration of the value of the property if all other properties throughout the community are permitted to develop without regulation.

C. The appraisal shall include a statement that the before value of the property was not reduced by any regulations which were passed, adopted, first enforced or applied to the property on or before December 6, 2000.

D. The appraisal must expressly note all existing infrastructure limitations and value the property without an assumption that the infrastructure will be improved at governmental expense or through discretionary governmental action.

E. The appraisal's consideration of the reduction in fair market value shall be limited to the difference in the fair market value of the property before and after the application of the regulation.

F. The analysis must include the net cost to the landowner of an affirmative obligation to protect, provide, or preserve wildlife habitat; natural areas; wetlands; ecosystems; scenery; open space; historical, archeological, or cultural resources; or low-income housing, except to the minimum extent that a regulation or restriction is necessary to comply with federal law.

G. The analysis shall not include consideration of any other damage that the regulation may have upon the property in question or any other property owned by the applicant.

H. The appraisal must expressly consider the effect of the aforesaid Ballot Measure 7 on the availability of other real property including the extent to which the supply of such other real property is or will be increased due to the repeal or waiver of restrictions following the passage of Measure 7.

I. The appraisal report must clearly state: (1) the assumptions related to the regulation(s) restricting the use(s) of the property; (2) the dates of valuation; (3) the assumptions related to uses allowed on the property if the regulation had not been enacted, enforced, or applied; (4) any statistical, economic, econometric, or other calculations, models, or methods used to determine reduction in value; (5) the comparable properties evaluated; and (6) the methodology used by the appraiser to determine the reduction in fair market value.

9.99.050 Completeness Review of Notice of Claim.

A notice of claim shall not be considered a claim until determined to be complete by the City Manager. If the notice of claim is not complete, the City Manager shall inform the claimant in writing of the additional information necessary to make the notice of claim complete. The notice of claim shall be deemed complete at such time as the additional information is submitted and determined complete.

9.99.060 Evaluation of the Claim.

Claims shall be processed as follows:

A. Upon the filing of a complete notice of claim, the City Manager shall make a recommendation to the City Council as to disposition of the claim and schedule the matter for consideration by the Council.

B. Notice of the time and date of a hearing at which the Council will consider the claim shall be mailed to the claimant (and all owners of record of property on the most recent property tax assessment roll where such property is located within 500 feet of the affected property) not less than 10 days prior to the date of consideration. Personal notice to the claimant prior to the 10 days or physical presence of the claimant at the hearing shall be equivalent to mailed notice.

C. At a public hearing the Council shall consider the information provided by the claimant, information provided by the City staff, and testimony of interested persons testifying at the hearing.

D. The Council shall not consider any appraisal which is not in compliance with the specific requirements of Chapter 9.99.

E. If the Council determines compensation is due under Ballot Measure 7, the City shall pay the property owner the amount due or may exercise its discretion as set forth in 9.99.070.

9.99.070 Discretion to Defer City Enforcement.

A. After consideration by the Council of the notice of claim and in lieu of paying compensation to the property owner, the City may choose not to officially enforce or apply a regulation except zoning ordinances, the City's Comprehensive Plan, or Statewide Planning Goals. The application of said discretion shall not waive, limit, reduce, or restrict the right of the City to enforce said regulation at some point in the future. The application of said discretion shall not be considered a rescission, withdrawal, or repeal of said regulation. (Ord. #5044 §1, 2001)

B. Chapter 9.99 [including Section 9.99.070(A)] do not provide and shall not be interpreted to provide the City of Grants Pass with any legal authority to waive, remove, or fail to enforce or apply zoning ordinances, the City's Comprehensive Plan, or Statewide Planning Goals.
(Ord. #5044 §1, 2001)

9.99.080 Subsequent Claims.

A. If a claim is granted and paid by the City and the claimant does not appeal said amount to the Circuit Court within 90 days, or if on reconsideration an amount is set by the Circuit Court and paid by the City, the claimant and subsequent property owners may not make a subsequent claim for adoption, application or enforcement of the same regulation or a regulation which affects the same use considered and decided in the original claim.

B. If a claim is denied and the Claimant does not appeal the denial to the Circuit Court within 90 days, the claimant and subsequent property owners may not make a subsequent claim for adoption, application or enforcement of the same regulation or a regulation which affects the same use considered and decided in the original claim.

9.99.090 Errors.

A. The failure of the City to follow the procedures noted in Chapter 9.99 shall not result in a default release of the regulation, a default granting of the relief sought, or a default finding of compensation due.

B. The failure of the City to provide notice to any persons, except notice to the owner of the date of consideration by the Council of the notice of claim, shall not affect or invalidate any proceedings conducted by the City under Chapter 9.99.

9.99.100 Rights of Private Attorneys General.

If the City during its consideration of the notice of claim in its discretion chooses to defer the enforcement or application of a regulation, persons who are adversely affected by the use put to the property by the owner in violation of said regulation shall be permitted to initiate and maintain a cause of action against the owner of the property for damages in Municipal or Circuit Court.

CITY OF GRANTS PASS COMMUNITY DEVELOPMENT DEPARTMENT

FLOOD HAZARD DISTRICT
ZONING MAP AMENDMENT, SPECIAL PURPOSE DISTRICT MAP AMENDMENT AND DEVELOPMENT CODE TEXT AMENDMENT

FINDINGS OF FACT ~ CITY COUNCIL

Procedure Type:	Type IV: Planning Commission Recommendation and City Council Decision
Project Number:	09-40500004 & 09-40500006
Project Type:	Zoning Map Amendment, Special Purpose District Map Amendment and Development Code Text Amendment
Applicant:	City of Grants Pass
Planner Assigned:	Lora Glover
Application Received:	July 17, 2009
Application Complete:	July 24, 2009
Date of Staff Report:	September 14, 2009
Date of UAPC Hrng:	September 23, 2009
Date UAPC Findings of Fact Signed:	October 14, 2009
Date of City Council Hearing:	November 4, 2009
Date City Council Findings of Fact Signed:	November 18, 2009

I. PROPOSAL:

The proposal includes the following:

1) Amend the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

2) Amend Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.

3) Update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009. The revision is a modification to the narrative of the Comprehensive Plan and the change is reviewed as a minor amendment to the database in accordance with Section 13.5.2 of the Comprehensive Community Development Plan Policies document. No criteria are reviewed with the narrative change.

4) The adopting ordinance for City Council adoption repealed any conflicting or duplicate provisions contained in the Municipal Code related to flood hazard provisions.

II. AUTHORITY AND CRITERIA:

Sections 4.032, 4.042 and 4.102 of the City of Grants Pass Development Code provide the procedures for initiation of a Special Purpose District Map Amendment and Development Code Text Amendment. The proposed Special Purpose District Map Amendment and Development Code Text Amendment were initiated by the Community Development Director.

Sections 2.060, 7.040 and 7.050 authorize the Urban Area Planning Commission to make a recommendation to the City Council and authorize the City Council to make a final decision on a land use matter requiring a Type IV procedure, in accordance with procedures of Section 2.060.

The applicable criteria from the Development Code to be met include the following:

- Section 4.033 –Zoning Map Amendment
- Section 4.044 – Special Purpose District Amendment
- Section 4.103 – Development Code Text Amendment

III. APPEAL PROCEDURE:

The City Council's final decision may be appealed to the State Land Use Board of Appeals (LUBA) as provided in state statutes. A notice of intent to appeal must be filed with LUBA within twenty-one (21) days of the Council's written decision.

IV. PROCEDURE:

A. An application for a Comprehensive Plan Amendment, Flood Hazard District Zoning Map Amendment, Special Purpose District Map Amendment and Development Code Text Amendment was submitted and deemed complete on July 17, 2009. The application processed in accordance with Section 2.060 of the Development Code, and Sections III and V of the 1998 Intergovernmental Agreement.

B. Notice of the proposed amendment was mailed to the Oregon Department of Land Conservation and Development (DLCD) on July 17, 2009, in accordance with ORS 197.610 and OAR Chapter 660-Division 18.

C. Notice of the proposed amendment was mailed to Josephine County on July 17, 2009, in accordance with the 1998 Intergovernmental Agreement.

D. Notice of the September 23, 2009, Planning Commission hearing and the November 4, 2009, City Council hearing was mailed to potentially interested parties on September 3, 2009.

E. Public notice of the September 23, 2009, Planning Commission hearing, and the November 4, 2009, City Council hearing was published in the newspaper on September 19, 2009, in accordance with Sections 2.053 and 2.063 of the Development Code.

F. A public hearing was held by the Planning Commission on September 23, 2009, to consider the proposal and make a recommendation to City Council.

G. Public notice of the November 4, 2009, City Council hearing was published in the newspaper on October 28, 2009, in accordance with Sections 2.053 and 2.063 of the Development Code.

H. A public hearing was held by the City Council on November 4, 2009, to consider the matter.

V. SUMMARY OF EVIDENCE:

A. The basic facts and criteria regarding this application are contained in the staff report, which is attached as Exhibit "A" and incorporated herein.

B. The minutes of the November 4, 2009, City Council public hearing are attached as Exhibit "B" and incorporated herein.

C. PowerPoint Presentation given by staff at the November 4, 2009, public hearing is attached as Exhibit "C" and incorporated herein.

D. Letter of concern received from Sandra Loghry, dated 11/03/09, attached to the City Council Staff Report as Exhibit 3.

E. Letter of concern received from Nadine Ham, dated 11/04/09, attached to the City Council Staff Report as Exhibit 4.

VI. FINDINGS:

The City Council found that the request meets the criteria contained in Section 13.5.2 of the Comprehensive Community Development Plan Policies and the criteria contained in Sections 4.033, 4.044 & 4.103 of the Development Code based on the reasons stated in the findings below.

VII. GENERAL FINDINGS OF FACT ~ BACKGROUND AND DISCUSSION:

The City of Grants Pass participates in the National Flood Insurance Program (NFIP). By having ordinances that comply with the NFIP, residents are eligible to obtain flood insurance through the program.

FEMA has recently completed the process of updating the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) throughout the country and state, including Josephine County. Both the City of Grants Pass and Josephine County will be adopting the complete FIS and all of the FIRM maps covering Josephine County and the incorporated areas. By doing so, there will not be a need to undertake an additional amendment in the event the Urban Growth Boundary is adjusted in the future.

The purpose of the new FIS is to revise and update information on the existence and severity of flood hazards in the geographic area of Josephine County, to include the Cities of Cave Junction and Grants Pass. The original hydrologic and hydraulic analyses were performed by the U.S. Geological Survey (USGS), and completed in 1979. The countywide updated was performed by WEST Consultants, Inc., and was completed in October 2008.

On June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new study and maps must be adopted by December 3, 2009, to maintain its participation in the flood insurance program. The FIS and FIRM maps currently in effect are dated September 27, 1991. The floodway boundary and floodway maps have been incorporated into the new FIRM maps. The existing FIS and FIRM maps will be maintained for historical reference.

Failure to adopt the study and maps by December 3 means the City would be suspended from the flood insurance program effective on that date, leaving citizens at risk of flood damage that would not be covered by the National Flood Insurance Program.

Adoption of the new FIS and FIRM maps requires that Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) be amended to reference the new FIS and FIRM effective December 3, 2009. The revision is a modification to the narrative of the Comprehensive Plan and the change is reviewed as a minor amendment to the database in accordance with Section 13.5.2 of the Comprehensive Community Development Plan Policies document. No criteria are reviewed with the narrative change.

In addition to adopting the new FIS and FIRMs, FEMA's "Letter of Final Determination" states additional requirements must be met under Section 1361 of the National Flood Insurance Act of 1968, as amended, within six (6) months of the date of their letter. Specifically, the standards of Paragraph 60.3(d) of the NFIP regulations must be met. The letter goes on to list the following actions in order to be in compliance:

- Amend existing regulations to incorporate any additional requirements of Paragraph 60.3(d);
- Adopt all standards of Paragraph 60.3(d) into one new, comprehensive set of regulations; or

- Show evidence that regulations have previously been adopted that meet or exceed the minimum requirements.

The "Letter of Final Determination" included a "Summary of Map Actions" documenting previous "Letter of Map Change (LOMC) actions (including Letters of Map Amendment and Letters of Map Revision) which will be superseded by the revised FIRM panels. Many property owners will find little change in the flood information for their property, while others will be required to meet the new elevation requirements for all new structures and substantial improvements to existing structures.

An example of the existing and amended maps are provided in the City Council Staff Report.

The summary notes one LOMC for 643/645 SW Balsam Drive, Grants Pass, Oregon, which will be superseded by new detailed flood hazard information based upon revised hydrologic and hydraulic analyses. The property owners were mailed a separate notice concerning the revised FIRMs, but they have not responded as of the date of this report.

The existing regulations in Article 13 of the Development Code have been reviewed against Paragraph 60.3 (d) and the State's Model Flood Plain Ordinance for consistency. The additions and changes to Section 13.200 are reflective of the regulations from the above documents.

The Municipal Code also includes flood hazard regulations. All flood hazard provisions have been incorporated into Section 13.200 of the Development Code. The final ordinance for approval by the City Council will repeal any old ordinances and existing language that has been incorporated into the Development Code.

VIII. FINDINGS OF FACT ~ CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.033 OF THE DEVELOPMENT CODE

Criteria for Amendment. The Zoning Map may be amended by the review bodies provided that all the following criteria are met:

(1) The proposed use, if any, is consistent with the proposed Zoning District.

(2) The proposed Zoning District is consistent with the Comprehensive Plan Land Use Map designation.

(3) A demonstration that existing or proposed levels of basic urban services can accommodate the proposed or potential development without adverse impact upon the affected service area or without a change to adopted utility plans.

(4) A demonstration that the proposed amendment is consistent with the functions, capacities and performance standards of transportation facilities identified in the Master Transportation Plan.

(5) The natural features of the site are conducive to the proposed Zoning District.

(6) The proposed zone is consistent with the requirements of all overlay Districts that include the subject property.

(7) The timing of the zone change request is appropriate in terms of the efficient provision or upgrading of basic urban services versus the utilization of other buildable lands in similar zoning districts already provided with basic urban services.

(8) In the case of rezoning from the Urban Reserve District, that the criteria for conversion are met, as provided in Section 4.034.

City Council Response: Not Applicable. Although the proposed amendments do not related to zoning, it was found that review and acknowledgement of the criteria was important. The adoption of the new FIS and FIRM will result in a map change to the flood hazard, one of the special purpose districts regulated by the City of Grants Pass. The amendment affects properties along the Rogue River and Gilbert Creek. However, the above listed criteria are found not applicable to the amendment.

IX. FINDINGS OF FACT ~ CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.044 OF THE DEVELOPMENT CODE

(1) The Flood Hazard District map is the Flood Boundary – Floodway Map established by the Federal Emergency Management Agency (FEMA) in the scientific and engineering reports entitled "The Flood Insurance Study for the City of Grants Pass" and the "The Flood Insurance Study for the County of Josephine County, State of Oregon". The flood hazard district map may be amended only by FEMA in the procedure provided for Flood Boundaries – Floodway Maps.

(2) Upon receipt of proper authorization from FEMA, the Director shall begin administering the revised Flood Hazard District, as designated by FEMA.

City Council Response: Satisfied. As noted above, on June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new FIS and FIRM maps must be adopted by December 3, 2009, to maintain its participation in the flood insurance program. Upon adoption, the updated FIS, FIRM and Section 13.200 of the Development Code, will be used to regulate properties in the flood hazard area.

X. FINDINGS OF FACT ~ CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.103 OF THE DEVELOPMENT CODE

The text of the Development Code may be recommended for amendment and amended provided that all of the following criteria of Section 4.103 of the Development Code are met.

CRITERION 1: The proposed amendment is consistent with the purpose of the subject section and article.

City Council Response: Satisfied. The proposal amends Section 13.200 "Flood Hazard District". The purpose statement of Section 13.210 states that the intent of the Flood Hazard District is to designate areas that may be hazardous to development due to flooding. The District is to provide standards that specify how development will minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money;
- Minimize need for rescue and relief efforts;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities;
- Help maintain a stable tax base;
- Notify potential buyers of special flood hazard; and
- Ensure those who occupy flood hazard areas accept responsibility for their actions.

The proposed amendment is consistent with the purpose statement of Section 13.210 because it brings the Development Code into compliance with regulations of the National Flood Insurance Program (NFIP, Paragraph 60.3(d)) as required under Section 1361 of the National Flood Insurance Act of 1968, as amended.

Specifically, the proposed text amendment will:

- Consolidate various flood ordinances currently located within the Municipal Code, into one location in the Development Code;
- Provide additional terms and definitions for the flood hazard district; and
- Brings construction standards for crawlspaces and below-grade crawlspaces into compliance.

CRITERION 2: The proposed amendment is consistent with other provisions of this code.

City Council Response: Satisfied. As noted under Section 13.010 of the Development Code, special purpose districts, to include the Flood Hazard District, provide standards intended to mitigate natural hazards, to protect natural features and to mitigate land use conflicts. The standards applicable for the Flood Hazard District are in addition to the standards of the underlying zoning

district. Therefore, the proposed amendment is internally consistent with other provisions of the Development Code.

CRITERION 3: The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, and most effectively carries out those goals and policies of all alternatives considered.

City Council Response: Satisfied. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan. Section 5.2 of Element 5 of the Comprehensive Plan Policy document states that the Development Code shall:

- Regulate development within the 100-year floodplain and floodway as required to maintain participation in the National Flood Insurance Program;
- Provide methods to determine and appeal the location of the 100-year floodplain and floodway boundaries when there appears to be discrepancies between official mapped boundaries and actual field conditions.
- Facilitate flood hazard policies.

The proposed changes to Section 13.200 of the Development Code and the narrative of the Comprehensive Plan help implement the policy statements. As noted above, the narrative of Element 5 of the Comprehensive Plan (Section 5.30 ~ Flood Hazard) is being modified to reference the new FIS and FIRM effective December 3, 2009. The alternative of not adopting the new FIS, FIRM and Code sections is not a viable option as it would cause suspension with the City's participation in the NFIP.

CRITERION 4: The proposed amendment is consistent with the functions, capacities, and performance standards of transportation facilities identified in the Master Transportation Plan.

City Council Response: Not Applicable. The proposed amendments do not pertain to the performance standards of the Master Transportation Plan.

XI. DECISION:

A. The City Council **APPROVED** the amendment of the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

B. The City Council **APPROVED** the proposed amendment to Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.

C. The City Council **APPROVED** the amendment to update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009.

D. The City Council **APPROVED** the adoption of the ordinance repealing Sections 9.50-9.56 (Flood Hazard Regulations), Title 9: Land Development and Public Improvements of the Municipal Code.

The vote was 8-0-0, with Councilors Webber, Renfro, Boston, Hitchcock, Cummings, Michelon, Wheatley and Gatlin voting in favor of the request.

XII. APPROVED BY THE CITY COUNCIL this 18th day of November, 2009.

Mayor, Michael Murphy

City Council Meeting
November 4, 2009
6:00 PM
City Council Chambers

The Council of the City of Grants Pass met in regular session on the above date with Mayor Murphy presiding. The following Councilors were present: Cummings, Wheatley, Renfro, Boston, Hitchcock, Gatlin, Michelon, and Webber. Absent: None. Also present and representing the City were Interim City Manager Samson, Interim City Attorney Bartholomew, Finance Director Reeves, Deputy Chief Landis, Interim Community Director Angeli Paladino, Parks and Community Services Director Seybold, Human Resource Coordinator Lange, and sitting in for Public Works was Tim Wilson.

The Invocation was given by Councilor Gatlin, followed by the Pledge of Allegiance.

PROCLAMATIONS: None

1. PUBLIC HEARING:

a. Ordinance amending Element 5 -Natural Hazards/Flood Hazard (5.30) of the Comprehensive Plan; the Special Purpose District Map for the Flood Hazard District; Section 13.200 (Flood Hazard District) of the Development Code; and repealing Section 9.50-9.56 (Flood Hazard Regulations), Title 9: Land Development and Public Improvements of the Municipal Code.

Mayor Murphy stated, this is a legislative hearing and we will begin the hearing with a Staff report followed by a presentation by the applicant, statements from persons in favor of the applicant, statements by persons in opposition to the application, and an opportunity for additional comments by the applicant and staff. Once that has occurred, the public comment portion will be closed and the matter will be discussed and acted upon by the Council. Mayor Murphy asked if there was anyone present who wished to challenge the authority of the Council to hear this matter. Seeing none, Mayor Murphy asked if there were any Council members who wished to abstain from participating in the hearing or declare a conflict, or a potential conflict of interest. Seeing none, he asked if there were any Council members who wished to disclose discussions, contacts, or other ex parte information they received prior to the meeting regarding the application.

Seeing none, Mayor Murphy stated, in this hearing the decision of the Council will be based upon specific criteria which are set forth in the Development Code, all testimony given which apply in this case are noted in the Staff Report. If anyone would like a copy of the Staff Report, please write that in a note to me and one will be provided to you. It is important to remember that if you fail to raise an issue with enough detail to afford the Council and the parties an opportunity to respond to the issue, you will not be able to appeal to the Land Use Board of Appeals (LUBA) based on that issue. Mayor Murphy stated, the hearing will now proceed with a report from staff.

EXHIBIT B
TO CC FOF

Associate Planner Glover stated, tonight before you is an ordinance. We are recommending adoption that will provide various amendments to the Development Code and to the Comprehensive Plan, and also repeal a section from the Municipal Code all relating to the new flood studies, new flood maps that have been prepared by FEMA. Before I get started tonight I want to make a correction in your packet just to make sure that it is clear that the ordinance has a number of items referencing Exhibit A on page 5, and they are listed out and they are in the same attachment order as in your Staff report but, inadvertently, the next page 6 which is actually the beginning of the Staff report is stamped as Exhibit a. The Staff report will not be part of the ordinance, just the exhibits to it. It's just as some housecleaning, I wanted to mention that. As we go through the process tonight as we are discussing this, we did receive two letters of concern and/or objection. They are on the dais before you, and are Exhibit 3 and 4 of the Staff report. The first one is concerned about the financial impact for them, if they are required to have to do flood insurance. Right now the existing flood map shows their home is outside of the flood hazard and the new maps will show that they are inside the flood hazard. Their lender may require that they obtain flood insurance. The second letter, is from a Mrs. Hamm. She has property on Portola. The new flood maps reflect that the majority of her property is in the floodway, which will put some restrictions on her property. She had desires to partition that in a future. She if she goes to partition it in the future, she would have to come in with a flood analysis, a no-rise analysis, as part of the land division process, where under the current map she would not have to. There will be some additional upfront expenses if she proceeds to go with a partition with that property in the future. I'm not sure she wants to discuss this with you tonight but she is here if you have questions.

So again, tonight our proposal includes an ordinance adopting the following items: Amend the special purpose district map for the flood hazard district; adopt current flood insurance study's, FIS volumes 1 and 2, and the Flood Insurance Rate Maps for Josephine County and the incorporated areas of the County; amend section 13.200, the Flood Hazard District of the Development Code; update element 5 of the Comprehensive Plan, and then; repeal sections 9.50 through 9.56 of the Flood Hazard regulations of the Municipal Code. The importance of this is that we had various discussions throughout our Codes, our guidelines, and so now we are consolidating them into one location into the Development Code.

The City Of Grants Pass participates in the National Flood Insurance Program (NFIP) and, by doing so, our residents are eligible to obtain flood insurance from the program. The Federal Emergency Management Agency, which is referred to as FEMA, has recently completed a process of updating the existing maps, the 1991 flood study and the FIRM maps. The purpose of the new flood study is to revise and update the information on the existence and severity of flood hazards in Josephine County to include the incorporated areas of Cave Junction and Grants Pass. On June 3, 2009, FEMA mailed their letter of final determination instructing the City that the maps and the study must be adopted to maintain participation in the flood insurance program. The study and the maps are to be adopted no later than December 3, the effective date of the new maps. Adoption of the new study and maps requires that

Element 5 of the Comprehensive Plan be updated to reference those new maps. Currently the 1991 maps are referenced. In addition, the new study also requires that we update the Development Code, specifically the standards from paragraph 60.3(d) as the National Insurance Program regulations must be met. We had some construction standards that need to be upgraded through that. (She shows an example of the new flood maps and existing flood maps.) The existing map shows the hazards in the blue area. This is off of Lincoln and Webster Road. The new maps are colored in the yellow highlight and it shows larger areas that are outside of the flood hazard now where before we were reflecting them inside the hazard. I can't go through and highlight every map that we have tonight but we do encourage citizens to come into the office if they have specific concerns. We've been fielding quite a few phone calls and inquiries at that level on a property-by-property basis.

The NFIP has been in existence since the passage of the National Flood Insurance Act of 1968. There are over 700 communities in the Pacific Northwest alone participating in the program. In 1973, flood insurance became mandatory as a condition of any federal or federally related assistant's. FEMA conducts hydrologic and hydraulic analysis and prepares the floodplain maps provided to participating communities. The recent study was outsourced to West Inc., I believe was the name of the company that did that and completed their study last fall in 2008. The new updated maps combine the federal insurance rate maps and the federal insurance study reports for Josephine County and the incorporated communities as we mentioned. We have a countywide format now with the same flood zone references. If you are familiar with the flood zones, we had a zone "a" which had a series of numbered flood zones and now those are incorporated under zone "ae" or zone "b", which was traditionally referred to as the 500 year floodplain is now zoned "x" with a shaded and a unshaded portion. I'm sorry, zone "b" was referred to as a floodway fringe. The 100 year flood way in zone "c" was the 500 year floodway. So now we have just the single shaded or unshaded zone "x". I think it will be a little bit simpler for the insurance companies when they are calling into see which zones their properties are in.

The combination of insurance and mitigation through floodplain management provides a powerful combination to help safeguard our residents. The floodplain management, the ordinances and development standards is a mitigation device because insurance along cannot adequately protect homes and properties. Participation has benefits and consequences. Participation brings a number of benefits to the community. Our residents are able to purchase and renew flood insurance policies. The City of Grants Pass participates in a community rating system. It's a voluntary rating system that helps qualify residents for lower flood insurance premiums as a result of education, outreach, and measures to reduce flood losses. In addition the NFIP insurance provides an additional $30,000 from FEMA for _____ construction to meet current standards. FEMA also has a very good, easy to use website. People can go on to that and literally type in their address and find out if they are at risk or not, and what level of risk they are. It also has lists of insurance agents in the area that help them get their insurance coverage.

Consequences if we don't update our maps in our study programs -- if we are suspended from the program, we face the following consequences: Existing policies will not be renewed, no federal grants

or loans for buildings may be made in identified flood hazard areas. Federally backed mortgages such as Fannie Mae and Freddie Mac require NFIP insurance, which would make it difficult for a property owner to sell their property to people that need to secure loans on them. No federal disaster assistance will be provided to repair buildings in identified flood hazard areas. There is a 30 day waiting period for flood insurance to become effective. If we were to lapse and didn't enact the new ordinance in time, we would have a 30 day waiting period before we would be able to renew our status. Of course, going now into December, January or February that's in our traditional flood season. Non-FIP insurance companies will not cover more than one claim where NFIP will. The non-FIP providers are hard to find and are expensive. As an example, in the information provided, Lloyd's of London is one example. They are very expensive and have a high risk pool.

We were able to obtain, courtesy of Josephine County, some of the photographs that they had from the 1964 flood. This is the Webster and Lower River Road area which was the vicinity of the first example maps that I showed you. This is a picture of E. Park Street. You can see the bridge crossing 6th and 7th Street down there, and M Street along the north side of the picture. This is the Portola neighborhood. You can see quite a few homes down here off of Rogue Drive that are in the hazard area. Some of them had at least 6 feet of water in them.

Conformance with applicable criteria -- Section 4.033 of the Development Code for zoning map amendment is not applicable at this point as the proposed amendments do not relate to a specific zone. However, the adoption of the new flood study and the FIRM maps will result in a map change to the flood hazard, a special purpose district. The amendments affect properties along the Rogue River and Gilbert Creek. Section 4.044 of the Development Code: Our flood hazard district map. The flood boundary floodway is established by FEMA. The flood hazard map may be amended only by FEMA, and upon receipt of proper authorization from FEMA, the Director shall begin administering the revised flood hazard district as designated by FEMA. The criteria are satisfied. On June 3, as we mentioned, FEMA mailed their final letter of determination instructing the city to adopt the FIRM study and the FIRM maps. Section 4.103 of the Development Code -- the proposed amendment is consistent with the purpose of the subsection and article. This is satisfied as the proposal amends section 13.200 of the flood hazard district and is consistent with the purpose statement. The amendment will consolidate various flood ordinances located in the Municipal Code and the Development Code. It will provide additional terms and definitions for the flood hazard and bring construction standards for crawlspaces and below grade crawlspaces into compliance.

The Planning Commission recommends that the City Council approve the amendments for the special-purpose district map, that the Council approve the amendments to section 13.200 of the flood district, and the Council approve the amendment to update Element 5 of the Comprehensive Plan. As we mentioned, includes provisions to repeal pertinent sections of the Municipal Code. At this point, if you have any questions for me, I will field those for you.

Councilor Cummings asked, is there any difference in the development standards of 100 year flood area and the 500 year flood plain?

Associate Planner Glover stated, the 100 year flood area has to provide the base elevation to make sure the bottom floor is 1 foot above that base elevation. That is not required in the 500 year or the zone, I think it's the zone "x", unshaded.

Councilor Cummings asked, what happens with the 500 year fringe when it's all blended together as one zone? Do they have to live with that?

Associate Planner Glover stated, let me go back to the map and I'll show you. We have the traditional floodway, which is the "ae" zone now and then zone "x" is everything outside of that. And then the shaded, so it's kind of confusing, it's what's referred to as the 100 year, and that is the one foot elevation. So, everything else in the white is still zone "x". They have kind of thrown it all into one category. Only in the shaded areas then, would you have to meet that 1 foot elevation.

Councilor Cummings asked, so, most of the properties in that shaded area would have a flood certification so that you could verify it.

Associate Planner Glover stated, yes, they are within this yellow area where we go back to the other side in the blue, and all of those would've required... and then outside into the white area they do not.

Councilor Webber stated, I just want to confirm that there are no retroactive conditions in this proposed change from FEMA in terms of any existing structures or properties... structures on properties that are in the new designated flood zones. There is nothing that requires them to upgrade, or update, or retrofit?

Associate Planner Glover stated, that would come if they decide to remodel or rebuild, they would have to meet today's code requirements. An example, my folks' property was built to code but the flood is up higher than what we had from older map, so if they go to do anything today then they will have to elevate probably even more so than they originally had to because the flood is showing to be at a higher level. That's based on the better mapping programs that we've had with the elevations and topography maps.

Councilor Webber asked, right, but this change in designation wouldn't require them to go back and make changes to maintain their insurance?

Associate Planner Glover stated, no, but it gives them the opportunity now if they want to purchase their flood insurance now, or if they did have a loan on the house, they would be required to get flood

insurance today, well, December 3, where today they wouldn't be.

Mayor Murphy asked if there were any further questions for staff. Seeing none, he opened it for public comment. Seeing none, he closed public comment and returned it to the Council.

Councilor Renfro stated, I should have asked this while you were still up there Associate Planner Glover but do you know if there are any programs available for low or fixed income people that are going to be required to have insurance... to help them on the insurance?

Associate Planner Glover stated, no, that is a discussion that Senior Planner Tom Schauer and I had just briefly this evening before we started that we hadn't thought to look into that, and it would be worthwhile for us to do, so I will put that on my list to see if we can find some information and direct people a certain way. I'm assuming at this point their insurance provider might be able to do that for them, but it would be nice to have that information available at the office.

Councilor Boston stated, well, that answers part of what I was thinking about. I'm not sure whether we have the Staff resources, but I would be grateful if people like these letter writers and others could get help from your office... one, to understand why their status is changed and perhaps have guidance of how they might appeal it. Is there any appeal process? Answer that and then I want to follow up.

Associate Planner Glover stated, there are two approaches in a sense. If you're talking about appealing your decision, that would be through the Land Use Board of Appeals, through Salem, but for individual properties?

Councilor Boston interrupted, individual properties going back to FEMA saying, "We think you did this...".

Associate Planner Glover stated, interrupted, they would go through a process referred to as a map amendment. Their surveyor would provide elevation information to show that they are above that hazard area, and we can do that. There was a reference in the report about some of those previous map amendments being incorporated into the new study or not, so there are approaches to do that with FEMA.

Councilor Boston continued, and you could help guide people into how to do that process, I gather. That, plus exploring and having available information on folks that have a particular hardship and see if there are any sources to mitigate, I think we essentially have to do this. I think it is an overall good thing that there are individuals that are obviously going to find it very difficult, and if we can help them work that through, I would be very pleased.

Councilor Webber stated, I just want to put into the record that we have received these letters and I certainly understand the concerns, and especially from the elderly couple on a fixed income and concerned about how this affects them, but recognizing that my concern or compassion for them doesn't override the power of the Federal government and this report is going to come either way. I certainly have sympathies for them, but believe this is something we need to do for the good of the community. I would move for the first reading of the ordinance.

Councilor Renfro seconded the motion.

Mayor Murphy called for further discussion. Seeing none, he called for a vote.

ORDINANCE NO. 5498

Councilor Webber moves that the Council adopt the ordinance by the first reading. The motion seconded by Councilor Renfro. The vote resulted as follows: "AYES": Wheatley, Renfro, Boston, Hitchcock, Cummings, Webber, Gatlin, and Michelon. "NAYS": None. Abstain: None. Absent: None. The ordinance is read.

Councilor Cummings moves that the ordinance be read by title only, second reading. The motion seconded by Councilor Wheatley. The vote resulted as follows: "AYES": Wheatley, Renfro, Boston, Hitchcock, Cummings, Webber, Gatlin, and Michelon. "NAYS": None. Abstain: None. Absent: None. The ordinance is read.

Mayor Murphy stated, for about 20 years, at this point we just called for a vote but it has been pointed out to me that we probably should have a motion before we do that, so starting tonight we are doing this slightly differently. I need a motion to adopt the ordinance.

Councilor Cummings stated, I will make a motion that we adopt the ordinance. Councilor Renfro seconded the motion and Mayor Murphy called for a vote.

Mayor Murphy asks if the ordinance should be adopted, signified by roll call vote as follows: Councilor Michelon - yes; Councilor Wheatley- yes; Councilor Cummings- yes; Councilor Webber- yes; Councilor Boston- yes; Councilor Hitchcock- yes; Councilor Gatlin- yes; Councilor Renfro- yes.

Mayor Murphy declares Ordinance Number 5498 is adopted.

b. ~~Ordinance~~ (1) amending the Development Code and Comprehensive Plan to revise provisions governing the Urban Area Planning Commission, (2) amending the Development Code to revise the timeframe for issuance of a Director's interpretation, and (3) repealing Ordinance 4399 and Resolution 4126.

Mayor Murphy stated, we have already given notice for a land use hearing. Does anybody have any abstentions or conflict of interest they want to declare on that? Seeing none, are we okay with just doing that much? [He was advised that it was all right, off microphone.]

6. EXECUTIVE SESSION 192.660 (2)(h): To consult with counsel concerning the legal rights and duties of a public body with regard to current litigation or litigation likely to be filed.

MOTION

It was moved by Councilor Renfro and seconded by Councilor Gatlin to go into executive session. The vote resulted as follows: Renfro, Cummings, Michelon, Wheatley, Hitchcock, Gatlin, Boston and Webber. "NAYS": None. Abstain: None. Absent: None. The motion has passed.

Interim City Attorney Bartholomew stated, the Council will now meet in executive session for the purpose of discussing those subjects previously noticed for this session. This executive session is held pursuant to ORS 192.660, and more specifically, under the sections of that statute which had been publically noticed for this meeting. Representatives of the news media and designated Staff are allowed to attend the executive session. All other members of the audience are asked to leave the room. Representatives of the news media are specifically directed not to report on any of the deliberations during the executive session, except to state the general subject of the session as previously announced. No decision making will be made in executive session. At the end of executive session, we will return to open session and welcome the audience back into the room.

MOTION

It was moved by Councilor Gatlin and seconded by Councilor Renfro to go out of executive session. The vote resulted as follows: Renfro, Cummings, Michelon, Wheatley, Hitchcock, Gatlin, Boston and Webber. "NAYS": None. Abstain: None. Absent: None. The motion has passed.

7. ADJOURN:

There being no further business to come before the Council, Mayor Murphy adjourned the meeting at 8:30 p.m

The ordinances, resolutions, and motions contained herein and the accompanying votes have been verified by:

_____

Finance Director

These minutes were prepared by contracted minute taker, Wendy Hain.

FLOOD HAZARD DISTRICT ZONING MAP AMENDMENT, SPECIAL PURPOSE DISTRICT MAP AMENDMENT, DEVELOPMENT CODE TEXT AMENDMENT

- Applicant: City of Grants Pass
- Project No.: 09-40500004 & 09-40500006
- Procedure: Type IV~ Planning Commission Recommendation and City Council Decision
- Planner: Tom Schauer/Lora Glover

Proposal:

EXHIBIT 2 TO ORDINANCE

- The proposal includes an Ordinance adopting the following:
  - Amend the Special Purpose District Map for the Flood Hazard District ~ adopt current Flood Insurance Study (FIS) Volume 1 & 2; and Flood Insurance Rate Maps (FIRMs) for Josephine County.
  - Amend Section 13.200 (Flood Hazard District) of the Development Code.
  - Update Element 5 of the Comprehensive Plan (Section 5.30) to reference new FIS and FIRMs effective December 3, 2009.
  - Repeal Sections 9.50-9.56 (Flood Hazard Regulations), Title 9 of the Municipal Code.

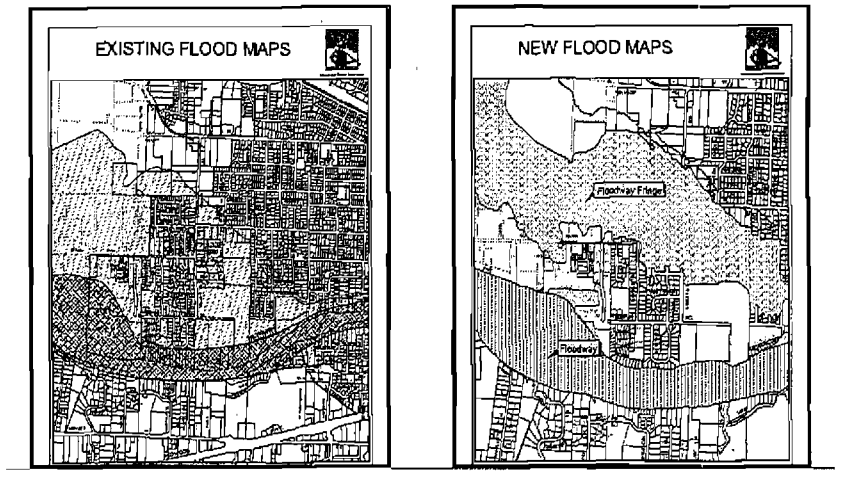
Discussion

- The City of Grants Pass participates in the National Flood Insurance Program (NFIP). By doing so, residents are eligible to obtain flood insurance from the program.
- The Federal Emergency Management Agency (FEMA) has recently completed the process of updating the 1991 FIS/FIRMs.
- The purpose of the new FIS is to revise and update information on the existence and severity of flood hazards in Josephine County (to include the incorporated areas of Cave Junction and Grants Pass).

Discussion, cont.

- On June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new maps and study must be adopted to maintain participation in the flood insurance program no later than December 3, 2009.
- Adoption of the new FIS/FIRMs requires that Element 5 of the Comprehensive Plan be updated to reference the new FIS/FIRMs dated 12/3/09.
- In addition, the new FIS requires the update of the Development Code. Specifically, the standards of Paragraph 60.3(d) of the NFIP regulations must be met.

Existing and New Maps
Lincoln Road Area



NFIP Summary

- The NFIP has been in existence since the passage of the National Flood Insurance Act of 1968.
- There are over 700 communities in the Pacific Northwest participating in the program.
- In 1973, flood insurance became mandatory as a condition of any Federal or Federally-related assistance.
- FEMA conducts hydrologic and hydraulic analyses and prepares the floodplain maps provided to participating communities.

NFIP Summary, cont.

- The countywide update was completed 11/08 by WEST Consultants, Inc., for FEMA.
- The update combined the Flood Insurance Rate Maps and Flood Insurance Study reports for Josephine County and the incorporated communities into a countywide format.
- The previous Flood Boundary and Floodway Maps (FBFMs) have been eliminated. Flood hazard areas previously numbered as Zone A have been changed to Zone AE. Zone B was changed to Zone X (shaded) and Zone C was changed to Zone X (unshaded).

NFIP Summary, cont.

- The combination of insurance and mitigation through floodplain management provides a power combination to help safeguard our residents.
- Floodplain management (via ordinances and development standards) is a mitigation device.
- Insurance alone cannot adequately protect homes and properties.

Participation Benefits/Consequences

- Participation in the NFIP brings a number of benefits to the community:
  - Residents are able to purchase and renew NFIP flood insurance policies.
  - The City of Grants Pass participates in the Community Rating System, a voluntary rating system that qualifies residents for lower flood insurance premiums as a result of education, outreach and measures to reduce flood losses.
  - NFIP insurance provides an additional $30,000 from FEMA for reconstruction to meet current standards.

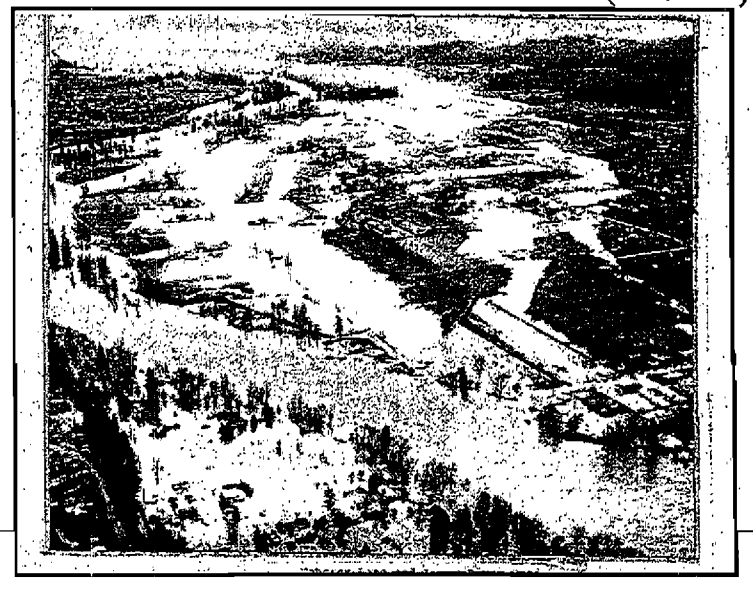
Participation Benefits/Consequences, cont.

- If we are suspended from the program, we face the following consequences:
  - Existing policies will not be renewed.
  - No Federal grants or loans for buildings may be made in identified flood hazard areas; federally backed mortgages (Fannie Mae, Freddie Mac, FHA) require NFIP insurance.
  - No Federal disaster assistance may be provided to repair buildings in identified flood hazard areas;

Participation Benefits/Consequences, cont.

- There is a 30-day waiting period for flood insurance to become effective.
- Non-NFIP insurance companies will not cover more than one claim (NFIP will).
- Non-NFIP providers are hard to find and are expensive (Lloyd's of London is one example). They have a very small, high-risk pool.

Webster & Lower River Road (12/64)



East Park Street

Portola Area

Conformance with Applicable Criteria

- Section 4.033 of the Development Code
  - Zoning Map Amendment ~ Not Applicable. The proposed amendments do not relate to a specific zone. However, the adoption of the new FIS and FIRM maps will result in a map change to the flood hazard (a special purpose district). The amendments affect properties along Gilbert Creek and the Rogue River.

Conformance with Applicable Criteria

- Section 4.044 of the Development Code
  - Flood Hazard District Map ~ Satisfied.
    - Flood Boundary-Floodway Map is established by FEMA;
    - The flood hazard district map may be amended only by FEMA;
    - Upon receipt of proper authorization from FEMA, the Director shall being administering the revised Flood Hazard District, as designated by FEMA.
      - On June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City to adopt the new FIS & FIRM maps by 12/3/09.

Conformance with Applicable Criteria

- Section 4.103 of the Development Code
  - The proposed amendment is consistent with the purpose of the subject section and article ~ Satisfied. The proposal amends Section 13.200 "Flood Hazard District" and is consistent with the purpose statement. The amendment will:
    - Consolidate various flood ordinances located in the Municipal Code and the Development Code;
    - Provide additional terms and definitions for the flood hazard;
    - Bring construction standards for crawlspaces and below-grade crawlspaces into compliance.

Planning Commission Recommends:

- The City Council **APPROVE** the proposed amendment to the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).
- The City Council **APPROVE** the proposed amendment to Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.
- The City Council **APPROVE** the amendment to update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009.

CITY OF GRANTS PASS COMMUNITY DEVELOPMENT DEPARTMENT

FLOOD HAZARD DISTRICT
ZONING MAP AMENDMENT, SPECIAL PURPOSE DISTRICT MAP AMENDMENT AND DEVELOPMENT CODE TEXT AMENDMENT

STAFF REPORT ~ CITY COUNCIL

Procedure Type:	Type IV: Planning Commission Recommendation and City Council Decision
Project Number:	09-40500004 & 09-40500006
Project Type:	Zoning Map Amendment, Special Purpose District Map Amendment and Development Code Text Amendment
Applicant:	City of Grants Pass
Planner Assigned:	Lora Glover
Application Received:	July 17, 2009
Application Complete:	July 24, 2009
Date of Staff Report:	September 14, 2009
Date of UAPC Hrng:	September 23, 2009
Date UAPC Findings of Fact Signed:	October 14, 2009
Date of City Council Hearing:	November 4, 2009

I. PROPOSAL:

The proposal includes the following:

1) Amend the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

2) Amend Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.

3) Update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009. The revision is a modification to the narrative of the Comprehensive Plan and the change is reviewed as a minor amendment to the database in accordance with Section 13.5.2 of the Comprehensive Community Development Plan Policies document. No criteria are reviewed with the narrative change.

EXHIBIT A
TO CC FOF

4) The adopting ordinance for City Council adoption will repeal any conflicting or duplicate provisions contained in the Municipal Code related to flood hazard provisions.

II. AUTHORITY AND CRITERIA:

Sections 4.032, 4.042 and 4.102 of the City of Grants Pass Development Code provide the procedures for initiation of a Special Purpose District Map Amendment and Development Code Text Amendment. The proposed Special Purpose District Map Amendment and Development Code Text Amendment were initiated by the Community Development Director.

Sections 2.060, 7.040 and 7.050 authorize the Urban Area Planning Commission to make a recommendation to the City Council and authorize the City Council to make a final decision on a land use matter requiring a Type IV procedure, in accordance with procedures of Section 2.060.

The applicable criteria from the Development Code to be met include the following:

- Section 4.033 –Zoning Map Amendment
- Section 4.044 – Special Purpose District Amendment
- Section 4.103 – Development Code Text Amendment

III. APPEAL PROCEDURE:

The City Council's final decision may be appealed to the State Land Use Board of Appeals (LUBA) as provided in state statutes. A notice of intent to appeal must be filed with LUBA within twenty-one (21) days of the Council's written decision.

IV. BACKGROUND AND DISCUSSION:

Detailed background and discussion are provided in the Planning Commission's Findings of Fact. The Planning Commission recommends the City Council approve the proposed amendments.

V. CONFORMANCE WITH APPLICABLE CRITERIA:

The Planning Commission found that the request was in conformance with the criteria contained in Section 13.5.2 of the Comprehensive Community Development Plan Policies and the criteria contained in Sections 4.033, 4.044 & 4.103 of the Development Code.

VI. RECOMMENDATION:

The Urban Area Planning Commission found that the request meets the criteria contained in Section 13.5.2 of the Comprehensive Community Development Plan Policies and the criteria contained in Sections 4.033, 4.044 & 4.103 of the Development Code, and recommends the City Council:

1. Approve the amendment of the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA);

2. Approve the amendment to Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions; and

3. Approve the amendment to update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009.

VII. CITY COUNCIL ACTION:

A. Positive Action:

1. Approve the proposal as recommended.
2. Approve the proposal with revisions (list):

B. Negative Action: deny the request and adopt no amendments for the following reasons (list):

C. Postponement: Continue item

1. Indefinitely.
2. To a date and time certain.

VIII. INDEX TO EXHIBITS:

1. Planning Commission's Findings of Fact and the Attached Record.

Index to Exhibits:

A. UAPC Staff Report:

1. Flood Insurance Study (FIS) for Josephine County, Oregon and Incorporated areas, dated December 3, 2009 (full report is available in the Planning file).

2. Flood Insurance Rate Maps (FIRM) dated December 3, 2009 (full set of maps is available in the Community Development office).

3. Revised Section 13.200 ~ Flood Hazard District Development Code.

4. Revised Element 5, Section 5.30, Flood Hazard located in the Comprehensive Plan.

5. FEMA's "Letter of Final Determination" dated June 3, 2009.

B. Minutes from September 23, 2009, UAPC hearing

C. PowerPoint Presentation

2. Revised Title 9 of the Municipal Code (full text is available in the Planning file).

3. Letter of concern received from Sandra Loghry, dated 11/03/09.

4. Letter of concern received from Nadine Ham, dated 11/04/09.

NOTE: The application is not subject to the 120 day requirement per ORS 227.178.

CITY OF GRANTS PASS COMMUNITY DEVELOPMENT DEPARTMENT

FLOOD HAZARD DISTRICT
ZONING MAP AMENDMENT, SPECIAL PURPOSE DISTRICT MAP AMENDMENT AND DEVELOPMENT CODE TEXT AMENDMENT

FINDINGS OF FACT ~ URBAN AREA PLANNING COMMISSION

Procedure Type:	Type IV: Planning Commission Recommendation and City Council Decision
Project Number:	09-40500004 & 09-40500006
Project Type:	Zoning Map Amendment, Special Purpose District Map Amendment and Development Code Text Amendment
Applicant:	City of Grants Pass
Planner Assigned:	Lora Glover
Application Received:	July 17, 2009
Application Complete:	July 24, 2009
Date of Staff Report:	September 14, 2009
Date of UAPC Hrng:	September 23, 2009
Date Findings of Fact Signed:	October 14, 2009

I. PROPOSAL:

The proposal includes the following:

1) Amend the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

2) Amend Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.

3) Update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009. The revision is a modification to the narrative of the Comprehensive Plan and the change is reviewed as a minor amendment to the database in accordance with Section 13.5.2 of the Comprehensive Community Development Plan Policies document. No criteria are reviewed with the narrative change.

4) The adopting ordinance for City Council adoption will repeal any conflicting or duplicate provisions contained in the Municipal Code related to flood hazard provisions.

EXHIBIT 1
TO CC STAFF REPORT

II. AUTHORITY AND CRITERIA:

Sections 4.032, 4.042 and 4.102 of the City of Grants Pass Development Code provide the procedures for initiation of a Special Purpose District Map Amendment and Development Code Text Amendment. The proposed Special Purpose District Map Amendment and Development Code Text Amendment were initiated by the Community Development Director.

Sections 2.060, 7.040 and 7.050 authorize the Urban Area Planning Commission to make a recommendation to the City Council and authorize the City Council to make a final decision on a land use matter requiring a Type IV procedure, in accordance with procedures of Section 2.060.

The applicable criteria from the Development Code to be met include the following:

- Section 4.033 –Zoning Map Amendment
- Section 4.044 – Special Purpose District Amendment
- Section 4.103 – Development Code Text Amendment

III. APPEAL PROCEDURE:

The City Council's final decision may be appealed to the State Land Use Board of Appeals (LUBA) as provided in state statutes. A notice of intent to appeal must be filed with LUBA within twenty-one (21) days of the Council's written decision.

IV. PROCEDURE:

A. An application for a Comprehensive Plan Amendment, Flood Hazard District Zoning Map Amendment, Special Purpose District Map Amendment and Development Code Text Amendment was submitted and deemed complete on July 17, 2009. The application processed in accordance with Section 2.060 of the Development Code, and Sections III and V of the 1998 Intergovernmental Agreement.

B. Notice of the proposed amendment was mailed to the Oregon Department of Land Conservation and Development (DLCD) on July 17, 2009, in accordance with ORS 197.610 and OAR Chapter 660-Division 18.

C. Notice of the proposed amendment was mailed to Josephine County on July 17, 2009, in accordance with the 1998 Intergovernmental Agreement.

D. Notice of the September 23, 2009, Planning Commission hearing was mailed to potentially interested parties on September 3, 2009.

E. Public notice of the September 23, 2009, Planning Commission hearing was published in the newspaper on September 19, 2009, in accordance with Sections 2.053 and 2.063 of the Development Code.

F. A public hearing was held by the Planning Commission on September 23, 2009, to consider the proposal and make a recommendation to City Council.

V. SUMMARY OF EVIDENCE:

A. The basic facts and criteria regarding this application are contained in the staff report, which is attached as Exhibit "A" and incorporated herein.

B. The minutes of the September 23, 2009, Urban Area Planning Commission public hearing are attached as Exhibit "B" and incorporated herein.

C. The PowerPoint Presentation given by staff at the September 23, 2009, public hearing is attached as Exhibit "C" and incorporated herein.

VI. FINDINGS:

The Urban Area Planning Commission found that the request meets the criteria contained in Section 13.5.2 of the Comprehensive Community Development Plan Policies and the criteria contained in Sections 4.033, 4.044 & 4.103 of the Development Code based on the reasons stated in the findings below. The vote was 7-0-0, with Commissioners Berlant, Kellenbeck, Arthur, Fowler, Fitzgerald, Fedosky and Richardson in favor. (Note: There is currently one vacancy on the commission.)

VII. GENERAL FINDINGS OF FACT ~ BACKGROUND AND DISCUSSION:

The City of Grants Pass participates in the National Flood Insurance Program (NFIP). By having ordinances that comply with the NFIP, residents are eligible to obtain flood insurance through the program.

FEMA has recently completed the process of updating the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) throughout the country and state, including Josephine County. Both the City of Grants Pass and Josephine County will be adopting the complete FIS and all of the FIRM maps covering Josephine County and the incorporated areas. By doing so, there will not be a need to undertake an additional amendment in the event the Urban Growth Boundary is adjusted in the future.

The purpose of the new FIS is to revise and update information on the existence and severity of flood hazards in the geographic area of Josephine County, to include the Cities of Cave Junction and Grants Pass. The original hydrologic and hydraulic analyses were performed by the U.S. Geological Survey (USGS), and completed in

1979. The countywide updated was performed by WEST Consultants, Inc., and was completed in October 2008.

On June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new study and maps must be adopted by December 3, 2009, to maintain its participation in the flood insurance program. The FIS and FIRM maps currently in effect are dated September 27, 1991. The floodway boundary and floodway maps have been incorporated into the new FIRM maps. The existing FIS and FIRM maps will be maintained for historical reference.

Failure to adopt the study and maps by December 3 means the City would be suspended from the flood insurance program effective on that date, leaving citizens at risk of flood damage that would not be covered by the National Flood Insurance Program.

Adoption of the new FIS and FIRM maps requires that Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) be amended to reference the new FIS and FIRM effective December 3, 2009. The revision is a modification to the narrative of the Comprehensive Plan and the change is reviewed as a minor amendment to the database in accordance with Section 13.5.2 of the Comprehensive Community Development Plan Policies document. No criteria are reviewed with the narrative change.

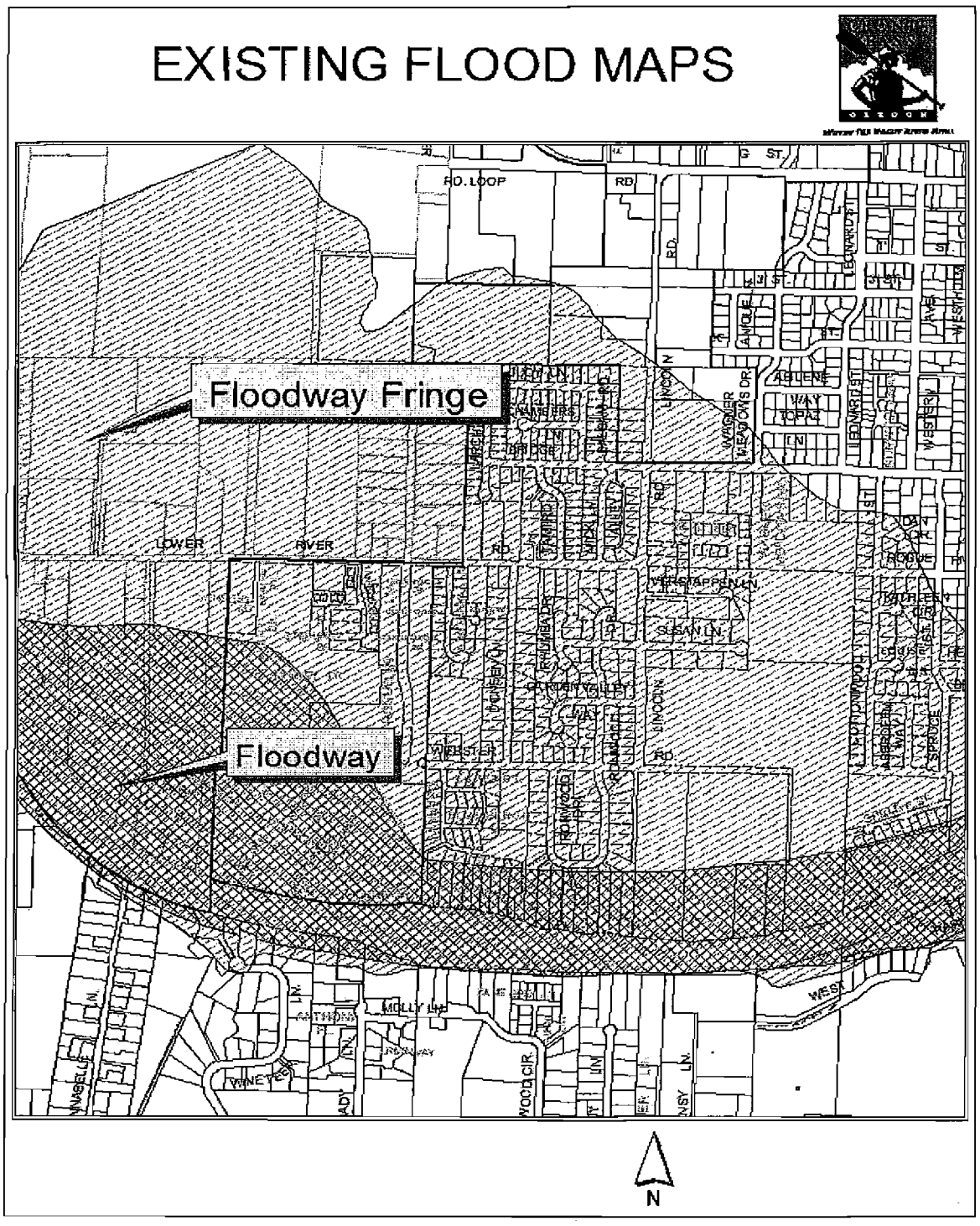
In addition to adopting the new FIS and FIRMs, FEMA's "Letter of Final Determination" states additional requirements must be met under Section 1361 of the National Flood Insurance Act of 1968, as amended, within six (6) months of the date of their letter. Specifically, the standards of Paragraph 60.3(d) of the NFIP regulations must be met. The letter goes on to list the following actions in order to be in compliance:

- Amend existing regulations to incorporate any additional requirements of Paragraph 60.3(d);
- Adopt all standards of Paragraph 60.3(d) into one new, comprehensive set of regulations; or
- Show evidence that regulations have previously been adopted that meet or exceed the minimum requirements.

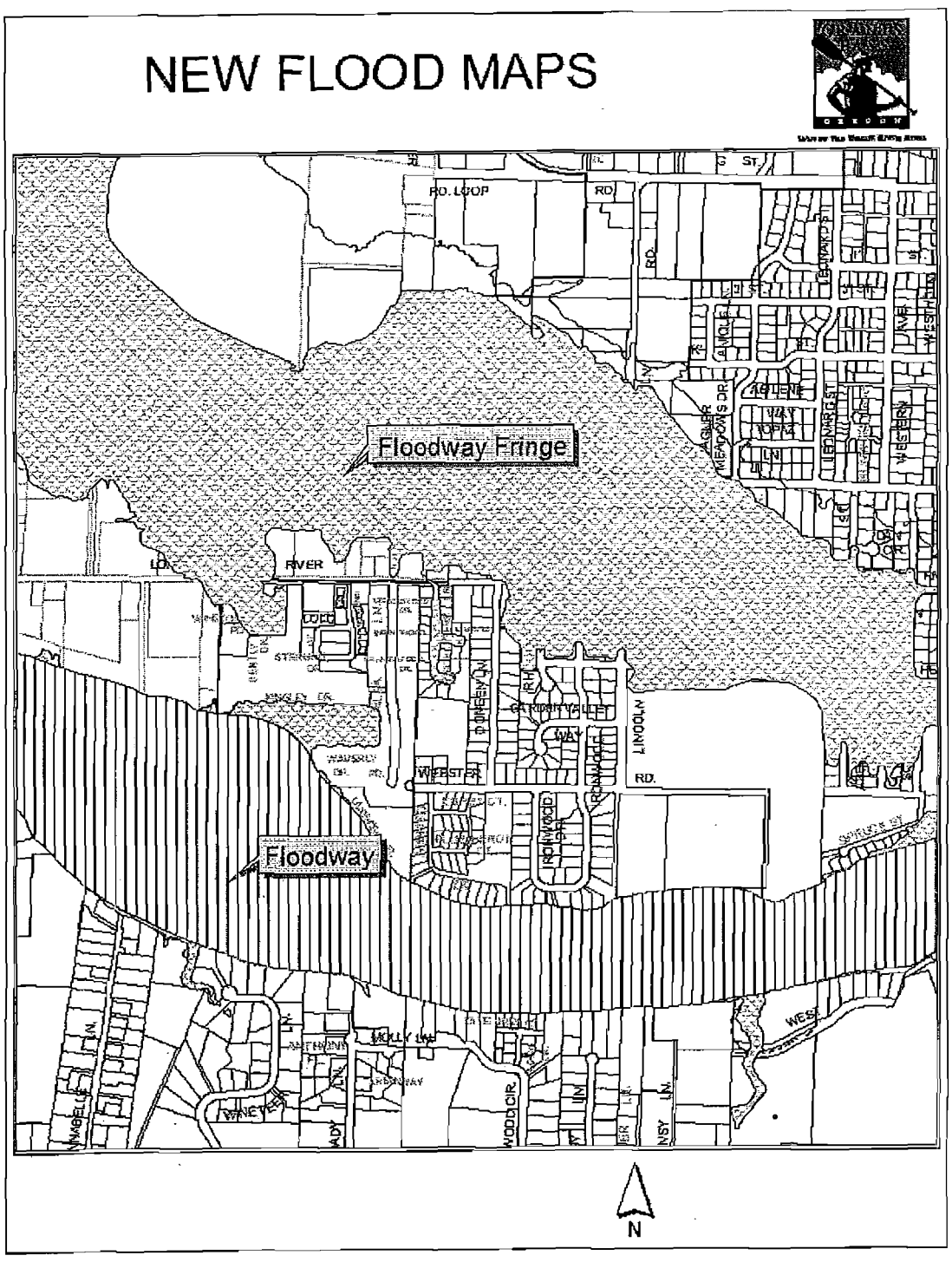
The "Letter of Final Determination" included a "Summary of Map Actions" documenting previous "Letter of Map Change (LOMC) actions (including Letters of Map Amendment and Letters of Map Revision) which will be superseded by the revised FIRM panels. Many property owners will find little change in the flood information for their property, while others will be required to meet the new elevation requirements for all new structures and substantial improvements to existing structures.

An example of the existing and amended maps is provided:

EXISTING FLOOD MAPS



NEW FLOOD MAPS



The summary notes one LOMC for 643/645 SW Balsam Drive, Grants Pass, Oregon, which will be superseded by new detailed flood hazard information based upon revised hydrologic and hydraulic analyses. The property owners were mailed a separate notice concerning the revised FIRMs, but they have not responded as of the date of this report.

The existing regulations in Article 13 of the Development Code have been reviewed against Paragraph 60.3 (d) and the State's Model Flood Plain Ordinance for consistency. The additions and changes to Section 13.200 are reflective of the regulations from the above documents.

The Municipal Code also includes flood hazard regulations. All flood hazard provisions have been incorporated into Section 13.200 of the Development Code. The final ordinance for approval by the City Council will repeal any old ordinances and existing language that has been incorporated into the Development Code.

VIII. FINDINGS OF FACT ~ CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.033 OF THE DEVELOPMENT CODE

Criteria for Amendment. The Zoning Map may be amended by the review bodies provided that all the following criteria are met:

(1) The proposed use, if any, is consistent with the proposed Zoning District.

(2) The proposed Zoning District is consistent with the Comprehensive Plan Land Use Map designation.

(3) A demonstration that existing or proposed levels of basic urban services can accommodate the proposed or potential development without adverse impact upon the affected service area or without a change to adopted utility plans.

(4) A demonstration that the proposed amendment is consistent with the functions, capacities and performance standards of transportation facilities identified in the Master Transportation Plan.

(5) The natural features of the site are conducive to the proposed Zoning District.

(6) The proposed zone is consistent with the requirements of all overlay Districts that include the subject property.

(7) The timing of the zone change request is appropriate in terms of the efficient provision or upgrading of basic urban services versus the utilization of other buildable lands in similar zoning districts already provided with basic urban services.

(8) In the case of rezoning from the Urban Reserve District, that the criteria for conversion are met, as provided in Section 4.034.

Planning Commission Response: Not Applicable. Although the proposed amendments do not related to zoning, it was found that review and acknowledgement of the criteria was important. The adoption of the new FIS and FIRM will result in a map change to the flood hazard, one of the special purpose districts regulated by the City of Grants Pass. The amendment affects properties along the Rogue River and Gilbert Creek. However, the above listed criteria are found not applicable to the amendment.

IX. FINDINGS OF FACT ~ CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.044 OF THE DEVELOPMENT CODE

(1) The Flood Hazard District map is the Flood Boundary – Floodway Map established by the Federal Emergency Management Agency (FEMA) in the scientific and engineering reports entitled "The Flood Insurance Study for the City of Grants Pass" and the "The Flood Insurance Study for the County of Josephine County, State of Oregon". The flood hazard district map may be amended only by FEMA in the procedure provided for Flood Boundaries – Floodway Maps.

(2) Upon receipt of proper authorization from FEMA, the Director shall begin administering the revised Flood Hazard District, as designated by FEMA.

Planning Commission Response: Satisfied. As noted above, on June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new FIS and FIRM maps must be adopted by December 3, 2009, to maintain its participation in the flood insurance program. Upon adoption, the updated FIS, FIRM and Section 13.200 of the Development Code, will be used to regulate properties in the flood hazard area.

X. FINDINGS OF FACT ~ CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.103 OF THE DEVELOPMENT CODE

The text of the Development Code may be recommended for amendment and amended provided that all of the following criteria of Section 4.103 of the Development Code are met.

CRITERION 1: The proposed amendment is consistent with the purpose of the subject section and article.

Planning Commission Response: Satisfied. The proposal amends Section 13.200 "Flood Hazard District". The purpose statement of Section 13.210 states that the intent of the Flood Hazard District is to designate areas that may be hazardous to development due to flooding. The District is to provide standards that specify how development will minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money;
- Minimize need for rescue and relief efforts;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities;
- Help maintain a stable tax base;
- Notify potential buyers of special flood hazard; and
- Ensure those who occupy flood hazard areas accept responsibility for their actions.

The proposed amendment is consistent with the purpose statement of Section 13.210 because it brings the Development Code into compliance with regulations of the National Flood Insurance Program (NFIP, Paragraph 60.3(d)) as required under Section 1361 of the National Flood Insurance Act of 1968, as amended.

Specifically, the proposed text amendment will:

- Consolidate various flood ordinances currently located within the Municipal Code, into one location in the Development Code;
- Provide additional terms and definitions for the flood hazard district; and
- Brings construction standards for crawlspaces and below-grade crawlspaces into compliance.

CRITERION 2: The proposed amendment is consistent with other provisions of this code.

Planning Commission Response: Satisfied. As noted under Section 13.010 of the Development Code, special purpose districts, to include the Flood Hazard District, provide standards intended to mitigate natural hazards, to protect natural features and to mitigate land use conflicts. The standards applicable for the Flood Hazard District are in addition to the standards of the underlying zoning district. Therefore, the proposed amendment is internally consistent with other provisions of the Development Code.

CRITERION 3: The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, and most effectively carries out those goals and policies of all alternatives considered.

Planning Commission Response: Satisfied. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan. Section 5.2 of Element 5 of the Comprehensive Plan Policy document states that the Development Code shall:

- Regulate development within the 100-year floodplain and floodway as required to maintain participation in the National Flood Insurance Program;
- Provide methods to determine and appeal the location of the 100-year floodplain and floodway boundaries when there appears to be discrepancies between official mapped boundaries and actual field conditions.
- Facilitate flood hazard policies.

The proposed changes to Section 13.200 of the Development Code and the narrative of the Comprehensive Plan help implement the policy statements. As noted above, the narrative of Element 5 of the Comprehensive Plan (Section 5.30 ~ Flood Hazard) is being modified to reference the new FIS and FIRM effective December 3, 2009. The alternative of not adopting the new FIS, FIRM and Code sections is not a viable option as it would cause suspension with the City's participation in the NFIP.

CRITERION 4: The proposed amendment is consistent with the functions, capacities, and performance standards of transportation facilities identified in the Master Transportation Plan.

Planning Commission Response: Not Applicable. The proposed amendments do not pertain to the performance standards of the Master Transportation Plan.

XI. RECOMMENDATION:

A. The Urban Area Planning Commission recommends that City Council **APPROVE** the amendment of the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

B. The Urban Area Planning Commission recommends that City Council **APPROVE** the proposed amendment to Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.

C. The Urban Area Planning Commission recommends that City Council **APPROVE** the amendment to update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009.

XII. **APPROVED BY THE URBAN AREA PLANNING COMMISSION** this 14th day of October, 2009.

Commissioner Gary Berlant, Chair

NOTE: The application is not subject to the 120 day requirement per ORS 227.178.

CITY OF GRANTS PASS COMMUNITY DEVELOPMENT DEPARTMENT

FLOOD HAZARD DISTRICT
ZONING MAP AMENDMENT, SPECIAL PURPOSE DISTRICT MAP AMENDMENT AND DEVELOPMENT CODE TEXT AMENDMENT

STAFF REPORT-URBAN AREA PLANNING COMMISSION

Procedure Type:	Type IV: Planning Commission Recommendation and City Council Decision
Project Number:	09-40500004 & 09-40500006
Project Type:	Zoning Map Amendment, Special Purpose District Map Amendment and Development Code Text Amendment
Applicant:	City of Grants Pass
Planner Assigned:	Lora Glover
Application Received:	July 17, 2009
Application Complete:	July 24, 2009
Date of Staff Report:	September 14, 2009
Date of UAPC Hrng:	September 23, 2009

I. PROPOSAL:

The proposal includes the following:

1) Amend the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA). ***See Exhibit 1*** for FIS and ***See Exhibit 2*** for FIRMs **Note:** FIS Volume 1 is attached in its entirety; Volume 2 contains all the flood profiles and is available at the Community Development office for review.

2) Amend Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions. ***See Exhibit 3***

3) Update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009. The revision is a modification to the narrative of the Comprehensive Plan and the change is reviewed as a minor amendment to the database in accordance with Section 13.5.2 of the Comprehensive Community Development Plan Policies document. No criteria are reviewed with the narrative change. ***See Exhibit 4***

4) The adopting ordinance for City Council adoption will repeal any conflicting or duplicate provisions contained in the Municipal Code related to flood hazard provisions.

EXHIBIT A
To UAPC/FOF

II. AUTHORITY AND CRITERIA:

Sections 4.032, 4.042 and 4.102 of the City of Grants Pass Development Code provide the procedures for initiation of a Special Purpose District Map Amendment and Development Code Text Amendment. The proposed Special Purpose District Map Amendment and Development Code Text Amendment were initiated by the Community Development Director.

Sections 2.060, 7.040 and 7.050 authorize the Urban Area Planning Commission to make a recommendation to the City Council and authorize the City Council to make a final decision on a land use matter requiring a Type IV procedure, in accordance with procedures of Section 2.060.

The applicable criteria from the Development Code to be met include the following:

- Section 4.033 –Zoning Map Amendment
- Section 4.044 – Special Purpose District Amendment
- Section 4.103 – Development Code Text Amendment

III. APPEAL PROCEDURE:

The City Council's final decision may be appealed to the State Land Use Board of Appeals (LUBA) as provided in state statutes. A notice of intent to appeal must be filed with LUBA within twenty-one (21) days of the Council's written decision.

IV. BACKGROUND AND DISCUSSION:

The City of Grants Pass participates in the National Flood Insurance Program (NFIP). By having ordinances that comply with the NFIP, residents are eligible to obtain flood insurance through the program.

FEMA has recently completed the process of updating the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) throughout the country and state, including Josephine County. Both the City of Grants Pass and Josephine County will be adopting the complete FIS and all of the FIRM maps covering Josephine County and the incorporated areas. By doing so, there will not be a need to undertake an additional amendment in the event the Urban Growth Boundary is adjusted in the future.

The purpose of the new FIS is to revise and update information on the existence and severity of flood hazards in the geographic area of Josephine County, to include the Cities of Cave Junction and Grants Pass. The original hydrologic and hydraulic analyses were performed by the U.S. Geological Survey (USGS), and completed in 1979. The countywide updated was performed by WEST Consultants, Inc., and was completed in October 2008.

On June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new study and maps must be adopted by December 3, 2009, to maintain its

participation in the flood insurance program (***See Exhibit 5***). The FIS and FIRM maps currently in effect are dated September 27, 1991. The floodway boundary and floodway maps have been incorporated into the new FIRM maps. The existing FIS and FIRM maps will be maintained for historical reference.

Failure to adopt the study and maps by December 3 means the City would be suspended from the flood insurance program effective on that date, leaving citizens at risk of flood damage that would not be covered by the National Flood Insurance Program.

Adoption of the new FIS and FIRM maps requires that Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) be amended to reference the new FIS and FIRM effective December 3, 2009. The revision is a modification to the narrative of the Comprehensive Plan and the change is reviewed as a minor amendment to the database in accordance with Section 13.5.2 of the Comprehensive Community Development Plan Policies document. No criteria are reviewed with the narrative change.

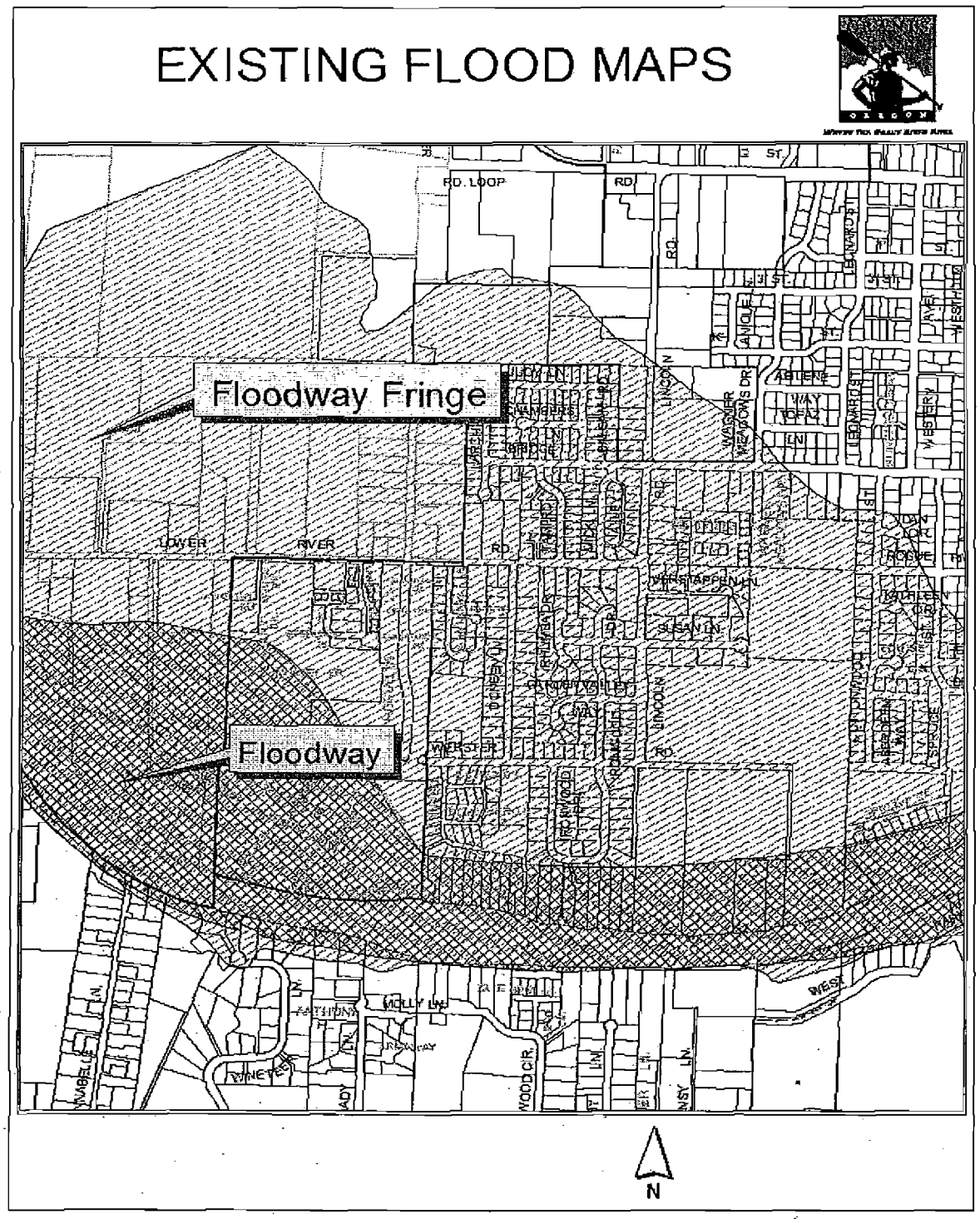
In addition to adopting the new FIS and FIRMs, FEMA's "Letter of Final Determination" states additional requirements must be met under Section 1361 of the National Flood Insurance Act of 1968, as amended, within six (6) months of the date of their letter. Specifically, the standards of Paragraph 60.3(d) of the NFIP regulations must be met. The letter goes on to list the following actions in order to be in compliance:

- Amend existing regulations to incorporate any additional requirements of Paragraph 60.3(d);
- Adopt all standards of Paragraph 60.3(d) into one new, comprehensive set of regulations; or
- Show evidence that regulations have previously been adopted that meet or exceed the minimum requirements.

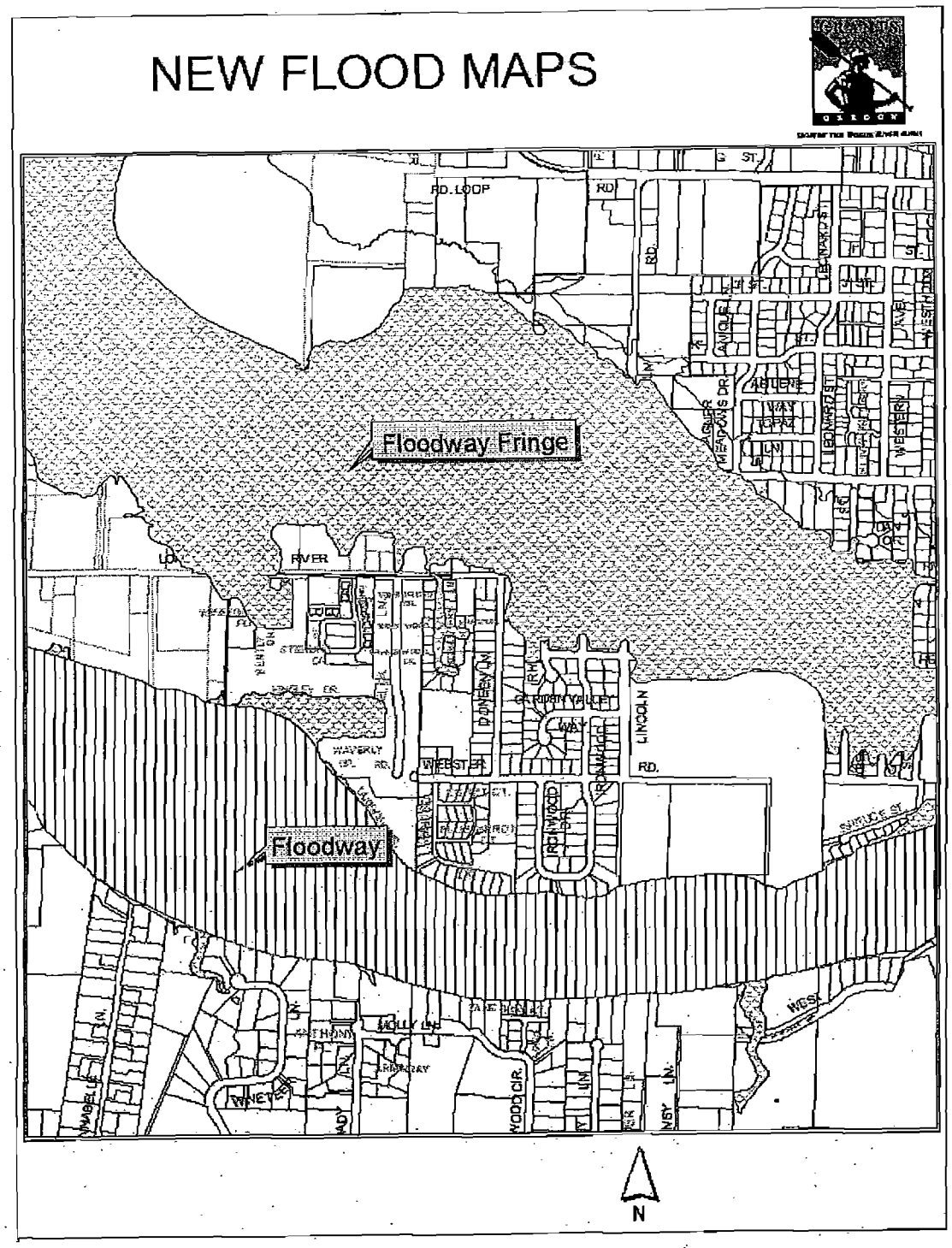
The "Letter of Final Determination" included a "Summary of Map Actions" documenting previous "Letter of Map Change (LOMC) actions (including Letters of Map Amendment and Letters of Map Revision) which will be superseded by the revised FIRM panels. Many property owners will find little change in the flood information for their property, while others will be required to meet the new elevation requirements for all new structures and substantial improvements to existing structures.

An example of the existing and amended maps is provided:

EXISTING FLOOD MAPS



NEW FLOOD MAPS



The summary notes one LOMC for 643/645 SW Balsam Drive, Grants Pass, Oregon, which will be superseded by new detailed flood hazard information based upon revised hydrologic and hydraulic analyses. The property owners were mailed a separate notice concerning the revised FIRMs, but they have not responded as of the date of this report.

The existing regulations in Article 13 of the Development Code have been reviewed against Paragraph 60.3 (d) and the State's Model Flood Plain Ordinance for consistency. The additions and changes to Section 13.200 are reflective of the regulations from the above documents.

The Municipal Code also includes flood hazard regulations. All flood hazard provisions have been incorporated into Section 13.200 of the Development Code. The final ordinance for approval by the City Council will repeal any old ordinances and existing language that has been incorporated into the Development Code.

V. CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.033 OF THE DEVELOPMENT CODE

Criteria for Amendment. The Zoning Map may be amended by the review bodies provided that all the following criteria are met:

(1) The proposed use, if any, is consistent with the proposed Zoning District.

(2) The proposed Zoning District is consistent with the Comprehensive Plan Land Use Map designation.

(3) A demonstration that existing or proposed levels of basic urban services can accommodate the proposed or potential development without adverse impact upon the affected service area or without a change to adopted utility plans.

(4) A demonstration that the proposed amendment is consistent with the functions, capacities and performance standards of transportation facilities identified in the Master Transportation Plan.

(5) The natural features of the site are conducive to the proposed Zoning District.

(6) The proposed zone is consistent with the requirements of all overlay Districts that include the subject property.

(7) The timing of the zone change request is appropriate in terms of the efficient provision or upgrading of basic urban services versus the utilization of other buildable lands in similar zoning districts already provided with basic urban services.

(8) In the case of rezoning from the Urban Reserve District, that the criteria for conversion are met, as provided in Section 4.034.

Staff Response: Not Applicable. Although the proposed amendments do not related to zoning, it was found that review and acknowledgement of the criteria was important. The adoption of the new FIS and FIRM will result in a map change to the flood hazard, one of the special purpose districts regulated by the City of Grants Pass. The amendment affects properties along the Rogue River and Gilbert Creek. However, the above listed criteria are found not applicable to the amendment.

VI. CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.044 OF THE DEVELOPMENT CODE

(1) The Flood Hazard District map is the Flood Boundary – Floodway Map established by the Federal Emergency Management Agency (FEMA) in the scientific and engineering reports entitled "The Flood Insurance Study for the City of Grants Pass" and the "The Flood Insurance Study for the County of Josephine County, State of Oregon". The flood hazard district map may be amended only by FEMA in the procedure provided for Flood Boundaries – Floodway Maps.

(2) Upon receipt of proper authorization from FEMA, the Director shall begin administering the revised Flood Hazard District, as designated by FEMA.

Staff Response: Satisfied. As noted above, on June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new FIS and FIRM maps must be adopted by December 3, 2009, to maintain its participation in the flood insurance program. Upon adoption, the updated FIS, FIRM and Section 13.200 of the Development Code, will be used to regulate properties in the flood hazard area.

VII. CONFORMANCE WITH APPLICABLE CRITERIA ~ SECTION 4.103 OF THE DEVELOPMENT CODE

The text of the Development Code may be recommended for amendment and amended provided that all of the following criteria of Section 4.103 of the Development Code are met.

CRITERION 1: The proposed amendment is consistent with the purpose of the subject section and article.

Staff Response: Satisfied. The proposal amends Section 13.200 "Flood Hazard District". The purpose statement of Section 13.210 states that the intent of the Flood Hazard District is to designate areas that may be hazardous to development due to flooding. The District is to provide standards that specify how development will minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money;
- Minimize need for rescue and relief efforts;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities;
- Help maintain a stable tax base;
- Notify potential buyers of special flood hazard; and
- Ensure those who occupy flood hazard areas accept responsibility for their actions.

The proposed amendment is consistent with the purpose statement of Section 13.210 because it brings the Development Code into compliance with regulations of the National Flood Insurance Program (NFIP, Paragraph 60.3(d)) as required under Section 1361 of the National Flood Insurance Act of 1968, as amended.

Specifically, the proposed text amendment will:

- Consolidate various flood ordinances currently located within the Municipal Code, into one location in the Development Code;
- Provide additional terms and definitions for the flood hazard district; and
- Brings construction standards for crawlspaces and below-grade crawlspaces into compliance.

CRITERION 2: The proposed amendment is consistent with other provisions of this code.

Staff Response: Satisfied. As noted under Section 13.010 of the Development Code, special purpose districts, to include the Flood Hazard District, provide standards intended to mitigate natural hazards, to protect natural features and to mitigate land use conflicts. The standards applicable for the Flood Hazard District are in addition to the standards of the underlying zoning district. Therefore, the proposed amendment is internally consistent with other provisions of the Development Code.

CRITERION 3: The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, and most effectively carries out those goals and policies of all alternatives considered.

Staff Response: Satisfied. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan. Section 5.2 of Element 5 of the Comprehensive Plan Policy document states that the Development Code shall:

- Regulate development within the 100-year floodplain and floodway as required to maintain participation in the National Flood Insurance Program;

- Provide methods to determine and appeal the location of the 100-year floodplain and floodway boundaries when there appears to be discrepancies between official mapped boundaries and actual field conditions.
- Facilitate flood hazard policies.

The proposed changes to Section 13.200 of the Development Code and the narrative of the Comprehensive Plan help implement the policy statements. As noted above, the narrative of Element 5 of the Comprehensive Plan (Section 5.30 ~ Flood Hazard) is being modified to reference the new FIS and FIRM effective December 3, 2009. The alternative of not adopting the new FIS, FIRM and Code sections is not a viable option as it would cause suspension with the City's participation in the NFIP.

CRITERION 4: The proposed amendment is consistent with the functions, capacities, and performance standards of transportation facilities identified in the Master Transportation Plan.

Staff Response: Not Applicable. The proposed amendments do not pertain to the performance standards of the Master Transportation Plan.

VIII. RECOMMENDATION:

A. It is recommended that the Urban Area Planning Commission recommend that City Council **APPROVE** the amendment of the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

B. It is recommended that the Urban Area Planning Commission recommend that City Council **APPROVE** the proposed amendment to Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.

C. It is recommended that the Urban Area Planning Commission recommend that City Council **APPROVE** the amendment to update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009.

IX. PLANNING COMMISSION ACTION:

A. Positive Action: Recommend approval of the request:

1. as submitted.
2. as modified by the Planning Commission (list):

B. Negative Action: Recommend denial of the request for the following reasons (list):

C. Postponement: Continue item

1. indefinitely.
2. to a time certain.

NOTE: The application is not subject to the 120 day requirement per ORS 227.178.

X. INDEX TO EXHIBITS:

1. Flood Insurance Study (FIS) for Josephine County, Oregon and Incorporated areas, dated December 3, 2009 (full report is available in the Planning file).

2. Flood Insurance Rate Maps (FIRM) dated December 3, 2009 (full set of maps is available in the Community Development office).

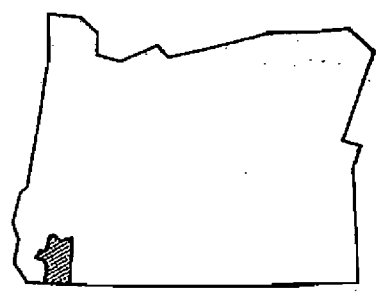
3. Revised Section 13.200 ~ Flood Hazard District Development Code.

4. Revised Element 5, Section 5.30, Flood Hazard located in the Comprehensive Plan

5. FEMA's "Letter of Final Determination" dated June 3, 2009.

FLOOD INSURANCE STUDY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS
VOLUME 1 OF 2



COMMUNITY NAME	COMMUNITY NUMBER
CAVE JUNCTION, CITY OF	410107
GRANTS PASS, CITY OF	410108
JOSEPHINE COUNTY UNINCORPORATED AREAS	415590

PROOF COPY

Effective:
December 3, 2009

Federal Emergency Management Agency
Flood Insurance Study Number
41033CV001A

EXHIBIT 1

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

Selected Flood Insurance Rate Map panels for the community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g. floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

Part or all of this may be revised and republished at any time. In addition, part of this FIS may be revised by a Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS report components.

This FIS report was revised on December 3, 2009. User should refer to Section 10.0, Revision Descriptions, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this FIS report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of this FIS report.

TABLE OF CONTENTS – VOLUME 1

FIGURES

TABLES

TABLE OF CONTENTS – VOLUME 2

EXHIBITS

PUBLISHED SEPARATELY

FLOOD INSURANCE STUDY
JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates information on the existence and severity of flood hazards in the geographic area of Josephine County, including the Cities of Cave Junction and Grants Pass; and the unincorporated areas of Josephine County (referred to collectively herein as Josephine County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the studies in Grants Pass and unincorporated Josephine County were performed by the U.S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA) under Interagency Agreement No. IAA-H-14-78, Project Order No. 8. The analysis for the City of Cave Junction was performed under Amendment 1-2 of the same contract. Analyses for the City of Cave Junction and unincorporated Josephine County were completed in July 1980. The original analysis for the City of Grants Pass was completed in July 1979. The restudy of the reach of the Rogue River flowing through Grants Pass was performed by OTAK, Incorporated. This additional work was completed in December 1989 for FEMA under Contract No. EMW-89-C-2847.

The countywide update was performed by WEST Consultants, Inc. for FEMA under Contract No. EMS-20010-CO-0068. Updated aerial photography dated 2005 was used in the analysis. Work on the countywide update was completed in October 2008.

1.3 Coordination

The dates of the initial, intermediate, and final CCO meetings held for the previous FIS reports for Josephine County and the incorporated communities within its boundaries are shown in Table 1, "Initial, Intermediate, and Final CCO Meetings". They were attended by representatives of FEMA, the U.S. Geological Survey, the communities, and the study contractor.

Table 1. Initial, Intermediate, and Final CCO Meetings

Community	Initial CCO Date	Intermediate CCO Date(s)	Final CCO Date
Cave Junction, City of	January 12, 1978	May 12, 1980	June 3, 1981
Grants Pass, City of	January 1978	May 27, 1980 and May 25, 1988	September 19, 1990
Josephine County, unincorporated areas	January 12, 1978	May 12, 1980	June 3, 1981

Streams requiring detailed study were identified at a meeting held on January 12, 1978. In attendance were representatives of the U.S. Geological Survey, FEMA, Josephine County, and the communities of Cave Junction and Grants Pass. The U.S. Army Corps of Engineers (COE) provided hydrologic data for the original Rogue River study, reflecting anticipated flood-control regulation from Lost Creek Dam, located 55.4 miles upstream from the city.

Results of the hydrologic analyses were coordinated with the COE. Ending water-surface elevations at Savage Rapids Dam on the Rogue River were consistent with data furnished by the U.S. Geological Survey for the Jackson County Flood Insurance Study (Reference 1).

On May 12, 1980, an intermediate meeting reviewing preliminary work done by the study contractor was attended by representatives of the study contractor, FEMA, the City of Cave Junction, and Josephine County.

On May 27, 1980, the results of the original study for the City of Grants Pass were reviewed at the final community coordination meeting attended by representatives of FEMA, the city, and the study contractor. No problems were raised at the meeting.

A final coordination meeting for the City of Cave Junction and Josephine County was held on June 3, 1981. The meeting was attended by representatives of the FEMA, the study contractor, the City of Cave Junction, and Josephine County. All problems raised at the meeting were resolved.

Several flooding sources within Grants Pass, including portions of the Rogue and Applegate Rivers, and portions of Louse and Waters Creeks were selected for restudy at a meeting attended by representatives of FEMA, Josephine County, the City of Grants Pass, and the study contractor on May 25, 1988. Results of the hydrologic analyses performed by OTAK, Incorporated were coordinated with the COE, USGS, Soil Conservation Service, Oregon Department of Land Conservation and Development, and Josephine County. On September 19, 1990, the results of the restudy were reviewed at the final community coordination meeting attended by representatives of FEMA, the city, and the study contractor.

Countywide Update

An initial community coordination meeting for Josephine County was held on March 6, 2006. This meeting was attended by representatives of the Cities of Grants Pass and Cave Junction, Josephine County, FEMA, and WEST Consultants, Inc. The results of the study were reviewed at the final Consultation Coordination Officer [CCO] meeting held on March 5, 2009, and attended by representatives of the Cities of Cave Junction and Grants Pass, Josephine County, The Oregon Department of Land Conservation and Development and FEMA. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the geographic area of Josephine County, Oregon, including the incorporated communities listed in Section 1.1.

The flooding sources studied by detailed methods in unincorporated Josephine County and the City of Cave Junction were selected with priority given to all known flood hazards and areas of projected development or proposed construction through 1985. Projected development or proposed construction were considered through 1995 within the City of Grants Pass.

The limits of detailed studies in Josephine County were determined by FEMA with community and study contractor consultation at meetings in January 1978 and May 1988. Table 2 lists the flooding sources studied in detail and the included segments. River mileages used in this discussion are based on data published by the Hydrology Committee of the Columbia Basin Inter-Agency Committee (Reference 2).

Table 2. Flooding Sources Studied by Detailed Methods

Flooding Source	Limits of Detailed Study
1. Applegate River	From its confluence with the Rogue River to approximately 4,000 feet upstream of Wildcat Gulch near Murphy.
2. Deer Creek	From a point approximately one mile southwest of Selma (RM 3.5) to Crooks Creek.
3. Gilbert Creek	From SW Rogue River Avenue to approximately 875 feet upstream from NW North Hill Drive.
4. Illinois River	From the stream gaging station north of Kerby (near RM 50.0) to the confluence of the East and West Forks of the Illinois River.
5. East Fork Illinois River	From its confluence with the Illinois River to approximately 500 feet downstream from Sucker Creek near Cave Junction and from Little Elder Creek (RM 65.6) to Page Creek south of Takilma.
6. West Fork Illinois River	From its confluence with the Illinois River to the Redwood Highway bridge and from a point 870 feet downstream from Hugo Road at O'Brien (RM 7.8) to a point approximately 2.4 miles further upstream.
7. Jumpoff Joe Creek	From its confluence with the Rogue River to Monument Drive near Merlin.
8. Louse Creek	From its confluence with Jumpoff Joe Creek to Granite Hill Road.
9. Murphy Creek	From its confluence with the Applegate River to approximately 7,000 feet upstream from its mouth.

Table 2. Flooding Sources Studied by Detailed Methods (continued)

10. Rogue River	From Maple Creek near Galice (RM 75.2) to the Josephine-Jackson County limits at Savage Rapids Dam.
11. Rogue River Right Overbank	From its confluence with the main stem of the Rogue River to its divergence from the main stem of the Rogue River approximately 1,300 feet upstream from Lincoln Avenue.
12. Slate Creek	From its confluence with the Applegate River to approximately the intersection of Round Prairie Road and Redwood Highway.
13. Waters Creek	From its confluence with Slate Creek to approximately 6,200 feet upstream from its mouth.

Flows in Skunk Creek and Blue Gulch are well contained in rectified channels or underground conduits and were not included in the original study.

The consultation meetings in January 1978 and May 1988 further identified flooding sources for which the extent of floodway analysis would be limited or excluded. The Rogue River floodway was determined only from Pass Creek downstream of Grants Pass to the Josephine-Jackson County boundary. The Louse Creek floodway analysis was terminated at a point 2,100 feet downstream from the Interstate Highway 5 bridge. The detailed analysis of Murphy Creek did not include a floodway analysis. Floodway delineations were considered unnecessary in the areas already having multiple Federal, State, and county permit requirements for new construction (such as the area downstream from Pass Creek on the Rogue River).

Approximate analyses were used to study flooding sources in areas having a low development potential or minimal flood hazards. The scopes and methods of analysis were proposed to, and agreed upon by FEMA, Josephine County, and the Cities of Cave Junction and Grants Pass. These analyses were adopted from previously effective flood hazard boundary maps (Reference 3). Table 3 lists the flooding sources, grouped by watershed, which were studied by approximate methods.

Table 3. Flooding Sources Studied by Approximate Methods

1. Rogue River, Grave Creek, Wolf Creek, Coyote Creek, Limpy Creek, and Dutcher Creek.
2. Jumpoff Joe Creek, Quartz Creek, Bummer Creek, Bannister Creek, Schoolhouse Creek, and Harris Creek.
3. Slate Creek, Cheney Creek, Murphy Creek, Williams Creek, Banning Creek, and the East and West Forks of Williams Creek.
4. Deer Creek, Clear Creek, Draper Creek, Davis Creek, McMullin Creek, and Crooks Creek.
5. Illinois River, West Fork Illinois River, Mendenhall Creek, Rough and Ready Creek, Elk Creek, East Fork Illinois River, Kelly Creek, Tyger Creek, Sucker Creek, Democrat Gulch, Mulvaney Gulch, Althouse Creek, and Althouse Slough.

2.2 Community Description

Josephine County is located in southwestern Oregon, sharing its southern boundary with the State of California. Established in 1856, the county has an area of 1,625 square miles. Residential land development is present throughout the county due to the moderate climate and recreational features of the region. The estimated population of the county was 52,100 in 1978 (Reference 4). The population as of the 2000 census was 75,726 (Reference 5). The climate of Josephine County is typical of other areas of Oregon west of the Cascade Range. The average July temperature is 71.2°F; in January, the average temperature is 39.9°F. The Klamath Mountain Range to the west provides a minor orographic barrier to winter storms moving inland from the Pacific Ocean. Heavy winter rainfall usually occurs in the interior valleys, and deep snow accumulates at the higher elevations of the Cascade, Siskiyou, and Klamath Mountain Ranges. The average annual rainfall varies from approximately 30 inches in Grants Pass to over 60 inches in the Siskiyou Mountains. The Cascade Range, far to the east, accumulates almost 80 inches of precipitation (Reference 6).

Josephine County is drained almost entirely by the Rogue River and its two principal tributaries, the Applegate and Illinois Rivers. Steep, mountainous terrain lends to rapid runoff when mild temperatures and heavy rainfall melt snow at the higher elevations.

The Rogue River originates in the Cascade Range where the highest elevations exceed 8,000 feet. The drainage area of the river as it enters Josephine County at Savage Rapids Dam is 2,430 square miles. As the river flows westerly through the county, flood flows are fairly well contained by both banks until reaching the City of Grants Pass, 5.5 miles downstream of the dam. From Grants Pass to Finely Bend (9.9 miles west of the city), vast areas of low-lying terrain are subject to severe flooding. From Finley Bend, the river meanders north of Jumpoff Joe Creek (8.5 miles downstream). In these reaches, flood flows are subject to natural bank constrictions which result in sizable ponding of water. Beyond Jumpoff Joe Creek, the Rogue River flows northwesterly toward the resort community of Galice. In this reach, flood flows are totally contained by steep canyon walls, especially at Hellgate Canyon and at an unnamed canyon ending at Taylor Creek. In these canyons, flood flows become constricted to a few hundred feet in width. Beyond Galice, the river continues its westward passage through the Klamath Mountain Range until it eventually reaches the Pacific Ocean.

The Applegate River originates in the Siskiyou Mountains which form all but the northern boundary of the basin. The summit of the range reaches elevations of over 7,000 feet in some areas. The river enters Josephine County from the southeast at a point 7.5 miles upstream from the small community of Murphy. The drainage area at a discontinued gaging station at the bridge in Murphy is 663 square miles. Flood flows in a sharply meandering channel inundate wide portions of the floodplain that lie upstream from natural constrictions. Five miles downstream from Murphy, the river passes through a short, narrow canyon. After leaving the canyon, overbank flooding is moderate until the river becomes affected by backwater from the Redwood Highway (U.S. Highway 199) bridge near Wilderville. Here, extensive flooding occurs. Approximately 0.6 miles downstream from the bridge, the Applegate River becomes affected by backwater from the Rogue River. The inundated Applegate River flood plain width exceeds 4,000 feet at its mouth (6.4 miles west of the City of Grants Pass).

The eastern boundary of the Illinois River basin is also formed by the Siskiyou Mountains. The southern and western boundaries are formed by the Chetco Divide of the Klamath Mountain Range. Summit elevations vary from 4,000 to 6,000 feet. The headwaters of Illinois River consist of two principal tributaries, the East and West Forks Illinois River. The

East Fork Illinois River enters Josephine County from the south at a point 3.9 miles upstream from the community of Takilma. The drainage area at a gaging station located 0.3 miles north of the county limits is 42.3 square miles. General flooding occurs in most areas near Takilma except in a gorge east of the community. Farther north, extensive flooding occurs in the wide, flat floodplain downstream from the Redwood Highway Bridge near Cave Junction. The East Fork Illinois River joins the West Fork Illinois River to form the main stem of the Illinois River at the City of Cave Junction.

The West Fork Illinois River also flows northerly into Josephine County at a point 7.1 miles upstream from the community of O'Brien. The drainage area of a gaging station located approximately 4 miles north of the county limits is 42.4 square miles. The most significant flooding in O'Brien occurs at the Redwood Highway Bridge. Overflow inundates portions of the community before re-entering the channel downstream from the bridge. Farther north, near Cave Junction, flooding is much more severe. Wide areas are inundated, especially near the drive-in theater located 2.5 miles south of the community.

Below the confluence of its East and West Forks, the Illinois River flows northerly through fertile agricultural areas. Wide floodplains between Cave Junction and Kerby (2 miles to the north) become completely flooded. The flooding north of Kerby is equally severe, caused in part by a sharp bend in the river as it enters a narrow canyon. Beyond the mouth of the canyon (2.5 miles north of Kerby), the Illinois River continues westward through the Klamath Mountain Range until it meets the Rogue River at the summer resort community of Agness in Curry County, 50.2 miles downstream.

Deer Creek, a tributary of the Illinois River, is located entirely within Josephine County. The creek originates in the Siskiyou Mountain foothills, south of Grants Pass, and flows westerly toward the community of Selma. The drainage area of the stream at a point 3.5 miles upstream from its mouth is 101 square miles. Flood plains in the Selma area are low and flat. Extensive flooding occurs in this agricultural area.

City of Cave Junction

The City of Cave Junction is in the southwestern portion of Josephine County. The city, surrounded by unincorporated areas of Josephine County, is approximately 25 miles southwest of Grants Pass, Oregon, and 12 miles north of the Oregon-California State boundary.

Cave Junction, incorporated in 1948, is the second largest city in the county, with an estimated 1978 population of over 800. Its population as of the 2000 census was 1,363 (Reference 5). Residential development is present throughout the area due to the moderate climate and recreational features of the region.

The climate of Cave Junction is typical of other areas of Oregon west of the Cascade Range. The average July temperature is 71.2°F; in January, 39.3°F. The Klamath Range to the west provides a minor orographic barrier to winter storms moving inland from the Pacific Ocean. Heavy winter rainfall usually occurs in the interior valleys, and deep snow accumulates at higher elevations of the Cascade, Siskiyou, and Klamath Mountain Ranges. (Reference 6).

City of Grants Pass

The City of Grants Pass is situated along the Rogue River in eastern Josephine County approximately 25 miles northwest of Medford, Oregon, and 30 miles north of the Oregon-California State boundary.

Incorporated in 1887, Grants Pass is the county seat and had a population of 23,023 as of the 2000 census. The city extends across a 3-mile-wide valley and is bounded by densely wooded hills to the north and south. Fertile lowland areas support a sizable agricultural industry; timber and related byproducts are also important to the economy. Seasonal recreation fishing and character excursion trips on the Rogue River make Grants Pass a very popular tourist center.

The Rogue River floodplain within the city has areas of dense residential and commercial development. Aerial photographs show that some small tracts of land are undeveloped, but local land use measures may dictate the type and extent of future development. Gilbert Creek has a very high density of residential development.

The drainage area of the Rogue River at the gage in Grants Pass is 2,459 square miles. The river originates in the Caseade Range, where heavily forested slopes reach elevations exceeding 8,000 feet. These steep slopes usually accumulate heavy winter snowfall, and storm runoff is rapid when mild temperatures and sustained rainfall occur during the passage of a Pacific storm front. An exception to this general runoff characteristic occurs above an elevation of 5,000 feet in the vicinity of Crater Lake. Highly permeable pumice soils and lava formations allow much of the rainfall and snowmelt to infiltrate the ground, thus reducing surface runoff (Reference 7).

The drainage area of Gilbert Creek is 5.68 square miles at its mouth. The creek originates in the foothills north of the city, where the highest elevation is approximately 3,100 feet. The channel gradient is very steep until reaching the city, and peak flows usually occur within hours after the passage of a storm front.

Topography varies from the steep, forested slopes of Blue Gulch in the northwestern part of the city to the more gently sloping floodplain of the rest of Grants Pass. Elevations range from approximately 900 feet along the Rogue River to over 1,500 feet in the northwestern portion of the city (Reference 8).

The average annual temperature is 54°F, with historic extremes ranging from 114°F in 1928 to -1°F in 1972 (Reference 9). Average annual rainfall varies from approximately 30 inches in the vicinity of Grants Pass to almost 80 inches in the extreme northeastern corner of the basin near Crater Lake (Reference 6).

2.3 Principal Flood Problems

Abnormally heavy or prolonged rainfall, sometimes combined with snowmelt and frozen or nearly saturated ground, may cause flooding in Josephine County.

All streams in Josephine County usually respond to the same storm event, but the quantitative response can vary considerably. For example, most steams reached record stages during the devastating floods of December 1964; peak stages on the Applegate River, although high in 1964, were exceeded in January 1974.

A comparison of historical floods at gaging stations must consider the possibility of changes that might occur in the stream channels between storm events. The scouring of a stream channel could result in the greater flood having a lower recorded elevation.

Flood flows tend to attenuate as they move downstream due to the lessening of the channel gradient and to the storage of water in the flood plains. Gaging-station records collected in the upper part of a basin are, therefore, seldom representative of the runoff characteristics in the lower basin.
The largest flood in recent times occurred on the Rogue River on December 23, 1964. A peak flow of 152,000 cubic feet per second (cfs) inundated large residential areas in and around the City of Grants Pass. A storm hydrograph at the Grants Pass gaging station showed the maximum stage was reached within 2 days after the initial raise in stage, and overbank flows remained for almost 4 days after the peak occurred. Antecedent climatological conditions were: 90 inches of snow had accumulated at Crater Lake by December 21, the freezing level rose to 11,000 feet on December 22, and rainfall totaled 8 to 10 inches at several reporting stations on December 21 and 22. The Crater Lake snow depth decreased to 68 inches by December 23 with a loss of 4 to 5 inches in water content (Reference 10). Downstream from the city to approximately Finley Bend, thousands of acres of productive farmland were under as much as 10 feet of water. Severe erosion and siltation occurred, and extensive irrigation systems were destroyed. It is estimated that 360 residences, 19 commercial establishments, and 2 industries were damaged in this area (Reference 10).

Downstream from Finley Bend, the river meanders in and out of deep canyons where development consists of ranches, summer homes, and recreational facilities. In December 1964, it is estimated 70 residences were flooded, and 18 were completely destroyed (Reference 10).

Based on 38 years of records collected at a gaging station in Grants Pass, it is estimated that a flood of that magnitude would have occurred on the average of once every 50 years prior to the construction of Lost Creek Dam. It would now occur on the average of once every 120 years with anticipated flood regulation in effect (Reference 11).

In the past 120 years, the December 1964 flood is believed to have been exceeded twice in Grants Pass. The U.S. Army Corps of Engineers estimates a flood in December 1861 had a discharge of 175,000 cfs; in February 1890, 160,000 cfs (Reference 10). They estimated that, due to upstream storage, discharges of that magnitude would now occur on the average of once every 180 years and 140 years, respectively (Reference 11).

Gilbert Creek in Grants Pass is ungaged and quantitative historical high-flow data are unknown. Residents living adjacent to the channel have observed road overflow at various culverts throughout the city. There is severe channel encroachment in many areas due, in part, to vertical retaining walls built at the edge of the low-water channel. A house on L Street spans the channel and will obstruct high flows.

On the Applegate River, the largest peak recorded at a gaging station located 1.8 miles southeast of the Town of Applegate in Jackson County occurred on January 15, 1974. A peak discharge of 37,200 cfs exceeded the December 22, 1964 peak of 2,500 cfs. Extremely unstable channel conditions make an exact comparison of instantaneous peak flows impossible, and revisions of previously published data have been necessary.

Flood damage to agricultural lands was extensive, but most of the damage occurred in areas

upstream from the Town of Murphy. It is estimated that 2900 acres of productive farmland were inundated (Reference 12). Most of the residential damage occurred downstream from Murphy when the river scoured a sharp bend and inundated almost 200 acres.

Based on 38 years of data collected at the Applegate gaging station, it is estimated that a flood of the magnitude of the 1974 peak would reoccur on the average of once every 20 years. Now that the Applegate Reservoir is completed, the recurrence interval has been lengthened.

The largest flood on Slate Creek occurred on December 22, 1964. A peak flow of 4,650 cfs was recorded at a gaging station located 3.6 miles upstream from the community of Wilderville. Flood damage was not extensive because of the sparse population at that time.

Based on 19 years of data collected at the gage, a flood of this magnitude would reoccur on the average of once every 8 years.

The largest flood recorded in the Illinois River basin occurred on December 22, 1964. Two gaging stations located in the upper basin near Takilma and O'Brien indicated unit runoff values of approximately 380 cfs per square mile. Instantaneous peak flows were 15,700 cfs near Takilma and 16,100 cfs near O'Brien. A gaging station located in the lower part of the basin near Kerby had a peak flow of 92,200 cfs and a unit runoff of approximately 240 cfs per square mile. The above unit runoff values are the highest ever recorded in Josephine County.

Because of the sparse population at the time, flood damage primarily involved highway bridges and agricultural land. Water depths of over 15 feet covered the Redwood Highway north of Kerby. Some homes were observed floating away from their foundations during the flood.

Based on 15 years of records collected at the gaging station on Illinois River near Kerby, it is estimated a flood of this magnitude would occur on the average of once every 150 years. In the upper basin where the flood runoff was more intense, the recurrence interval is estimated to be 500 years at Takilma and 300 years at O'Brien. The Takilma gaging station has 39 years of record; O'Brien, 22 years.

Extensive flood damage also occurred in the small tributary basins of Josephine County. Deer Creek, Jumpoff Joe Creek, and Louse Creek, although ungaged, had the highest flows ever observed during the December 1964 storm. Many drainage structures were damaged, resulting in the disruption of traffic. Farmland on the narrow terraces of the valleys suffered erosion and silt accumulations. Without streamflow data, it is not possible to derive statistical flow data for this flood.

2.4 Flood Protection Measures

There are two functioning flood-control reservoirs in the basin. Lost Creek Dam, located 55.4 miles upstream from the gage in Grants Pass, will reduce the magnitude of peak-flow events. It is estimated that a flood of the magnitude of the 1964 Rouge River flood would have occurred approximately once every 50 years prior to the construction of Lost Creek Dam. It should now occur on the average of approximately once every 120 years with existing flood regulation in effect. Due to upstream storage, discharges of the magnitude of the 1861 and 1890 Rogue River floods would now occur approximately once every 180 years and 140 years, respectively (Reference 13). Applegate Reservoir on Applegate River

is also located in Jackson County, 33.6 miles upstream from the community of Murphy.

Construction of Elk Creek Dam began in 1986 and ceased in 1988. The completed portion of the dam was subsequently breached beginning in July 2008. No flood control is provided by the remaining structure.

There are no extensive levee systems in the county. Some private interests have constructed dikes adjacent to their property; their capability of withstanding sizable flood events is unknown.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

Federal Emergency Management Agency standards require Flood Insurance Studies in adjacent areas to use consistent hydrologic analyses. Accordingly, the hydrology of the Rogue River in Josephine County is identical to that used in the Jackson County Flood Insurance Study (Reference 1). The U.S. Army Corps of Engineers has since revised that hydrology (Reference 11) as shown in the following table (discharges are in cfs).

	Discharges	
Flood Event	Josephine County	Revised Hydrology
10-percent-annual-chance	73,000	70,000
2-percent-annual-chance	128,000	120,000
1-percent-annual-chance	144,000	153,000
0.2-percent-annual-chance	260,000	280,000

Both sets of data are based on 38 years of stream flow records collected at Grants Pass gaging station (1939-1976). The discharges are adjusted for expected probability and include anticipated flood-control regulation from Lost Creek Dam. The revised values are still within the 90 percent confidence limits of the original values. The regulating effect of the proposed Elk Creek Dam currently in development by the COE has been evaluated.

Table 4. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
Applegate River					
At Confluence with Rogue River	768	26,600	54,700	78,200	136,000
Above Slate Creek	714	24,200	50,300	72,600	128,000
At Wilderville Gaging Station (No. 14369500)	698	23,500	49,000	71,000	125,000
At Wildcat Gulch Near Murphy	654	21,600	45,400	66,500	118,000
Upstream of Wildcat Gulch	652	20,400	43,200	62,000	112,000
At River Mile 17	644	19,800	42,300	60,400	109,800
Deer Creek					
At River Mile 3.5 Near Selma	101.0	10,800	16,800	19,000	25,800
Below McMillan Creek	74.0	8,250	12,700	14,400	19,400
Below Crooks Creek	47.7	5,610	8,580	9,690	13,600
Gilbert Creek					
At Confluence with Rogue River	5.7	531	836	973	1,330
At West B Street	5.3	484	760	885	1,210
At Hillcrest Drive Sewer Outlet	4.4	398	625	728	995
Illinois River					
At Gaging Station No. 14377100 (Near Kerby)	380.0	54,900	77,300	86,800	10,900
At Former Gaging Station No 14377000 (at Kerby)	364.0	4,700	66,500	74,600	93,300
Below Confluence of East and West Forks of the Illinois River	346.0	44,900	63,500	71,200	89,000

Table 4. Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
East Fork Illinois River					
At Confluence with Illinois River	234.0	28,100	43,800	49,200	66,400
Below Sucker Creek	215.0	26,100	40,500	45,500	61,300
Below Little Elder Creek	67.6	9,670	14,600	16,400	21,800
Below Page Creek	50.1	9,060	12,800	14,500	18,200
West Fork Illinois River					
At Confluence with Illinois River	112.0	20,600	31,400	35,100	46,600
At U.S. Highway 199	105.0	19,400	29,500	33,000	43,300
At Rockydale Road	54.6	10,900	16,400	18,400	24,300
At River Mile 10.3 Near O'Brien	47.5	10,600	14,400	15,700	18,900
Jumpoff Joe Creek					
At Confluence with Rogue River	110.0	9,330	14,600	16,500	22,500
Below Quartz Creek	97.1	8,460	13,200	15,000	20,300
Below Louse Creek	75.2	6,790	10,500	11,900	16,200
At Monument Drive (U.S. Highway 99)	37.1	3,770	5,770	6,540	8,800
Louse Creek					
At Confluence with Jumpoff Joe Creek	30.9	2,840	4,130	4,890	6,560
At Interstate Highway 5	18.7	2,606	3,120	3,530	4,730
Upstream of Soldier Creek	16.5	1,850	2,780	3,160	4,220
At Granite Hill Road	13.5	1,550	2,320	2,630	3,520

Table 4. Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
Murphy Creek					
At Confluence with Applegate River	15.2	1,850	2,780	3,140	4,190
At River Mile 1.5 Near Murphy	13.9	1,710	2,560	2,900	3,860
Rogue River					
At Maple Creek Near Galice	3,500	119,000	212,000	254,000	442,000
Below Jumpoff Joe Creek	3,430	117,000	207,000	249,000	434,000
Below Applegate River	3,270	111,000	196,000	236,000	415,000
At Grants Pass Gaging Station (No. 14361500)	2,460	73,000	128,000	144,000	260,000
At Josephine County Limits	2,430	72,000	126,000	142,000	256,000
Slate Creek					
At Confluence with Applegate River	44.6	5,190	7,900	8,920	12,000
At Round Prairie Creek	39.8	4,690	7,130	8,050	10,800
At Confluence with Waters Creek	28.7	3,470	5,260	5,950	7,950
Waters Creek					
At Redwood Highway (199)	7.1	1,010	1,500	1,690	2,230
Upstream of Salt Creek	5.4	800	1,170	1,320	1,740
At Waters Creek Road	4.9	730	1,070	1,210	1,590

Construction of Elk Creek Dam ceased in 1988. The completed portion of the dam was subsequently breached beginning in July 2008. No flood control is provided by the remaining structure. However, since the regulated discharges, including the anticipated benefit of the Elk Creek facility, were found by OTAK, Inc. to fall within the 90 percent confidence interval of the unregulated discharges (i.e., without the Lost Creek and Elk Creek facilities), no changes were made to the discharges shown in the Summary of Discharges (Table 4).

The U.S. Army Corps of Engineers also provided concordant flood control from both Lost Creek and Applegate Reservoirs. The Applegate River data were based on records collected over an 18-year period at a discontinued gaging station near Wilderville.

The magnitude of the design floods on Slate Creek, and Illinois, East Fork Illinois, and West Fork Illinois Rivers was derived by using a log-Pearson Type III probability distribution (Reference 14) of the gaging station data referred to in Section 2.3. A generalized skew coefficient was determined from U.S. Water Resources Council Bulletin 17 (Reference 15). Discharges at sites within 5 to 25 percent of the gaging station drainage area were estimated using the following transfer formula:

$$Q_u = Q_g (A_u/A_g)^n$$

Where "Q_g" and "A_g" are the discharge and drainage area at the gage, "Q_u" and "A_u" are the discharge and drainage area at the ungaged location, and the exponent "n" is an exponent derived from regional flood-frequency equations published in the U.S. Geological Survey Flood-Frequency Analysis for Western Oregon (Reference 16).

Design floods at all other ungaged sites were determined using the flood-frequency equations included in the western Oregon analysis. The 0.2-percent-annual-chance flood equation for the Rogue River basin, not included in that report, is:

$$Q_{0.002}(500) = 105A^{0.91}(ST+1)^{-1.36}I^{1.04}$$

Where "A" is drainage area in square miles, "ST" is the area of lakes and ponds (in percent), and "I" is the rainfall intensity (2-year, 24-hour) in inches.

The Gilbert Creek hydrology is based on 25 years of peak-flow data collected at a gaging station on Jones Creek, a small basin east of the the City of Grants Pass with headwaters adjoining Gilbert Creek. Jones Creek has a drainage area of 7.41 square miles at a gaging station located at the culvert entrance on Interstate Highway 5. The discharges used in this study were computed using a direct drainage area ratio of the two basins even though runoff in the urban areas of Gilbert Creek may differ from the rural runoff in the Jones Creek basin. If was beyond the scope of this study to conduct a detailed study of the effects of the storm-sewer inflows within the city.

In order to determine the magnitude of the design floods on Jones Creek, the 25 years of peak data were used in a log-Pearson Type III probability distribution, with a generalized skew coefficient determined from the U.S. Water Resources Council Bulletin 17 (Reference 15). The USGS computer program J-407 (Reference 14) detected no low outliers, and the discharges were not adjusted for expected probability.

The Gilbert Creek drainage area was determined on the basis of drainage maps provided by the City of Grants Pass (Reference 17) and by a USGS topographic map (Reference 8).

The 1989 OTAK, Inc. analysis computed flows for Louse Creek and Waters Creek using the USGS equations in the publication entitled "Magnitude and Frequency of Floods of Western Oregon" (Reference 16). The 0.2-percent-annual-chance Q equation, describe above, was also used. Salt Creek enters Waters Creek approximately one-half mile upstream of Waters Creek mouth. The hydrologic analyses for the upper portion of the Applegate River were conducted using records from the 42-year period of unregulated flow (i.e., 1939-1980) at the USGS gaging station near Applegate (No. 14366000) and the regulated flow curves provided by the COE. The accepted regulated discharges (i.e., regulation due to the Applegate Dam) were projected to additional locations of interest upstream of Wildcat Gulch near Murphy using the flow transfer formula described above. Peak discharge information was provided for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods on the Applegate River, although only the 1-percent-annual chance flood profile was computed.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Water-surface elevations were estimated at all cross sections by a computer program that computes energy losses between sections, using conservation-of-energy equations (step-backwater analysis). This hydraulic model requires accurate measurements of channel cross sections, bridge and dam geometries, and a proper evaluation of the roughness of the main channel and floodplains. The water-surface elevations at each cross section were determined by using the U.S. Geological Survey computer program E-431 (Reference 18).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM.

Channel and cross section properties were determined by photogrammetry based on aerial photographs taken September 30, 1978 (Reference 19). Bridge geometries and the underwater portion of the cross sections were surveyed in January 1979. Roughness coefficients (Manning's "n") were based on field observation and aerial photographs. The range of roughness values used for all floods is shown in Table 5.

Table 5. Range of Manning's Roughness Values

Flood Source	Main Channel	Flood Plain
Applegate River	0.032-0.042	0.032-0.080
Deer Creek	0.034-0.045	0.035-0.080
Gilbert Creek	0.032-0.055	0.035-0.085

Table 5. Range of Manning's Roughness Values (continued)

Illinois River	0.038-0.065	0.034-0.080
canyons near Kerby	0.045-0.050	0.034-0.080
Sours Flat area	0.038-0.042	0.034-0.080
near Pomeroy Dam	0.050-0.065	0.034-0.080
gravel & rock areas	0.040-0.045	0.034-0.080
East Fork Illinois River	0.035-0.055	0.035-0.080
West Fork Illinois River	0.045-0.060	0.050-0.080
overflow reach near Lone Mountain Road	0.035-0.070	0.040-0.080
Jumpoff Joe Creek	0.032-0.055	0.032-0.100
Louse Creek	0.033-0.048	0.035-0.080
Murphy Creek	0.045-0.050	0.045-0.080
Rogue River	0.030-0.065	0.032-0.090
through Grants Pass	0.031-0.038	0.031-0.200
Slate Creek	0.032-0.055	0.038-0.150
Waters Creek	0.030-0.070	0.038-0.110

The initial water-surface elevations for the flood profiles on the Rogue River were derived from a step-backwater convergence study made through a five-section reach ending at cross section A (Reference 20). Profile convergence was attained for each of the prescribed flows by using the U.S. Geological Survey computer program E-431.

The computation procedure requires a uniform change in channel conveyance between cross sections. Also, in rapidly expanding reaches, the program assumes 50 percent of the energy is recovered between sections (due to uncertain eddy losses). Program E-431 became invalid at the outlet of two narrow canyons where chute flows and hydraulic jumps occurred (cross sections R and AB). Therefore, water-surface profiles through these canyons were estimated, and the hydraulic model was reset at the canyon entrances using elevations derived by slope-conveyance studies.

Both Hellgate and Robertson bridges are built well above the 0.2-percent-annual-chance flood levels, and neither would constrict the flows.

The main channel varied from long calm reaches of silt, interlaced with boulders, to the bedrock outcrops of Hellgate Canyon. Flood plain vegetation varied from smooth, after-harvest hop fields to dense, forests.

The Rogue River floodway analysis began at cross section BU. The initial 1-percent-annual-chance flood elevation for the floodway was taken directly from the normal profile computed for the cross section. Because encroachment was not allowed downstream from cross section BU, no surcharge was computed for that cross section.

The hydraulic analyses of the reach of the Rogue River in Grants Pass began at a point approximately 2.3 miles downstream of the city, where the overbank flow breakout returns to the channel. Photographs of the 1964 flood revealed that there was divided flow downstream of the city. The December 1964 flood discharges in Grants Pass (152,000 cfs) closely approximated the published 1-percent-annual-chance discharge of 144,000 cfs. This

discharge resulted in well-defined overflows at the sewage treatment plant and at the Roguelia Mobile Home Park.

The initial hydraulic analyses were conducted to identify the various flow behaviors. Three distinct flow patterns occurred:

1. The 10-percent-annual-chance flow was contained in the channel.
2. The 2- and 1-percent-annual-chance floods caused overflows on the right bank.
3. The 0.2-percent-annual-chance flood completely inundated the floodplain.

An iterative hydraulic analysis for divided flows around the islands was undertaken to determine the flow distribution. In order to assess the significance of the overflows, survey data were collected to describe the control section over which these overflows would occur. These data were subsequently incorporated into the hydraulic model using the HEC-2 divided flow option. The hydraulic analyses required flow and water-surface elevation balances between the main stem and the north overbank at three different locations.

The results of the analysis were then compared with the 1964 flood photographs. It was identified that overbank flow returned to the channel at a point located approximately 2.3 miles downstream of the sewage treatment plant.

Surveys of typical cross sections for both the channel and the north overbanks were conducted and then compared to data used in the existing Flood Insurance Study hydraulic model of July 1980. It was determined that the variations between the old cross sections and the recently surveyed cross sections were less then one foot. Therefore the existing cross sectional data were retained for profile computations. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21).

The 1-percent-annual-chance profile on the Rogue River agreed favorably with many 1964 high-water marks found throughout the study area. However, an exact comparison of profiles is impossible in the lower reaches because of ungaged tributary inflow during the 1964 flood.

There was a small disagreement on the Rogue River between the computed profile elevations and elevations determined from a stage-discharge relation at a gaging station in Grants Pass. A minor adjustment was, therefore, prorated from the gage to the Seventh Street bridge, 0.6 mile downstream.

The 1989 restudy of the Rogue River analyzed the reach from a point approximately 3.5 miles downstream of the South 6th Street Bridge in Grants Pass to a point 2.2 miles upstream of the South 6th Street Bridge. The restudy included the proposed Redwood Highway crossing. The hydraulic study was conducted by the Oregon Department of Transportation's Hydraulic Division and was provided by FEMA to OTAK, Inc.

The restudy used discharge values based on the original values used in the Josephine County Flood Insurance Study of December 1, 1981, which included the regulating effect of the proposed Elk Creek Dam, soon to be completed by the COE. The regulated discharges include most of the anticipated benefit for the Elk Creek facility and were found to fall within the 90 percent confidence interval of the unregulated discharges (i.e., without the Lost Creek and Elk Creek facilities). The original cross sectional geometry and roughness

coefficients for the Rogue River restudy were retained from the original modeling for the restudy computations. Known elevations from the effective modeling were used for the starting water surface elevations of the restudy reach. The selected recurrence intervals were computed using of the COE HEC-2 step-backwater computer program (Reference 21). Photographs of the 1964 flood of the Rogue River at the City of Grants Pass revealed divided flows around the islands located just downstream of the city. To determine the flow distribution, the split-flow option of HEC-2 was used. It was identified that the right overbank flow returned to the channel approximately 2.3 miles downstream of the municipal sewage treatment plant.

The resulting water surface elevations matched within 0.2 feet of those published previously. The floodway analysis for the Rogue River restudy was computed using the full 1-percent-annual-flood discharge assuming no breakout flows.

Flood profiles for Gilbert Creek began at the culvert on Rogue River Avenue, the first point where energy controls would not be influenced by backwater from the Rogue River. The initial water-surface elevations were determined from composite stage-discharge relation computed at the culvert entrance.

A composite stage-discharge relation is a graphic presentation that combines the amount of water flowing through the culvert with the amount flowing over the road, then relates the total flows to an upstream water-surface elevation. Flows through 23 Gilbert Creek culverts were computed using USGS computer programs E-431 and A-526 (Reference 18 and 22). Most road overflow situations involved flat street surfaces where flow direction was difficult to determine. Where unconfined overflow occurred, the effective width was based on either the upstream channel geometry or the location of houses and garages in the approach section. In all cases, the amount of road overflow was computed using coefficients published in the USGS Techniques of Water-Resources Investigations (Reference 23).

Storm-sewer inflows were estimated at West B Street and at Hillcrest Drive using outlet pipe diameters and by assuming the pipe gradient was equal to the ground slope to the nearest manhole structure. Resultant discharges were derived from the Manning equation for pipe flow as given in King's Handbook of Hydraulics (Reference 24).

Both Gilbert Creek and Jones Creek have a trans-basin irrigation canal in the upper basin. The Tokay Canal diversion from the Rogue River is at a pumping station at Savage Rapids Dam, located 6.1 miles. upstream from the Grants Pass gaging station. The canal contribution to flood flows is uncertain because some flows can enter the basin as spillage from the canal. The ditch capacity at the pumping plant is 47 cfs, but the capacity upstream from Hawthorne Avenue is only 27 cfs. This study assumes ditch flows are negligible during peak events.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Initial water-surface elevations for the profiles on Jumpoff Joe Creek reflected concordant flows of the Rogue River. The 1-percent-annual-chance flood elevations on Rogue River extended 2.2 miles up the Jumpoff Joe Creek channel. The initial water-surface elevation used for the floodway analysis was estimated from a slope-conveyance study that did not consider concordant flow or backwater. The Jumpoff Joe Creek profiles continued uninterrupted past the confluence of Louse Creek in Merlin. An increase in channel gradient

upstream from Merlin made it necessary to establish additional cross sections. These cross sections were estimated by interpolating between the geometries of the two nearest cross sections, and by using a map having 4-foot contour intervals (Reference 19).

Supercritical flow situations were encountered at three cross sections. Each situation required a resetting of the model using critical-depth elevations for each of the prescribed flows.

At Russell Road, the 0.2-percent-annual-chance flood overflowed the highway at a point 800 feet south of the bridge. A composite flow situation could not be computed because the flow in the main channel and flow in the overflow section did not share a common headwater elevation. Road overflow was estimated.

The main channel consisted of gravel and small boulders and the overbank areas varied from pastures to dense forests.

The initial water-surface elevations for profiles on Louse Creek were headwater elevations computed for the railroad bridge in Merlin. The headwater elevations were manually computed from a critical-depth section at the outlet of the bridge. Exact discharge values could not be determined because of unknown inflow from Harris Creek, a large tributary with a bridge 450 feet north of the Louse Creek channel. There is an exchange of flow between the two channels via a large ditch at the toe of the railroad embankment. An apportionment of flow through each structure could not be made because there is no common headwater elevation due to the lateral slope of the terrain. For the purpose of this study, it was assumed no peak flow exchange occurs during flooding.

The 1-percent-annual-chance flood on Louse Creek was found to be contained within the main channel except at the railroad bridge in Merlin and at a bridge on Monument Drive. A portion of the Louse Creek floodplain, downstream of Monument Drive, was found to be susceptible to 1-percent-annual-chance sheet flow, a condition of overland flow where elevations and directions of flow are difficult to determine. Small embayments at the mouths of tributaries also would experience flooding. A floodway was designed to occupy the entire width of the 1-percent-annual-chance floodplain because any encroachment on the main channel would increase the stream velocities and aggravate bank erosion. Supercritical flow occurred at 18 cross sections in this reach.

Because of the steep channel gradient, 21 additional cross sections were needed to define a continuous profile. The additional cross sections were estimated as described in the Jumpoff Joe Creek discussion.

Approximately 30 percent of the 1-percent-annual-chance flood flow on Louse Creek bypasses the bridge at Monument Drive at a point 600 feet north of the channel. The flow capacity of the bridge would not allow any encroachment on the flood plain, and a floodway analysis was not attempted.

The channel consisted of gravel and cobbles, with some overhanging brush, and overbank values ranged from pasture grass to dense forest.

The 1989 study by OTAK, Inc. extended the portion of detailed study for Louse Creek by adding a reach extending from approximately 470 feet downstream of Monument Drive upstream to its crossing of Granite Hill Road, a distance of 2.9 miles. The starting water

surface elevation for the extended reach was based on known elevations from the effective modeling. Channel and cross section properties were surveyed between February and June of 1989. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21). The average fall of Louse Creek throughout the study reach was approximately 90 feet per mile. This steep slope resulted in many supercritical flow conditions even though surveyed cross sections were taken at an average interval of 600 feet along the creek. Because of the steep channel gradient; 24 additional cross sections were added to the hydraulic model. Overall, the 1-percent-annual-chance floodplain width on the upper Louse Creek varied from 50 feet to 1,000 feet.

Because of the steep channel gradient for Louse Creek, the equal conveyance encroachment option that operates on the energy gradeline was used for the floodway analysis. This method is suggested for steep waterways since it will not allow unreasonable encroachments. The resulting floodway widths varied from 30 feet to 230 feet.

The flood profiles for Applegate River began at its confluence with the Rogue River. Initial water-surface elevations were based on concordant flows where backwater extended 1,180 feet up the Applegate River channel. The initial water-surface elevation for the floodway analysis was determined from a stage-discharge relation established at cross section BZ on Rogue River and does not consider concordant flow or backwater.
A natural constriction at cross section Z caused a supercritical flow situation for the 0.2-percent-annual-chance flood. The change in the state of flow eaused an unrealistic shape in the stage-discharge relation, and the 0.2-percent-annual-chance elevation was, therefore, estimated by extrapolating the rating curve.

Supercritical flows were also encountered at a low diversion dam at the mouth of Murphy Creek. The hydraulic model was reset using elevations derived by critical-depth computations. A direct weir formula could not be used because of excessive bypass flow around the ends of the dam.

The bed material of Applegate River varies from areas of unstable gravel and rock deposits to bedrock outcrops overlain by boulders and gravel. Much of the reach is subject to change due to scour and filling of bed material and to gravel mining. Floodplain vegetation varied from pasture grass to dense deciduous brush. On the south bank at cross section AE, an upstream bank projection would cause a portion of the cross section to become ineffective for transmitting flows due to a large eddy current. An unrealistically high "n" value was therefore assigned to reduce the conveyance in that portion of the cross section.

The 1989 OTAK, Inc. analysis extended the Applegate River study from the previous upstream limit of detailed study to the Josephine-Jackson County line, an addition of approximately 5.6 miles. Known water surface elevations from the effective modeling were used as the downstream boundary for the extended modeling. Cross section properties were surveyed between February and June of 1989. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21). No floodway was computed as a part of the 1989 analysis due to the lack of development pressure.

The average fall of the Applegate River throughout the 1989 study area was approximately 17 feet per mile. With surveyed cross sections taken at an average interval of one every 3,000 feet, many critical depth statements were encountered during the initial hydraulic

simulations. This problem was solved by using the interpolated cross sections option of the HEC-2 model. Approximately 21 cross sections were automatically inserted by the hydraulic model throughout this reach of the Applegate. Overall, the 1-percent-annual-chance floodplain width on the limited detail study portion of the Applegate varied from 1,200 feet to 2,700 feet.

Initial water-surface elevations for profiles on Slate Creek reflect concordant flows of Applegate River. Backwater extended 5,500 feet up the Slate Creek channel. The initial elevation for the Slate Creek floodway analysis was determined by a slope-conveyance study through the first five cross sections of the reach (to cross section C). Concordant flow with backwater was not a consideration for the floodway analysis. Main channel bed material consisted of areas of rock and gravel deposits interlaced with boulders. The upper reach consisted of bedrock outcrops and boulders. Floodplain vegetation varied from moderate to extremely dense brush and tree growth.

Waters Creek, a small tributary to Slate Creek, was studied by OTAK, Inc. in 1989 from its confluence with Slate Creek upstream for a length of approximately 1 mile. The starting water-surface elevation was computed using the slope-area method. The backwater elevations from Slate Creek at the confluence were computed based on a normal depth approximation for Slate Creek using a discharge computed from the flow/area transfer formula (Reference 16). The Waters Creek confluence is located approximately 3 miles upstream of the confluence of Hound Prairie Creek. Channel and cross section properties were surveyed between February and June of 1989. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 21). The average fall of Waters Creek throughout the study reach was approximately 50 feet per mile. This steep slope resulted in many supercritical flow conditions, even though surveyed cross sections were taken at an average interval of 300 feet along the creek. Because of the steep channel gradient, 17 additional cross sections were added to the hydraulic model. Overall, the 1-percent-annual-chance floodplain varied from 80 feet to 420 feet.

Because of the steep channel gradient for Waters Creek, the equal conveyance encroachment option that operates on the energy gradeline was used for the floodway analysis. This method is suggested for steep waterways since it will not allow unreasonable encroachments. The resulting floodway widths varied from 30 feet to 100 feet.

Initial elevations for the design-flood profiles for Murphy Creek were determined from a slope-conveyance study in the lower reach where all but the 0.2-percent-annual-chance flood were well contained in a rectified channel. A floodway analysis was not required on Murphy Creek. Headwater elevations at the Southside Road bridge were computed using the U.S Geological Survey computer program A-526 (Reference 22). Supercritical flows were encountered at two cross sections (E and I), and the model was reset using critical-depth elevations at each cross section. The 0.2-percent-annual-chance flood overflows Southside Road near the intersection of Williams Highway. Bypass flows then merge with Applegate River and do not re-enter the Murphy Creek channel. The extent of road overflow was estimated because a composite stage-discharge relation could not be established at the bridge.

Murphy Creek main-channel bed material consisted of loose rocks and boulders, and floodplain vegetation consisted of areas of unimproved pastureland, and moderate to dense brush and tree growth.

The flood profiles for the Illinois River began at a point 300 feet downstream from a gaging station near Kerby (No. 14377100). The stage-discharge relation developed at the gage was used to determine initial elevations. The velocity distribution in a vast ponding of water at Sauers Flat, upstream from the gage, is uncertain due to eddy currents and slack water. The limits of the effective velocities were then estimated until upstream profile elevations agreed with a stage-discharge relation established at a discontinued gaging station (No. 1437000) located at the Finch Road bridge in Kerby, 3.6 miles upstream from the initial cross section.

A low diversion dam near Cave Junction (Pomeroy Dam) was completely submerged by all flows and did not affect profile elevations. As previously mentioned, the computation of flood profiles continued uninterrupted up East Fork Illinois River to Sucker Creek. As the Illinois and East Fork Illinois Rivers were treated as essentially one river, cross section locations on the East Fork Illinois River refer to the starting point of the profiles, Illinois River Mile 50.0, approximately 6.4 miles downstream from the confluence of the Illinois, East Fork Illinois, and West Fork Illinois Rivers.

Cross section data for Illinois and East Fork Illinois Rivers were obtained from photogrammetry based on aerial photographs taken on September 30, 1978 (Reference 19). Bridge geometry and underwater portions of the cross sections were surveyed in January 1979.

There was a wide range in main-channel bed material throughout this study reach. In the canyon area north of Kerby, bed material consisted of boulders and bedrock outcrops. In the ponded reaches of Souers Flat, bed material consisted of soft bottom material with brushy banks.

Floodplain vegetation consisted of pastureland grass, cultivated farm lands (often bare during flood season), moderate to heavy brush and tree growth, and dense, deciduous brush and tree growth.

Effective velocities at Sauers Flat were estimated by assigning high "n" values to reduce the conveyance in the noncontributing areas of the floodplain. This technique was also used on East Fork Illinois River, upstream from the Redwood Highway. Extensive areas of shallow flooding were judged noncontributing because of the bank configuration upstream from cross sections M and N.

Initial water-surface elevations for the second segment of the East Fork Illinois River were determined by using the converging profile technique through five cross sections ending at cross section A. The effective channel at cross sections A and B was adjusted to exclude the embayment at the mouth of Little Elder Creek.

Supercritical flows were encountered at a narrow canyon near cross section J. The hydraulic model was reset using a critical depth elevation, and the profiles continued uninterrupted through the remainder of the reach.

Bed material in the commonly braided main channel consisted of large areas of unstable rock and gravel deposits. There are bedrock outcroppings and large, rounded boulders in the narrow confines of the canyons, but, generally, the entire reach appears subject to considerable movement of bed material. Flood plain vegetation consisted of some areas of pastureland, but moderate to heavy brush and trees predominated.

Flood profiles for the first segment of the West Fork Illinois River began at its mouth and reflect concordant flow conditions from the main stem of the Illinois River. Backwater from a 1-percent-annual-chance flood would extend 4,460 feet up the West Fork Illinois River channel. The initial concordant flow (or backwater) and was derived by modeling the base flood from Pomeroy Dam to the initial section at the mouth.

The effective velocities at the west bank of cross section J were uncertain due to the configuration of the upstream channel. The cross section width was therefore arbitrarily reduced to exclude an eddy flow situation.

The main-channel bed material consisted of large areas of irregular bedrock outcropping overlain in places by loose sand and gravel deposits. Wide gravel bars are evident where the low-water channel is deeply entrenched near one of the banks. Flood plain vegetation consisted of moderate to dense brush and tree growth.

Initial water-surface elevations for the second segment of the West Fork Illinois River profiles were derived by a convergence run through a reach (five cross sections) ending at cross section A. Flow was tranquil throughout the reach; the only problem encountered was a bypass-flow situation at the Redwood Highway bridge in O'Brien.

The low north bank of the channel upstream from the bridge allows water to flow toward the intersection of Lone Mountain Road and Redwood Highway, located 1,800 feet north of the channel. It is possible that some of the water overflows the intersection and bypasses the entire reach downstream from the bridge.

For the purpose of this study, it was assumed that the entire road overflow was limited to 850 feet of roadway immediately north of the bridge. This limitation was based on the position of the upstream berm which contains all flow at the approach cross section (cross section L).

Main channel bed material consisted of gravel bars at sharp channel curvatures, bedrock outcrops that formed deep low-flow pools and boulder-strewn reaches that appear unstable. Floodplain vegetation varied from pastureland grass to areas of dense brush and trees.

The initial elevations for the flood profiles on Deer Creek were estimated by a convergence run through a reach with six cross sections ending at cross section A.

McMullin and Thompson Creeks are tributaries that parallel Deer Creek throughout much of the central portion of this study reach. Although there is an exchange of peak flows near cross section R, it was assumed most inflow occurred at cross section P.

Main channel bed material consisted of sizable areas of rock and gravel deposits which are subject to considerable movement during flood stages. Floodplain vegetation varied from pasture grass to dense brush and tree growth. Large acreages of cultivated farmland also occupy the floodplains.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

The hydraulic analyses for this study were based on unobstructed flow conditions. The flood elevations thus derived are considered valid only if there are no significant changes made to the existing drainage structures or to other physical features of the channels (such as changes

in alignment and vegetation).

3.3 Vertical Datum

All FIS reports and FIRMS are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the completion of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are now prepared using NAVD 88 as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRMs are referenced to NAVD 88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the NGVD and the NAVD, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242
(301) 713-4172 (fax)

The conversion factor from NGVD to NAVD for all flooding sources in this report is +3.36 feet.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description and/or location information for benchmarks shown on the FIRMs, please contact information services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as

additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at scales of 1:2,400, 1: 4,800, and 1:62,500, with contour intervals of 2, 4, and 80 feet, respectively (References 8, 17, and 19).

Gilbert Creek boundaries were determined on the basis of random topographic elevations taken during the field surveys. They may, therefore, not show local variations of either higher or lower terrain between points of definition.

For streams studied by approximate methods, the boundary of the 1-percent-annual-chance flood were taken from the Flood Hazard Boundary Map (Reference 3).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the Flood Insurance Rate Map.

Countywide Update

As part of the countywide update, floodplain boundaries were digitized from the effective FIRM and Floodway panels. USGS topographic maps (Reference 25) and aerial photography (Reference 26) were used to adjust floodplain and floodway boundaries where appropriate.

The 1- and 0.2-percent-annual-chance floods were redelineated on Gilbert Creek and portions of the Rogue River using new topography with a one-foot contour interval provided by the City of Grants Pass (Reference 27). The cross section locations were digitized from the effective Floodway panels or work maps. Elevations used for the redelineation were taken from the effective floodway data tables and adjusted to the NAVD88 vertical datum. The redelineation along Gilbert Creek extended from SW Rogue River Avenue to just upstream of NW Windsor Drive, a distance of approximately 2.5 miles. Redelineation along the Rogue River extended from approximately river station 111,810 (cross section CD) to river station 158,250 (cross section DJ).

In accordance with FEMA Procedure Memorandum 36 (Reference 28), profile baselines have been included in all areas of detailed study. Profile baselines are shown in the location of the original stream centerline or original profile baseline without regard to the adjusted floodplain position on the new base map. This was done to maintain the relationship of distances between cross sections along the profile baseline between the hydraulic models, flood profiles and floodway data tables.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 6). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

For the purpose of developing the 1-percent-annual-chance floodway for the Rogue River, all of the flow was assumed to be confined to the main stem channel and its immediately adjacent overbank.

As agreed upon by county representatives and FEMA, the computation of floodways on the Rogue River, downstream of Pass Creek, on Murphy Creek, and on Gilbert Creek were not a requirement of this study.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

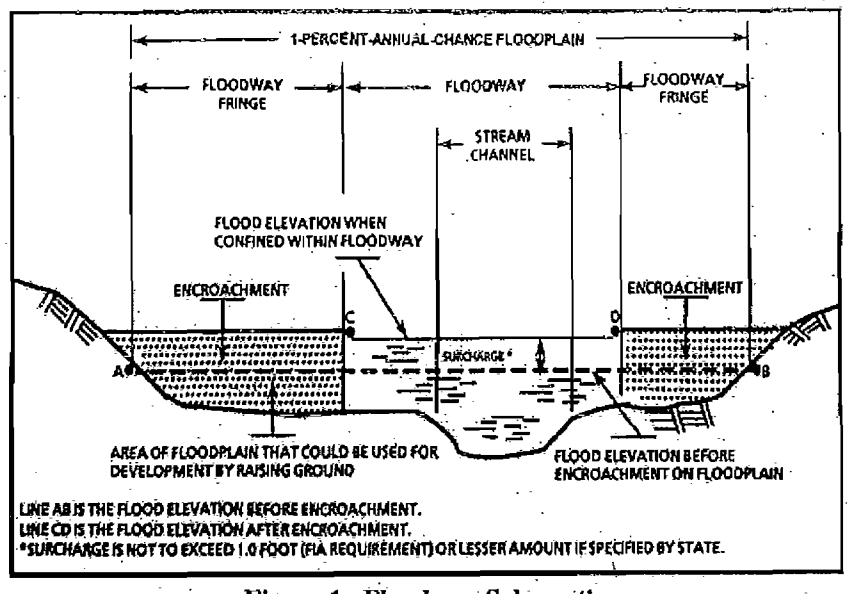


Figure 1. Floodway Schematic

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Applegate River								
A	3,960	463	5,210	15.0	876.9	872.7[2]	872.7[2]	0.0
B	7,980	2,900	13,100	6.0	883.8	882.8[2]	883.5[2]	0.7
C	10,860	1,530	8,000	9.8	890.3	889.6[2]	890.2[2]	0.6
D	12,780	670	6,740	11.6	896.2	896.2	896.6	0.4
E	14,160	580	8,240	9.5	901.1	901.1	901.4	0.3
F	15,300	560	7,240	10.8	905.7	905.7	905.7	0.0
G	15,900	880	14,000	5.6	909.5	909.5	909.5	0.0
H	17,080	1,860	17,800	4.4	909.9	909.9	910.3	0.4
I	18,560	1,840	10,300	7.6	911.4	911.4	911.9	0.5
J	20,350	1,010	7,130	10.2	916.2	916.2	917.2	1.0
K	21,200	778	6,420	11.3	919.5	919.5	919.6	0.1
L	23,480	571	8,300	8.8	926.5	926.5	926.5	0.0
M	24,920	570	6,200	11.4	928.9	928.9	929.4	0.5
N	27,160	234	4,440	16.0	934.9	934.9	935.9	1.0
O	29,480	517	8,960	7.9	942.7	942.7	943.7	1.0
P	31,810	355	4,820	14.7	946.9	946.9	947.5	0.6
Q	33,840	366	5,640	12.6	954.3	954.3	955.2	0.9
R	36,100	296	5,420	13.1	960.7	960.7	961	0.3
S	38,170	915	10,200	7.0	965.9	965.9	966.2	0.3
T	40,730	248	4,010	17.7	969.6	969.6	970.4	0.8
U	42,500	492	7,150	9.9	980.0	980.0	981.0	1.0
V	44,540	263	4,820	14.7	985.6	985.6	985.8	0.2
W	46,600	897	13,200	5.4	991.5	991.5	991.5	0.0
X	48,390	1,330	9,980	7.1	993.1	993.1	993.2	0.1

[1] Feet Above Confluence with Rogue River [2] Elevation Computed without Consideration of Backwater from Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

APPLEGATE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Applegate River (continued)								
Y	51,830	1,830	13,600	5.2	998.8	998.8	999.2	0.4
Z	54,160	520	4,300	16.5	1003.5	1003.5	1004	0.5
AA	55,530	550	6,360	11.2	1012.5	1012.5	1012.5	0.0
AB	57,740	900	10,200	6.9	1016.2	1016.2	1017.2	1.0
AC	59,520	600	6,843	10.4	1019.8	1019.8	1020.3	0.5
AD	61,520	1690	13,700	5.2	1,026.7	1,026.7	1,027.0	0.3
AE	64,540	1090	8,990	7.9	1,033.6	1,033.6	1,033.9	0.3
AF	67,470	1300	13,700	5.2	1,038.6	1,038.6	1,039.1	0.5
AG	69,360	830	6,930	10.2	1,042.2	1,042.2	1,042.6	0.4
AH	69,810	520	5,100	13.0	1,045.9	1,045.9	1,045.9	0.0
AI	70,370	455	4,660	14.3	1,048.5	1,048.5	1,049.2	0.7
AJ	70,820	562	6,720	9.9	1,053.6	1,053.6	1,053.6	0.0
AK	71,710	1110	10,200	6.5	1,054.7	1,054.7	1,055.5	0.8
AL	73,510	853	7,570	8.8	1,057.1	1,057.1	1,058.0	0.9
AM	75,230	678	7,300	9.1	1,062.0	1,062.0	1,062.9	0.9
AN	76,770	650	6,800	9.8	1,066.4	1,066.4	1,067.2	0.8
AO	77,870	575	5,730	11.6	1,069.5	1,069.5	1,070.1	0.6
AP	79,840	1765	11,400	5.8	1,076.0	1,076.0	1,076.2	0.2
AQ	82,800	1930	9,250	7.2	1,081.1	1,081.1	1,082.1	1.0
AR	84,870	872	6,850	9.7	1,088.1	1,088.1	1,089.0	0.9

[1] Feet Above Confluence with Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

APPLEGATE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Deer Creek								
A	0	463	2,873	6.6	1,296.3	1,296.3	1,297.3	1.0
B	1,010	640	2,989	6.4	1,298.9	1,298.9	1,299.6	0.7
C	1,960	494	3,836	5.0	1,301.1	1,283.1	1,302.1	1.0
D	3,120	459	2,161	8.8	1,302.8	1,302.8	1,303.8	1.0
E	3,330	490	3,390	5.6	1,307.7	1,307.7	1,307.8	0.1
F	3,760	440	4,141	4.6	1,308.2	1,308.2	1,308.5	0.3
G	4,290	300	2,827	6.7	1,308.6	1,308.6	1,308.8	0.2
H	4,670	350	2,638	7.2	1,309.0	1,309.0	1,309.4	0.4
I	6,570	384	2,152	8.8	1,314.8	1,314.8	1,314.9	0.1
J	8,280	570	4,321	4.4	1,320.3	1,320.3	1,321.1	0.8
K	9,410	384	2,352	8.1	1,322.3	1,322.3	1,323.2	0.9
L	10,660	590	2,419	7.9	1,328.1	1,328.1	1,328.4	0.3
M	11,760	500	2,586	7.4	1,332.9	1,332.9	1,333.9	1.0
N	12,770	450	2,703	7.0	1,336.3	1,336.3	1,337.0	0.7
O	14,130	700	3,345	5.7	1,340.8	1,340.8	1,341.5	0.7
P	15,250	592	2,261	6.4	1,344.6	1,344.6	1,345.4	0.8
Q	16,770	383	1,976	7.3	1,350.2	1,350.2	1,351.2	1.0
R	17,920	1,037	2,498	5.8	1,355.6	1,355.6	1,356.2	0.6
S	18,930	900	3,678	3.9	1,360.2	1,360.2	1,361.1	0.9
T	20,030	870	2,754	5.2	1,364.2	1,364.2	1,365.1	0.9
U	21,200	580	2,374	6.1	1,369.3	1,369.3	1,369.8	0.5
V	22,750	850	1,621	8.9	1,376.8	1,376.8	1,377.7	0.9
W	24,200	700	3,202	4.5	1,384.0	1,384.0	1,384.8	0.8
X	25,610	417	1,638	8.8	1,389.3	1,389.3	1,389.7	0.4
Y	26,710	540	2,306	6.2	1,396.0	1,396.0	1,396.5	0.5

[1] Feet Above River Mile 3.5

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Illinois River								
A	3,010	447	13,594	6.4	1,250.4	1,250.4	1,250.4	0.0
B	5,050	1,480	42,168	2.1	1,251.2	1,251.2	1,251.2	0.0
C	6,390	1,240	27,960	3.1	1,251.3	1,251.3	1,251.3	0.0
D	7,690	1,220	23,803	3.7	1,251.3	1,251.3	1,251.4	0.1
E	8,990	1,280	24,005	3.6	1,251.4	1,251.4	1,251.7	0.3
F	10,400	1,380	23,021	3.8	1,251.5	1,251.5	1,252.0	0.5
G	11,600	1,646	23,997	3.6	1,251.9	1,251.9	1,252.5	0.6
H	12,690	2,100	25,985	3.3	1,252.1	1,252.1	1,252.9	0.8
I	14,000	2,440	33,658	2.6	1,252.4	1,252.4	1,253.3	0.9
J	15,220	2,200	29,269	3.0	1,252.6	1,252.6	1,253.5	0.9
K	16,670	1,660	20,557	4.2	1,253.0	1,253.0	1,253.8	0.8
L	18,130	1,256	13,592	5.5	1,253.6	1,253.6	1,254.5	0.9
M	19,720	1,310	11,766	6.3	1,254.8	1,254.8	1,255.8	1.0
N	20,600	1,300	11,006	6.8	1,256.2	1,256.2	1,257.2	1.0
O	22,080	1,080	9,489	7.9	1,259.9	1,259.9	1,260.6	0.7
P	23,520	733	10,297	7.3	1,262.6	1,262.6	1,263.3	0.7
Q	24,550	674	10,641	7.0	1,263.7	1,263.7	1,264.4	0.7
R	25,750	729	12,025	6.2	1,265.1	1,265.1	1,265.8	0.7
S	26,640	829	11,623	6.4	1,265.9	1,265.9	1,266.6	0.7
T	27,600	738	11,048	6.8	1,266.8	1,266.8	1,267.6	0.8
U	28,870	404	6,262	11.9	1,268.5	1,268.5	1,269.1	0.6
V	29,940	471	7,645	9.8	1,271.9	1,271.9	1,272.1	0.2
W	31,020	686	8,534	8.7	1,274.9	1,274.9	1,275.1	0.2
X	31,860	385	6,587	11.3	1,277.2	1,277.2	1,277.6	0.4

[1] Feet Above River Mile 50.0

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Illinois River (continued)								
Y	33,000	650	8,133	9.2	1,282.4	1,282.4	1,283.1	0.7
Z	33,730	600	9,721	7.7	1,284.7	1,284.7	1,285.4	0.7
AA	34,740	1020	11,901	6.3	1,286.9	1,286.9	1,287.5	0.6

[1] Feet Above River Mile 50.0

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
East Fork Illinois River								
A	37,490	1,948[2]	18,382	4.1	1,290.4	1,290.4	1,291.3	0.9
B	38,480	579	6,175	8.0	1,292.1	1,292.1	1,292.9	0.8
C	39,690	345	3,934	12.5	1,296.2	1,296.2	1,297.0	0.8
D	40,140	657	7,903	6.2	1,302.4	1,302.4	1,302.4	0.0
E	40,870	770	6,082	8.1	1,303.4	1,303.4	1,303.4	0.0
F	41,870	900	6,649	7.4	1,305.8	1,305.8	1,306.3	0.5
G	43,010	900	10,105	4.9	1,308.2	1,308.2	1,309.2	1.0
H	44,370	1,010	7,270	6.8	1,310.8	1,310.8	1,311.7	0.9
I	45,530	1,140	9,506	5.2	1,314.8	1,314.8	1,315.8	1.0
J	47,260	1,000	6,659	7.4	1,320.2	1,320.2	1,321.2	1.0
K	48,350	835	7,108	6.9	1,324.2	1,324.2	1,325.2	1.0
L	49,240	800	7,124	6.9	1,327.0	1,327.0	1,327.7	0.7
M	50,550	1,118	8,714	5.2	1,330.4	1,330.4	1,330.6	0.2
N	52,170	1,325	7,461	6.1	1,333.4	1,333.4	1,334.4	1.0
O	53,160	1,580	8,298	5.5	1,337.2	1,337.2	1,338.2	1.0
P	54,450	1,450	8,357	5.4	1,343.0	1,343.0	1,343.5	0.5
Q	55,730	1,400	7,941	5.7	1,347.4	1,347.4	1,338.3	0.9
R	56,490	1,260	5,904	7.7	1,351.0	1,351.0	1,351.6	0.6
S	82,400	460	2,164	7.6	1,483.7	1,483.7	1,484.7	1.0
T	83,310	690	3,317	5.0	1,490.1	1,490.1	1,490.2	0.1
U	84,090	499	1,988	8.3	1,495.4	1,495.4	1,496.3	0.9
V	84,920	660	3,039	5.4	1,503.0	1,503.0	1,503.9	0.9
W	85,990	274	1,343	12.3	1,512.7	1,512.7	1,513.7	1.0
X	87,070	424	2,934	5.6	1,522.1	1,522.1	1,523.1	1.0
Y	87,770	582	1,487	11.2	1,526.2	1,526.2	1,527.0	0.8

[1] Feet Above Illinois River Mile 50.0 [2] Includes West Fork Illinois River Floodway

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

EAST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
East Fork Illinois River (continued)								
Z	88,110	733	3,317	5.0	1,532.2	1,532.2	1,532.2	0.0
AA	88,360	629	2,450	6.7	1,532.6	1,532.6	1,532.6	0.0
AB	89,360	207	1,205	13.6	1,538.8	1,538.8	1,538.8	0.0
AC	90,260	220	2039	7.1	1,545.3	1,545.3	1,545.3	0.0
AD	91,690	606	1,653	8.8	1,552.8	1,552.8	1,553.6	0.8
AE	92,880	389	1,542	9.4	1,566.5	1,566.5	1,567.1	0.6
AF	94,090	122	1,012	14.3	1,581.9	1,575.7	1,575.7	0.0
AG	95,030	209	1,850	7.8	1,581.9	1,581.9	1,582.3	0.4
AH	96,090	350	1,609	9.0	1,588.0	1,588.0	1,588.8	0.8
AI	97,030	394	1,939	7.5	1,597.5	1,597.5	1,598.4	0.9
AJ	98,090	375	1,725	8.4	1,606.1	1,606.1	1,607.1	1.0
AK	99,020	248	1,479	9.8	1,613.9	1,613.9	1,614.8	0.9
AL	99,820	210	1,096	13.2	1,623.3	1,623.3	1,624.0	0.7
AM	100,620	234	1,634	8.9	1,632.5	1,632.5	1,633.2	0.7
AN	101,310	286	1,277	11.4	1,638.6	1,638.6	1,639.6	1.0
AO	102,230	530	2,498	5.8	1,649.3	1,649.3	1,650.0	0.7
AP	102,940	580	1,324	11.0	1,657.3	1,657.3	1,657.5	0.2

[1] Feet Above Illinois River Mile 50.0

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

EAST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
West Fork Illinois River								
A	1,850	388	3,237	10.8	1,292.1	1286.5[2]	1286.6[2]	0.1
B	3,510	662	5,901	6.0	1,293.8	1292.1[2]	1293.0[2]	0.9
C	4,850	601	5,745	6.1	1,295.7	1295.1[2]	1296.1[2]	1.0
D	6,560	473	4,692	7.5	1,300.2	1,300.2	1,301.1	0.9
E	7,900	460	5,210	6.7	1,304.3	1,304.3	1,305.3	1.0
F	9,100	781	5,319	6.6	1,308.6	1,308.6	1,309.6	1.0
G	10,920	726	7,746	4.5	1,313.0	1,313.0	1,314.0	1.0
H	12,170	557	5,379	6.5	1,314.4	1,314.4	1,315.4	1.0
I	13,490	617	5,254	6.7	1,317.6	1,317.6	1,318.1	0.5
J	15,320	355	5,342	6.6	1,321.2	1,321.2	1,321.7	0.5
K	16,680	298	4,392	8.0	1,323.0	1,323.0	1,323.6	0.6
L	41,200	132	1,619	11.4	1,381.5	1,381.5	1,382.5	1.0
M	42,020	300	2,598	7.1	1,387.3	1,387.3	1,388.3	1.0
N	42,310	360	2,067	8.9	1,389.2	1,389.2	1,389.6	0.4
O	42,800	161	1,722	10.7	1,390.9	1,390.9	1,390.9	0.0
P	44,070	306	3,214	5.7	1,393.7	1,393.7	1,394.4	0.7
Q	45,180	200	1,835	10.0	1,395.0	1,395.0	1,395.8	0.8
R	45,940	168	1,698	10.8	1,398.3	1,398.3	1,398.4	0.1
S	47,110	200	1,492	12.3	1,405.8	1,405.8	1,405.8	0.0
T	48,120	330	2,826	6.5	1,411.7	1,411.7	1,412.1	0.4
U	49,250	634	2,735	6.7	1,415.3	1,415.3	1,415.6	0.3
V	49,910	632	2,566	7.2	1,418.7	1,418.7	1,418.7	0.0
W	50,070	590	2,031	9.1	1,422.2	1,422.2	1,422.2	0.0
X	50,880	410	1736	10.6	1,424.2	1,424.2	1,424.3	0.1

[1] Feet Above Confluence with Illinois and East Fork Illinois Rivers [2] Elevation Computed without Consideration of Backwater from Illinois River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
West Fork Illinois River (continued)								
Y	51,600	180	1726	10.7	1,431.8	1,431.8	1,432.5	0.7
Z	52,230	130	1,441	12.8	1,437.6	1,437.6	1,437.6	0.0
AA	52,920	200	1,486	12.4	1,442.1	1,442.1	1,442.4	0.3
AB	53,660	131	1,308	14.1	1,448.1	1,448.1	1,448.6	0.5

[1] Feet Above Confluence with Illinois and East Fork Illinois Rivers

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK ILLINOIS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Jumpoff Joe Creek								
A	300	157	1,490	10.5	830.2	785.0[2]	785.0[2]	0.0
B	950	204	2,220	7.1	830.2	790.8[2]	787.8[2]	0.0
C	1,920	217	1,770	8.9	830.2	790.6[2]	790.6[2]	0.0
D	2,780	177	1,450	10.9	830.2	793.6[2]	794.3[2]	0.0
E	3,340	160	1,490	10.5	830.2	796.8[2]	796.8[2]	0.0
F	4,290	172	1,300	12.1	830.2	800.7[2]	800.9[2]	0.2
G	4,930	244	2,020	7.8	830.2	804.7[2]	805.4[2]	0.7
H	5,590	145	1,300	12.1	830.2	807.0[2]	807.3[2]	0.3
I	6,480	364	4,240	6.5	830.2	811.7[2]	812.2[2]	0.5
J	7,290	273	1,730	9.1	830.2	813.5[2]	814.2[2]	0.7
K	8,330	183	1,550	10.1	830.2	818.6[2]	818.6[2]	0.0
L	9,260	229	1,720	9.1	830.3	823.7[2]	823.8[2]	0.1
M	10,120	182	1,670	9.4	830.4	826.5[2]	826.5[2]	0.0
N	11,140	108	1,080	14.6	831.4	830.0[2]	830.3[2]	0.3
O	12,210	224	1,910	8.2	836.6	836.6	836.8	0.2
P	13,120	156	1,380	11.4	839.2	839.2	839.8	0.6
Q	14,280	332	2,270	6.9	846.8	846.8	847.3	0.5
R	15,420	223	1,860	8.5	851.7	851.7	852.7	1.0
S	16,560	111	1,180	13.3	856.2	856.2	857.1	0.9
T	17,650	149	1,770	8.9	861.8	861.8	862.1	0.3
U	18,750	178	1,610	9.8	865.8	865.8	866.0	0.2
V	19,370	180	1,510	10.4	868.6	868.6	869.4	0.8
W	20,200	218	1,680	7.2	873.3	873.3	873.7	0.4
X	20,290	222	1,650	7.3	875.3	875.3	875.3	0.0
Y	21,010	287	1,740	6.9	875.5	875.5	875.9	0.4

[1] Feet Above Confluence with Rogue River [2] Elevation Computed without Consideration of Backwater from Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

JUMPOFF JOE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Jumpoff Joe Creek (continued)								
Z	22,060	280	1,670	7.2	879.0	879.0	879.3	0.3
AA	23,150	208	1,260	9.5	883.6	883.6	883.6	0.0
AB	24,220	280	1,590	7.6	888.6	888.6	888.9	0.3
AC	25,150	100	718	16.7	894.2	894.2	894.2	0.0
AD	26,500	176	995	7.7	903.5	903.5	903.6	0.1
AE	26,580	190	974	7.9	905.0	905.0	905.0	0.0
AF	27,100	146	738	10.4	907.4	907.4	907.7	0.3
AG	27,660	159	864	8.9	912.3	912.3	912.3	0.0
AH	28,570	130	790	9.7	917.1	917.1	917.1	0.0
AI	29,300	264	1,070	7.2	921.7	921.7	921.8	0.1
AJ	30,140	259	978	7.9	926.9	926.9	927.3	0.4
AK	30,580	452	1,460	5.3	930.7	930.7	930.7	0.0
AL	31,350	346	964	8.0	934.9	934.9	935.2	0.3
AM	32,160	83	604	12.7	940.8	940.8	940.8	0.0
AN	32,280	83	629	12.2	941.8	941.8	942.0	0.2
AO	33,130	153	915	8.4	947.5	947.5	947.6	0.1
AP	33,860	181	797	8.2	950.8	950.8	950.9	0.1
AQ	35,070	207	717	9.1	959.2	959.2	959.2	0.0
AR	36,120	205	825	7.9	966.4	966.4	967.2	0.8
AS	36,590	175	956	6.8	968.5	968.5	969.5	1.0
AT	37,100	184	709	9.2	973.2	973.2	973.2	0.0
AU	37,580	164	894	7.3	977.7	977.7	978.7	1.0
AV	37,970	69	488	13.4	979.7	979.7	979.9	0.2
AW	39,050	200	915	7.2	989.2	989.2	989.6	0.4

[1] Feet Above Confluence with Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

JUMPOFF JOE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Jumpoff Joe Creek (continued)								
AX	39,544	103	654	10.0	991.7	991.7	992.6	0.9
AY	39,890	75	528	12.4	993.8	993.8	994.5	0.7
AZ	40,660	86	604	10.8	1,000.1	1,000.1	1,000.1	0.0
BA	41,460	60	460	14.2	1,004.4	1,004.4	1,004.4	0.0

[1] Feet Above Confluence with Rogue River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

JUMPOFF JOE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Louse Creek								
A	980	90	307	13.7	905.4	905.4	905.4	0.0
B	1,060	110	530	7.9	908.1	908.1	908.1	0.0
C	1,480	130	465	9.0	909.7	909.7	909.7	0.0
D	1,880	75	356	11.8	914.0	914.0	914.0	0.0
E	2,280	63	361	11.7	918.9	918.9	918.9	0.0
F	2,340	64	380	11.1	919.6	919.6	919.6	0.0
G	3,050	76	354	11.9	927.0	927.0	927.0	0.0
H	3,690	98	585	7.2	932.4	932.4	932.4	0.0
I	4,070	98	377	11.2	935.6	935.6	935.6	0.0
J	4,450	81	397	10.6	940.1	940.1	940.1	0.0
K	5,060	90	485	8.7	945.0	945.0	945.0	0.0
L	6,310	200	558	7.5	954.1	954.1	954.1	0.0
M	6,520	114	398	10.6	958.1	958.1	958.1	0.0
N	6,720	129	416	10.1	962.1	962.1	962.1	0.0
O	7,220	155	439	9.6	967.0	967.0	967.0	0.0
P	7,710	113	395	10.7	975.4	975.4	975.4	0.0
Q	8,500	92	408	10.3	983.3	983.3	983.3	0.0
R	9,260	114	376	11.2	992.4	992.4	992.4	0.0
S	9,970	71	427	9.9	1,000.0	1,000.0	1,000.0	0.0
T	10,020	80	352	12.0	1,003.4	1,003.4	1,003.4	0.0
U	10,420	78	350	12.0	1,006.1	1,106.1	1,106.1	0.0
V	10,760	72	516	8.2	1,009.6	1,009.6	1,009.6	0.0
W	11,280	96	376	11.2	1,012.5	1,012.5	1,012.5	0.0
X	11,750	143	536	7.9	1,017.5	1,017.5	1,017.5	0.0
Y	11,280	175	463	9.1	1,023.4	1,023.4	1,023.4	0.0

[1] Feet Above Confluence with Jumpoff Joe Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

LOUSE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Louse Creek (continued)								
Z	12,840	195	600	7.0	1,030.8	1,030.8	1,030.8	0.0
AA	13,580	110	400	10.5	1,039.0	1,039.0	1,039.0	0.0
AB	14,000	135	446	9.4	1,044.4	1,044.4	1,044.4	0.0
AC	14,450	135	393	10.7	1,051.8	1,051.8	1,051.8	0.0
AD	14,860	150	450	9.4	1,055.8	1,055.8	1,055.8	0.0
AE	15,290	145	410	10.3	1,059.7	1,059.7	1,059.7	0.0
AF	15,680	150	580	7.2	1,064.1	1,064.1	1,064.1	0.0
AG	16,200	120	443	9.5	1,070.4	1,070.4	1,070.4	0.0
AH	16,640	105	550	8.4	1,076.3	1,076.3	1,076.3	0.0
AI	17,010	85	324	10.9	1,081.0	1,081.0	1,081.0	0.0
AJ	17,350	65	407	8.7	1,085.0	1,085.0	1,085.0	0.0
AK	17,800	95	310	11.4	1,090.2	1,090.2	1,090.2	0.0
AL	18,110	95	463	7.6	1,094.4	1,094.4	1,094.4	0.0
AM	18,560	105	335	10.5	1,099.0	1,099.0	1,099.0	0.0
AN	18,910	105	440	8.0	1,105.9	1,105.9	1,105.9	0.0
AO	19,330	173	481	7.3	1,111.0	1,111.0	1,111.0	0.0
AP	19,762	81	317	11.1	1,117.7	1,117.7	1,117.8	0.1
AQ	20,176	200	452	7.8	1,124.7	1,124.7	1,125.3	0.6
AR	20,542	90	358	9.9	1,128.3	1,128.3	1,128.5	0.2
AS	20,822	105	387	9.1	1,132.0	1,132.0	1,132.0	0.0
AT	21,384	54	299	11.8	1,137.9	1,137.9	1,137.9	0.0
AU	21,570	43	254	13.9	1,139.9	1,139.9	1,139.9	0.0
AV	21,698	55	338	10.4	1,142.4	1,142.4	1,142.5	0.1
AW	21,857	73	403	8.8	1,145.5	1,145.5	1,145.5	0.0
AX	22,842	61	297	11.9	1,154.6	1,154.6	1,154.6	0.0

[1] Feet Above Confluence with Jumpoff Joe Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

LOUSE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Louse Creek (continued)								
AY	24,012	229	482	7.3	1,173.1	1,173.1	1,173.1	0.0
AZ	24,680	28	220	16.0	1,184.5	1,184.5	1,184.5	0.0
BA	24,734	59	576	6.1	1,189.2	1,189.2	1,189.2	0.0
BB	25,520	60	263	12.0	1,196.0	1,196.0	1,196.0	0.0
BC	26,504	84	315	10.0	1,211.5	1,211.5	1,211.5	0.0
BD	26,901	88	301	10.5	1,218.4	1,218.4	1,218.4	0.0
BE	27,695	101	312	10.1	1,233.9	1,233.9	1,233.9	0.0
BF	28,652	109	370	8.5	1,246.9	1,246.9	1,247.2	0.3
BG	29,914	89	308	10.3	1,267.2	1,267.2	1,267.2	0.0
BH	30,514	92	303	10.4	1,277.9	1,277.9	1,277.9	0.0
BI	31,604	61	264	12.0	1,298.5	1,298.5	1,298.5	0.0
BJ	32,290	105	344	9.2	1,311.2	1,311.2	1,311.4	0.2
BK	32,737	47	243	12.0	1,319.2	1,319.2	1,319.2	0.0
BL	33,842	59	262	12.1	1,344.7	1,344.7	1,344.7	0.0
BM	34,556	38	228	13.8	1,362.5	1,362.5	1,362.5	0.0
BN	34,671	50	397	8.0	1,365.6	1,365.6	1,365.6	0.0

[1] Feet Above Confluence with Jumpoff Joe Creek

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Rogue River								
BU	100,000	1,360	33,500	7.1	873.4	873.4	873.4	0.0
BV	100,620	1,950	51,900	4.5	874.0	874.0	874.2	0.2
BW	101,640	2,435	51,600	4.6	874.2	874.2	874.3	0.1
BX	102,550	2,645	53,000	4.5	874.3	874.3	874.5	0.2
BY	103,330	2,890	53,400	4.4	874.6	874.6	874.8	0.2
BZ	104,330	3,735	63,300	3.7	874.8	874.8	875.0	0.2
CA	107,190	3,740	38,200	3.8	875.3	875.3	875.6	0.3
CB	108,560	3,285	33,900	4.3	875.7	875.7	876.1	0.4
CC	110,020	2,325	22,900	6.3	876.2	876.2	876.7	0.5
CD	111,810	2,245	13,200	10.9	877.7	877.7	877.9	0.2
CE	113,920	2,765	15,200	9.5	881.0	881.0	881.9	0.9
CF	115,720	3,130	17,400	8.3	885.2	885.2	885.5	0.3
CG	117,380	3,300	18,600	7.8	886.7	886.7	887.5	0.8
CH	119,420	2,940	19,400	7.4	889.9	889.9	890.2	0.3
CI	120,960	2,550	18,524	7.8	891.6	891.6	891.9	0.3
CJ	122,980	678	10,673	13.5	892.4	892.4	893.3	0.9
CK	124,632	1,047	12,004	12.0	894.8	894.8	895.7	0.9
CL	126,679	652	12,130	11.9	898.6	898.6	899.2	0.6
CM	128,409	618	10,818	13.3	901.4	901.4	902.0	0.6
CN	130,769	1,838	14,496	9.9	904.8	904.8	905.6	0.8
CO	132,049	731	13,932	10.3	908.0	908.0	908.6	0.6
CP	133,969	742	12,196	11.8	910.1	910.1	911.0	0.9
CQ	135,269	762	16,068	9.0	912.9	912.9	913.9	1.0
CR	136,563	554	14,475	9.9	913.9	913.9	914.9	1.0
CS	137,875	555	13,364	10.8	914.9	914.9	915.9	1.0

[1] Feet Above Confluence with Maple Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

ROGUE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Rogue River (continued)								
CT	139,268	414	10,741	13.4	916.0	916.0	917.0	1.0
CU	139,678	489	11,859	12.1	917.0	917.0	918.0	1.0
CV	140,369	497	11,036	13.0	917.7	917.7	918.6	0.9
CW	140,723	456	10,852	13.3	918.2	918.2	919.0	0.8
CX	142,668	602	16,008	9.0	922.1	922.1	922.6	0.5
CY	143,906	774	15,556	9.3	923.7	923.7	924.2	0.5
CZ	145,944	502	13,740	10.5	925.4	925.4	925.8	0.4
DA	146,970	386	12,059	11.9	926.2	926.2	926.5	0.3
DB	147,963	541	11,192	12.9	926.8	926.8	927.3	0.5
DC	148,960	548	12,261	11.7	928.9	928.9	929.4	0.5
DD	150,969	550	12,253	11.8	931.4	931.4	931.7	0.3
DE	152,110	510	12,100	11.9	933.1	933.1	933.2	0.1
DF	152,960	327	9,620	14.8	933.9	933.9	933.9	0.0
DG	154,090	375	10,200	14.0	936.1	936.1	936.1	0.0
DH	155,160	415	10,700	13.3	937.4	937.4	937.8	0.4
DI	157,280	431	12,300	11.5	941.1	941.1	941.6	0.5
DJ	158,250	417	11,800	12.1	942.7	942.7	942.8	0.1
DK	158,570	440	12,700	11.2	943.5	943.5	943.7	0.2
DL	159,760	363	10,800	13.1	945.0	945.0	945.4	0.4
DM	161,770	548	15,900	8.9	949.0	949.0	949.3	0.3
DN	162,840	344	8,050	17.7	949.2	949.2	949.5	0.3
DO	164,330	455	10,700	13.3	956.2	956.2	956.2	0.0
DP	166,480	426	12,100	11.8	961.0	961.0	961.0	0.0
DQ	168,240	500	12,600	11.3	964.1	964.1	964.1	0.0
DR	169,200	403	9,460	15.0	964.7	964.7	964.7	0.0
DS	170,800	460	13,000	10.9	970.0	970.0	970.6	0.6

[1] Feet Above Confluence with Maple Creek

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Slate Creek								
A	2,400	450[2]	1,950	4.6	910.3	905.7[3]	906.3[3]	0.6
B	3,170	454[2]	1,855	4.8	910.8	907.0[3]	907.5[3]	0.5
C	3,960	624[2]	2,160	4.1	911.4	909.0[3]	909.0[3]	0.0
D	4,960	713	2,780	3.2	912.8	912.2[3]	912.2[3]	0.0
E	5,880	132	891	10.0	916.7	916.7	916.7	0.0
F	6,650	264	1,390	6.4	920.3	920.3	920.5	0.2
G	7,270	250	1,410	6.3	922.1	922.1	922.7	0.6
H	7,400	250	1,790	5.0	926.0	926.0	926.0	0.0
I	8,060	376	1,720	4.7	926.8	926.8	927.1	0.3
J	9,140	101	778	10.4	929.2	929.2	930.1	0.9
K	9,900	102	736	11.0	934.2	934.2	934.9	0.7
L	11,120	155	1,200	6.8	941.8	941.8	941.8	0.0
M	11,790	173	1,000	8.1	943.8	943.8	944.0	0.2
N	12,590	84	730	11.1	947.7	947.7	948.0	0.3
O	13,430	100	943	8.6	951.9	951.9	952.9	1.0
P	14,360	120	993	8.2	956.1	956.1	956.9	0.8
Q	15,010	84	895	9.0	959.3	959.3	960.2	0.9
R	15,790	84	561	14.4	967.9	967.9	968.6	0.7
S	16,710	123	1,030	7.9	977.9	977.9	978.6	0.7

[1] Feet Above Confluence with Applegate River [2] Floodway Lies Entirely within Applegate River Floodway [3] Elevation Computed without Consideration of Backwater from Applegate River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

SLATE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Waters Creek								
A	230	58	465	3.6	1,096.2	1,096.2	1,096.2	0.0
B	840	40	184	9.2	1,097.2	1,097.2	1,097.7	0.5
C	1,742	64	346	4.9	1,106.1	1,106.1	1,106.1	0.0
D	2,103	47	192	8.8	1,106.5	1,106.5	1,107.1	0.6
E	2,348	44	265	6.4	1,111.7	1,111.7	1,111.7	0.0
F	2,731	33	265	6.4	1,115.2	1,115.2	1,115.7	0.5
G	2,866	35	219	6.0	1,115.5	1,115.5	1,116.5	1.0
H	3,163	30	117	11.3	1,118.7	1,118.7	1,118.7	0.0
I	3,387	57	263	5.0	1,122.4	1,122.4	1,122.4	0.0
J	3,671	43	166	7.9	1,122.5	1,122.5	1,122.8	0.3
K	4,587	36	125	10.6	1,133.3	1,133.3	1,133.3	1.0
L	4,961	41	238	5.5	1,140.5	1,140.5	1,140.7	0.2
M	5,148	80	361	3.7	1,143.4	1,143.4	1,144.1	0.7
N	5,336	50	310	4.3	1,145.1	1,145.1	1,145.2	0.1
O	5,597	33	148	8.9	1,145.0	1,145.0	1,145.5	0.5
P	5,852	38	147	9.0	1,147.3	1,147.3	1,147.4	0.1
Q	6,112	37	138	9.6	1,150.6	1,150.6	1,150.6	0.0
R	6,200	28	155	8.5	1,153.1	1,153.1	1,153.1	0.0

[1] Feet Above Confluence with Slate Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

FLOODWAY DATA

WATERS CREEK

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to the community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the Flood Insurance Study by approximate methods. Beeause detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Table 7 lists the flood insurance zones that each community is responsible for regulating.

Table 7. Flood Insurance Zones Within Each Community

Community	Flood Zone(s)
Cave Junction, City of	AE, X
Grants Pass, City of	AE, X
Josephine County, Unincorporated Areas	A, AE, X, D

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide Flood Insurance Rate Map presents flooding information for the entire geographic area of Josephine County. Previously, Flood Insurance Rate Maps were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide Flood Insurance Rate Map also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 8, "Community Map History."

7.0 OTHER STUDIES

In December 1965, the U.S Army Corps of Engineers published a Flood Plain Information report which described the flooding in Josephine County during the 1964 flood (Reference 29). Flood boundaries for the 1964 flood, and estimated boundaries for the 1861 flood were shown on aerial photographs. No profiles were presented.

In July 1966, the U.S. Army Corps of Engineers published a statewide Post Flood Report describing the floods that had occurred in December 1964 and January 1965 (Reference 10). A discussion of flooding from streams within Josephine County included graphic displays of cumulative precipitation and storm hydrographs.

In November 1970, USGS published a profile study for the Rogue River in a reach extending from the Grants Pass gaging station to the Lost Creek for the 1964 flood and for the 10- and 20-year floods, based on hydrology considered to be effective at that time. Also presented were cross sections and channel plan views. Profile concurrence for the design floods was not attempted because of significant changes in the hydrologic analyses due to revised flood-control estimates.

Also present were cross sections and channel plan views. Profile concurrence for the design floods was not attempted because of significant changes in the hydrologic analyses due to revised flood-control estimates.

In July 1971, the U.S. Geological Survey prepared a Flood Insurance Study for Josephine County (Reference 30). The report presented base flood elevations and estimated flood boundaries which were shown on enlarged portions of 10-minute quadrangles having 80-foot contour intervals. Flood profiles for the 500-, 100-, and 10-year floods were based on the same hydrology used in the previously described Profile Study (Reference 31). The Type-10 study did not include the incorporated area of Grants Pass.

In July 1975, the U.S. Army Corps of Engineers published a statewide Post Flood Report describing floods that had occurred in January 1974 (Reference 12). A discussion of flood magnitudes and storm damage was similar to their report issued after the 1964 floods in Oregon.

A Flood Insurance Studies have been published for the unincorporated areas of Jackson County (Reference 1 and 32). The hydrologic analysis used in the Grants Pass study is consistent with the analysis used in the Jackson County study.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP. EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Cave Junction, City of	June 1, 1982	----	June 1, 1982	----
Grants Pass, City of	March 22, 1974	November 5, 1976	April 15, 1981	September 27, 1991
Unincorporated Areas	August 16, 1977	----	June 1, 1982	December 1, 1983 September 27, 1991

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

Flood Studies were prepared for the incorporated area of Cave Junction (Reference 33), and for the incorporated area of Grants Pass (Reference 34). All data presented in these studies agree exactly with data presented herein.

In November 1974, a Flood Hazard Boundary Map was published for Cave Junction (Reference 35). This Flood Insurance Study is more detailed and, thus, supersedes that map.

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Mitigation Division, Federal Regional Center, 130 228th Street, SW, Bothell, Washington 98021-9796.

9.0 BIBLIOGRAPHY AND REFERENCES

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10. U.S. Department of the Army, Corps of Engineers, Portland District, Post Flood Report, Portland, Oregon, July 1966

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23. U.S. Department of the Interior, Geological Survey, Water Resources Division, "Measurement of Peak Discharge at dams by Indirect Methods," Techniques of Water-Resources Investigations, Book 3, Chapter A-5, Harry Husling, 1967

24. H.W. and E.F. Brater, Handbook of Hydraulics, 4th Edition, New York: McGraw-Hill Book Company, 1954

25. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps:

Map Name	Date	Scale	Contour Interval
Applegate	1983	1:24,000	40 ft
Buckskin Peak	1989	1:24,000	40 ft
Bunker Creek	1989	1:24,000	40 ft
Cave Junction	1989	1:24,000	40 ft
Eight Dollar Mountain	1989	1:24,000	40 ft
Galice	1989	1:24,000	40 ft
Glendale	1986	1:24,000	40 ft
Golden	1986	1:24,000	40 ft
Grants Pass	1986	1:24,000	40 ft
Holland	1989	1:24,000	40 ft
Kelsey Peak	1989	1:24,000	40 ft
Kerby Peak	1986	1:24,000	40 ft
King Mountain	1983	1:24,000	40 ft
Merlin	1986	1:24,000	40 ft
Mount Reuben	1989	1:24,000	40 ft
Murphy	1986	1:24,000	40 ft
Murphy Mountain	1986	1:24,000	40 ft
O'Brien	1989	1:24,000	40 ft
Onion Mountain	1989	1:24,000	40 ft
Rogue River	1983	1:24,000	40 ft
Selma	1989	1:24,000	40 ft
Sexton Mountain	1986	1:24,000	40 ft
Takilma	1989	1:24,000	40 ft
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35. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Cave Junction, Oregon, Scale 1:12,000, 1974

10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original Flood Insurance Study was printed. Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To assure that any user is aware of all revisions, it is advisable to contact the community repository for your community.

All previous study revision descriptions have been incorporated into the appropriate sections of this FIS. Table 9 summarizes the flooding sources updated since the original study was completed.

Table 9. Revised Study Descriptions

Flooding Source	Community	Limits of Study	Revision Date	Panel Number(s)
Rogue River	Josephine County Unincorporated Areas and the City of Grants Pass	From approximately 3.5 miles downstream to 2.2 miles upstream of the South 6th Street bridge	September 19, 1990	0484, 0492, 0503, 0511, 0512, and 0516
Rogue River	Josephine County Unincorporated Areas and the City of Grants Pass	From approximately 5.2 miles downstream to 3.5 miles upstream of the South 6th Street bridge	November 2008	0491, 0492, 0503, 0511, 0512, 0516, 0517
Louse Creek	Josephine County Unincorporated Areas	From approximately 470 feet downstream of Monument Drive to Granite Hill Road	September 19, 1990	0314, 0501, and 0502
Applegate River	Josephine County Unincorporated Areas	From the upstream end of the initial analysis to the Josephine-Jackson County line	September 19, 1990	0708, 0710, 0720, 0740, and 0750
Waters Creek	Josephine County Unincorporated Areas	From its confluence with Slate Creek upstream approximately 1 mile	September 19, 1990	0656
Gilbert Creek	City of Grants Pass	From SW Rogue River Avenue to just upstream of NW Windsor Drive	November 2008	0504

Countywide Update (December 3, 2009)

The countywide update was completed in November 2008 by WEST Consultants, Inc. for FEMA under Contract No. EMS-2001-CO-0068.

This update combined the Flood Insurance Rate Maps and Flood Insurance Study reports for Josephine County and incorporated communities into the countywide format. Under the countywide format, FIRM panels have been produced using a single layout format for the entire area within the county instead of separate layout formats for each community. The single-layout format facilitates the matching of adjacent panels and depicts the flood-hazard area within the entire panel border, even in areas beyond a community's corporate boundary line. In addition, under the countywide format this single FIS report provides all associated information and data for the entire county area.

As part of this revision, the format of the map panels has changed. Previously, flood-hazard information was shown on both FIRMs and Flood Boundary and Floodway Maps (FBFMs). In the new format, all base flood elevations, cross sections, zone designations, and floodplain and floodway boundary delineations are shown on the FIRM; the FBFM has been eliminated. Some of the flood insurance zone designations were changed to reflect the new format. Areas previously shown as numbered Zone A were changed to Zone AE. Areas previously shown as Zone B were changed to Zone X (shaded). Areas previously shown as Zone C were changed to Zone X (unshaded). In addition, all Flood Insurance Zone Data Tables were removed from the FIS report and all zone designations and reach determinations were removed from the profile panels.

All flood elevations shown in this FIS report and on the FIRM panels were converted from NGVD 29 to NAVD 88. The conversion factor from NGVD to NAVD for all streams in this report is +3.36 feet.

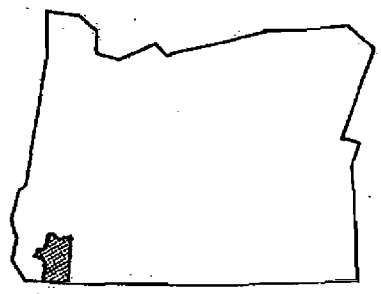
The 1- and 0.2-percent-annual-chance floods were redelineated on Gilbert Creek and portions of the Rogue River using new topography with a one-foot contour interval provided by the City of Grants Pass (Reference 26). The cross section locations were digitized from the effective Floodway panels or work maps. Elevations used for the redelineation were taken from the effective floodway data tables and adjusted to the NAVD88 vertical datum. The redelineation along Gilbert Creek extended from SW Rogue River Avenue to just upstream of NW Windsor Drive, a distance of approximately 2.5 miles. Redelineation along the Rogue River extended from approximately river station 111,810 (cross section CD) to river station 158,250 (cross section DJ).

The floodplain boundaries for all other flooding sources were digitized from the effective FIRM and Floodway panels. Aerial photography (Reference 25) and USGS 7.5' Quadrangles (Reference 24) were used to adjust floodplain and floodway boundaries where appropriate.

COMPLETE REPORT LOCATED IN PLANNING FILE

FLOOD INSURANCE STUDY

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS
VOLUME 2 OF 2



COMMUNITY NAME	COMMUNITY NUMBER
CAVE JUNCTION, CITY OF	410107
GRANTS PASS, CITY OF	410108
JOSEPHINE COUNTY UNINCORPORATED AREAS	415590

Effective:
December 3, 2009

PROOF COPY

Federal Emergency Management Agency
Flood Insurance Study Number
41033CV002A

COMPLETE REPORT LOCATED IN PLANNING FILE

PROOF COPY

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

MAP INDEX

PANELS PRINTED

MAP NUMBER
41033CINDEX
EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

MAP INDEX

FIRM

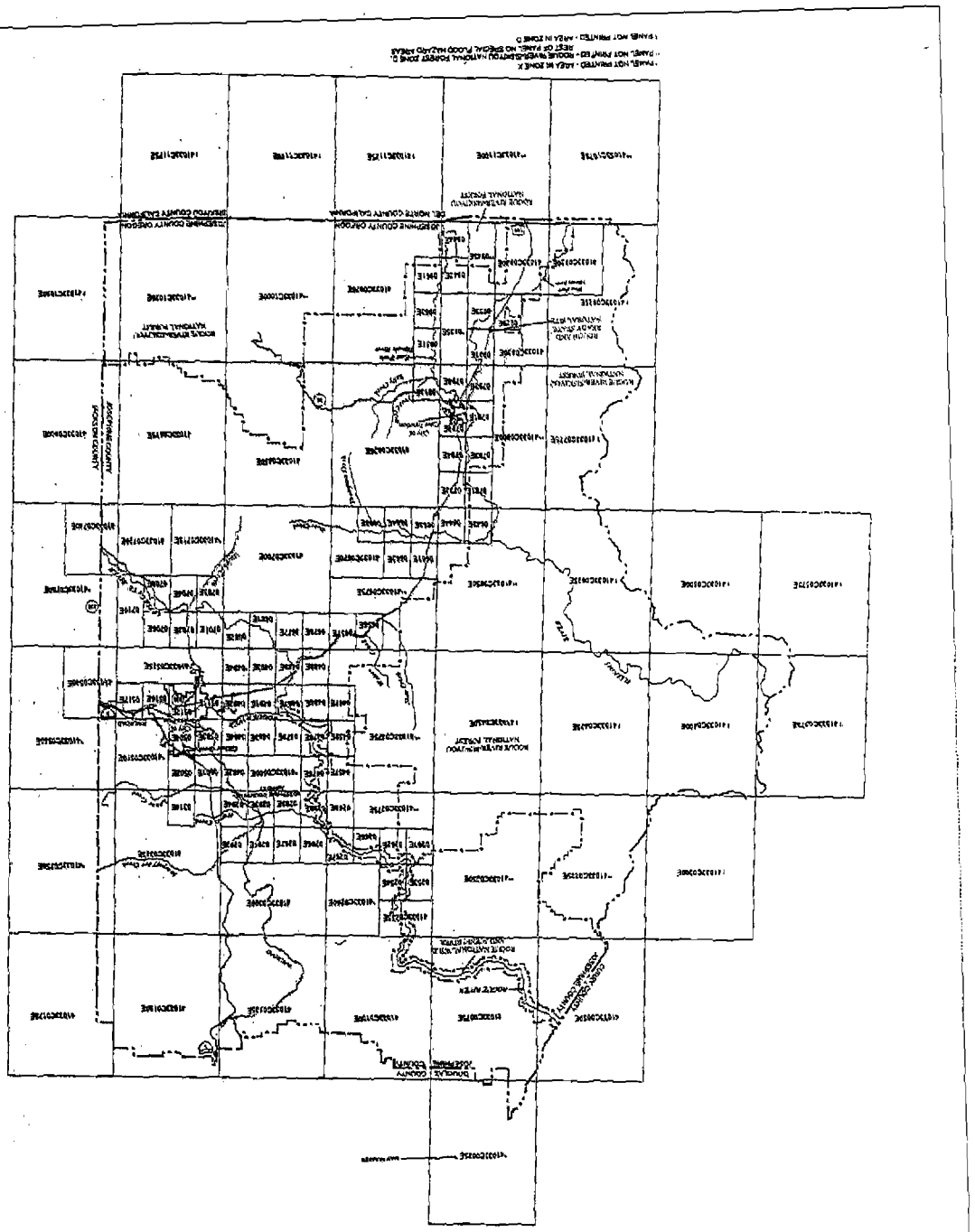
FLOOD INSURANCE RATE MAP

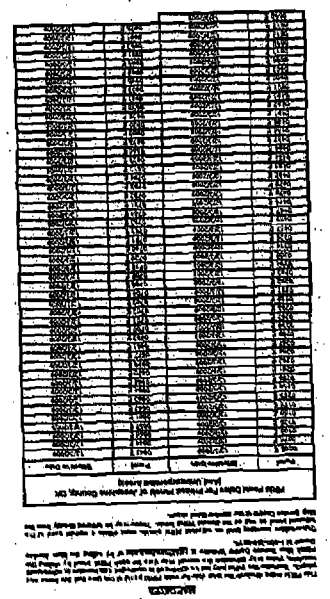
JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

PANELS PRINTED

MAP NUMBER
41033CINDEX
EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency





MAP REPOSITORIES

ELEVATION DATUM

LISTING OF COMMUNITIES

NOTICE TO USER

EXHIBIT 2

NOTES TO USERS

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Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Oregon State Plane South Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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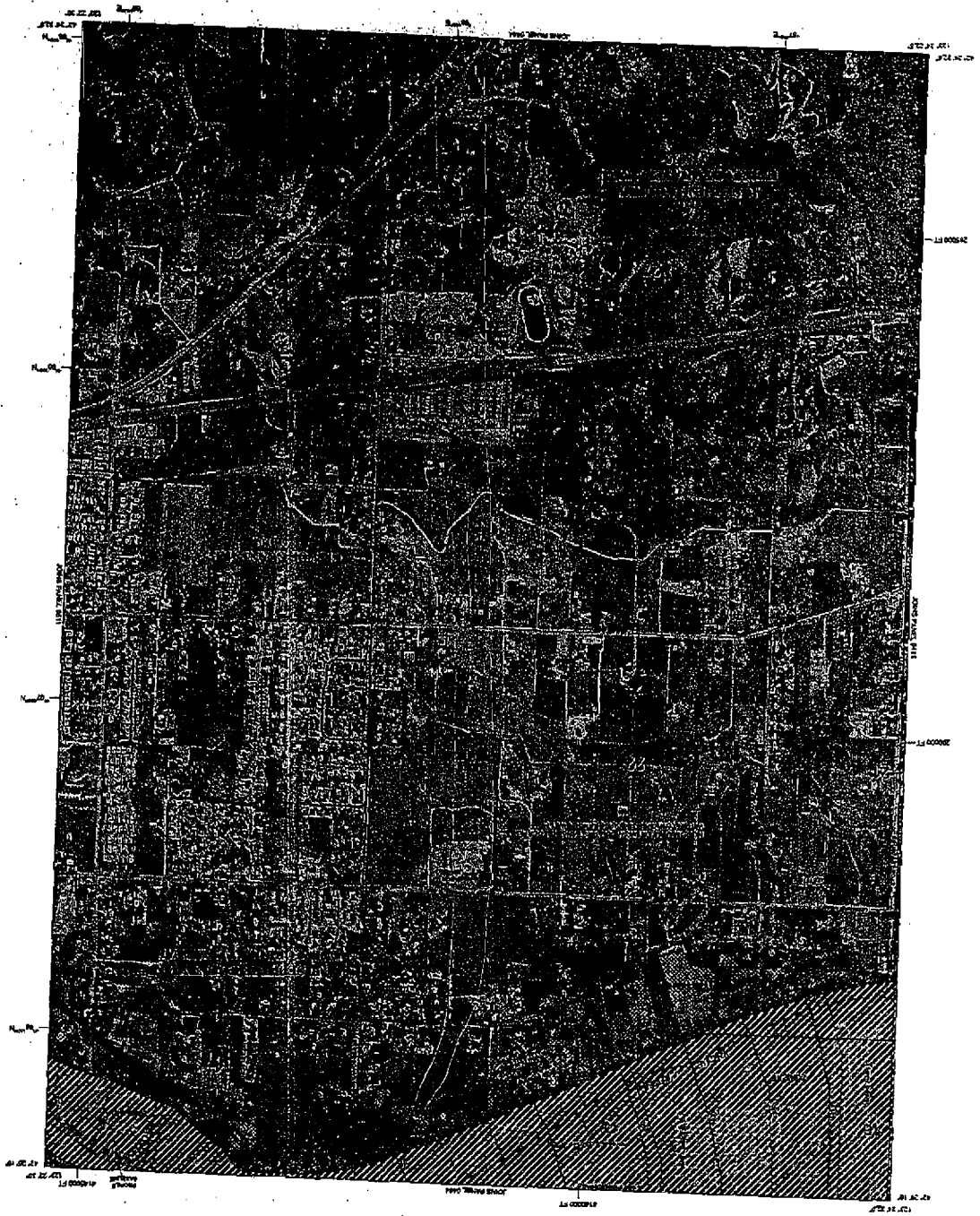

LEGEND

▇ SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

[illegible]

▨ FLOODWAY AREAS IN ZONE AE

[illegible]

▒ OTHER FLOOD AREAS

[illegible]

☐ OTHER AREAS

[illegible]

▧ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▨ OTHERWISE PROTECTED AREAS (OPAs)

[illegible]

MAP SCALE 1" = 500'

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL [illegible]

FIRM
FLOOD INSURANCE RATE MAP
JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

PANEL [illegible] OF [illegible]
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
[illegible]	[illegible]	[illegible]	[illegible]
JOSEPHINE COUNTY	[illegible]	[illegible]	[illegible]

PROOF
COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
[illegible]

EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

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(301) 713-3242

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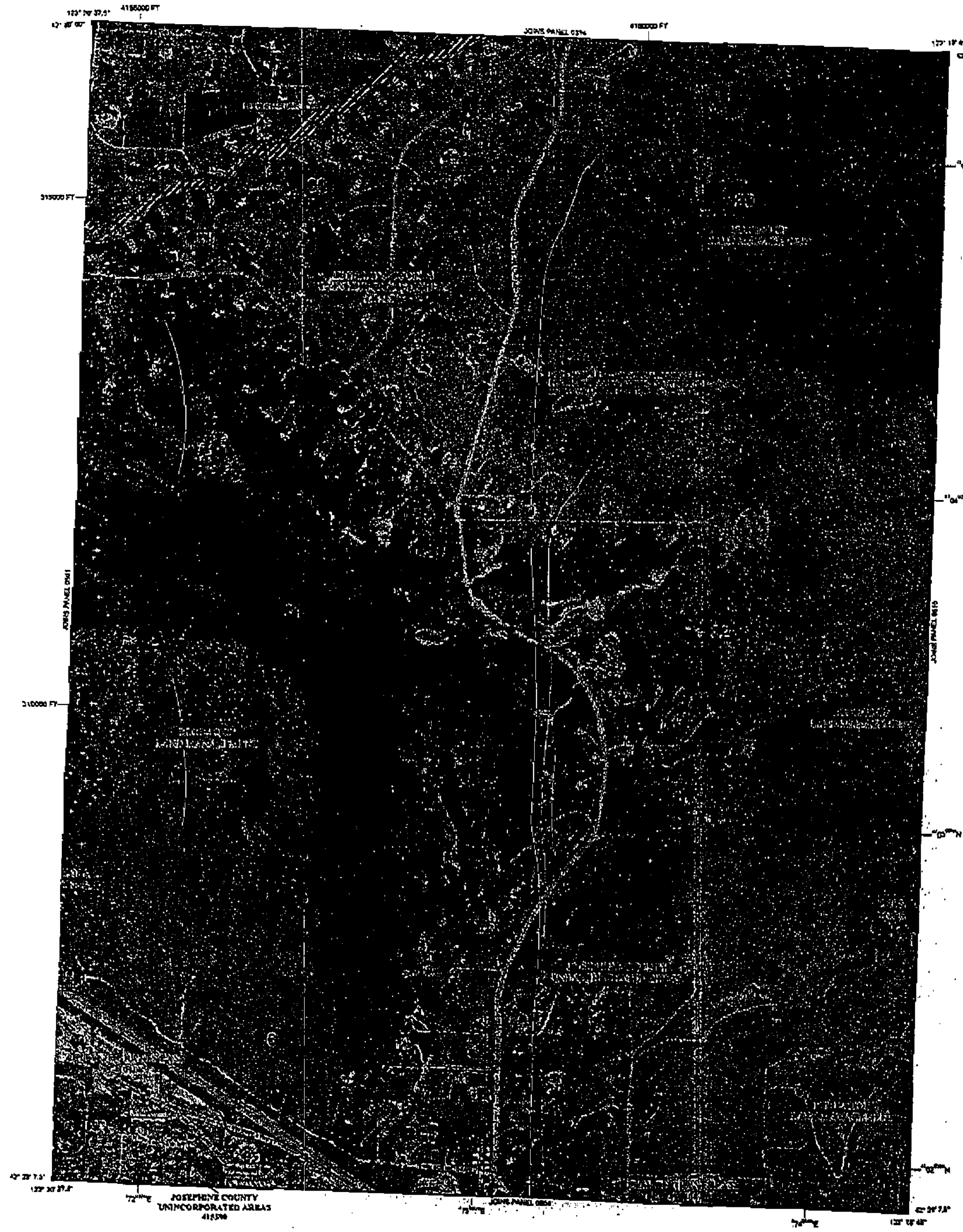

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 500'

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0502E

FIRM
FLOOD INSURANCE RATE MAP
JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 502 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410184	0502	E
JOSEPHINE COUNTY	415590	0502	E

PROOF COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0502E

EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

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National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (2008), Oregon Water Resources Department (2004), DRAIA Bureau of Land Management (2003), U.S. Fish and Wildlife Service (2008), Oregon Parks and Recreation Department (2008), and National Geodetic Survey (2007) at a scale of 1:24,000.

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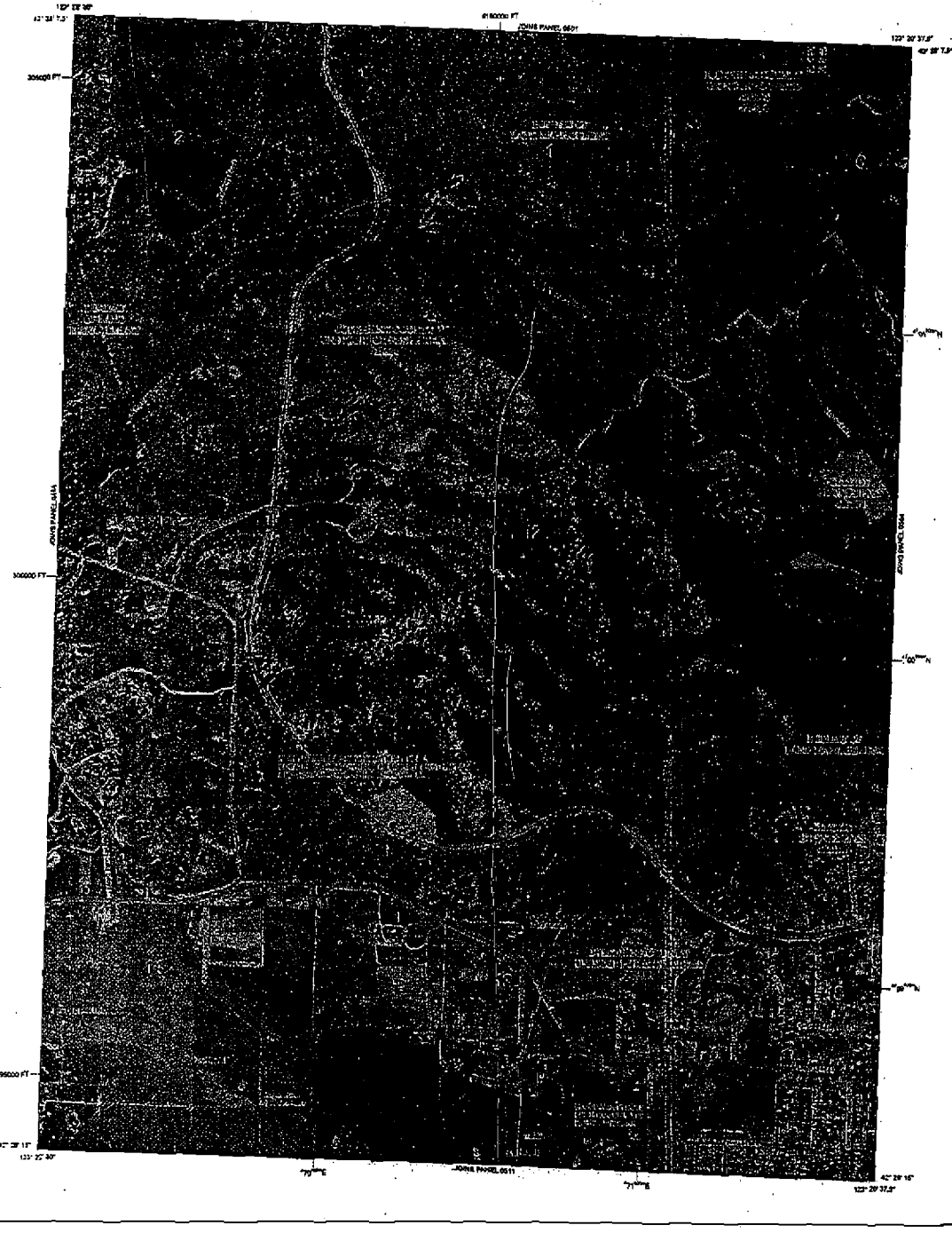

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 6000'

NFIP

PANEL 0503E

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

PANEL 503 OF 1175

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410473	0503	E
JOSEPHINE COUNTY	415591	0503	E

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Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0503E

EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

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NGS Information Services
NOAA, [illegible]
National Geodetic Survey
SSMC-3, [illegible]
1315 East-West Highway
Silver Spring, Maryland [illegible]
(301) 713-3242

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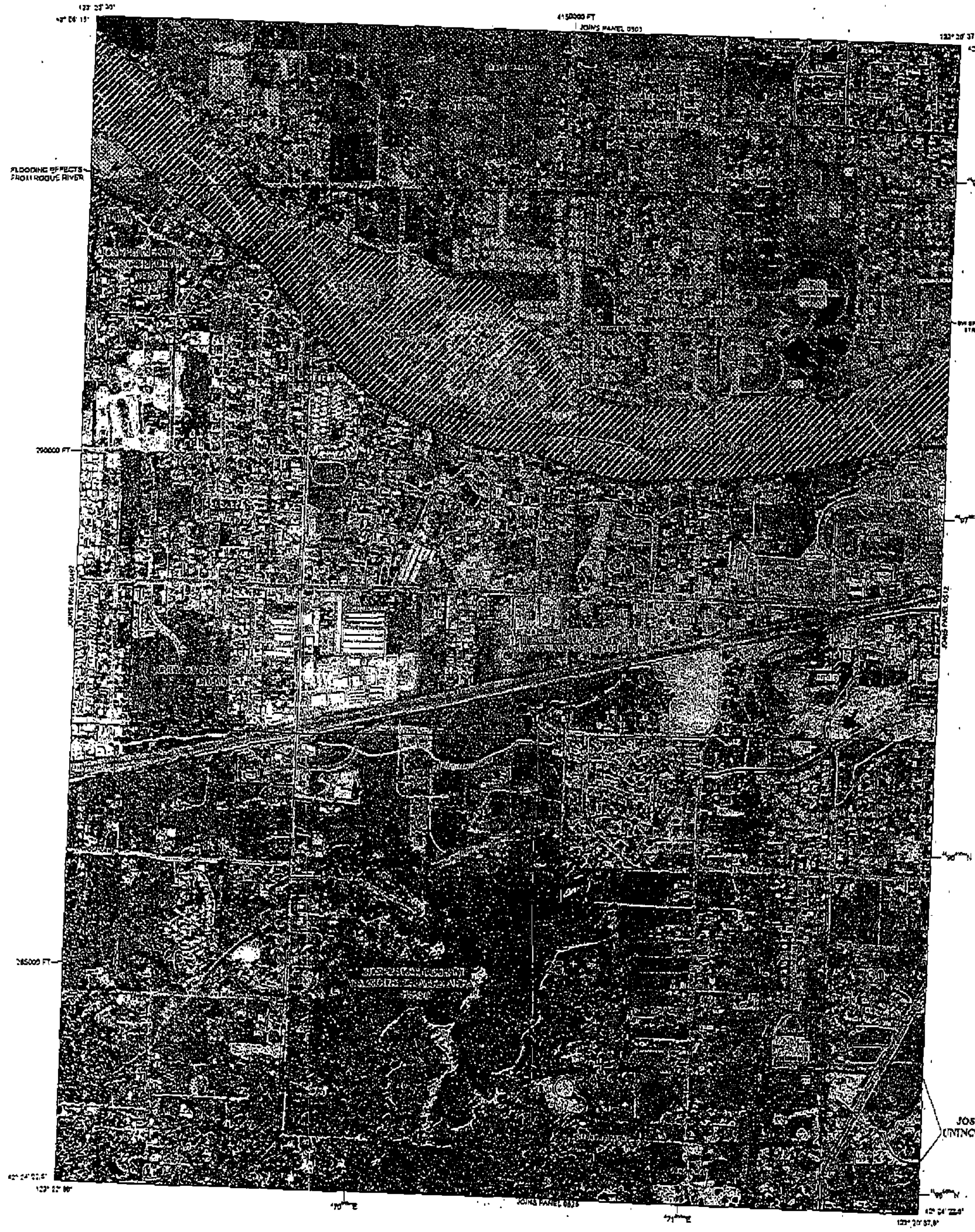

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 500'

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0511E

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 511 OF 1176
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

PROOF COPY

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MAP NUMBER
41033C0511E

EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

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Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713- 3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (2006); Oregon Water Resources Department (2006); ORMAP, Bureau of Land Management (2002); U.S. Fish and Wildlife Service (2002); Oregon Parks and Recreation Department (2006); and National Geospatial Survey (2007), at a scale of 1:24,000.

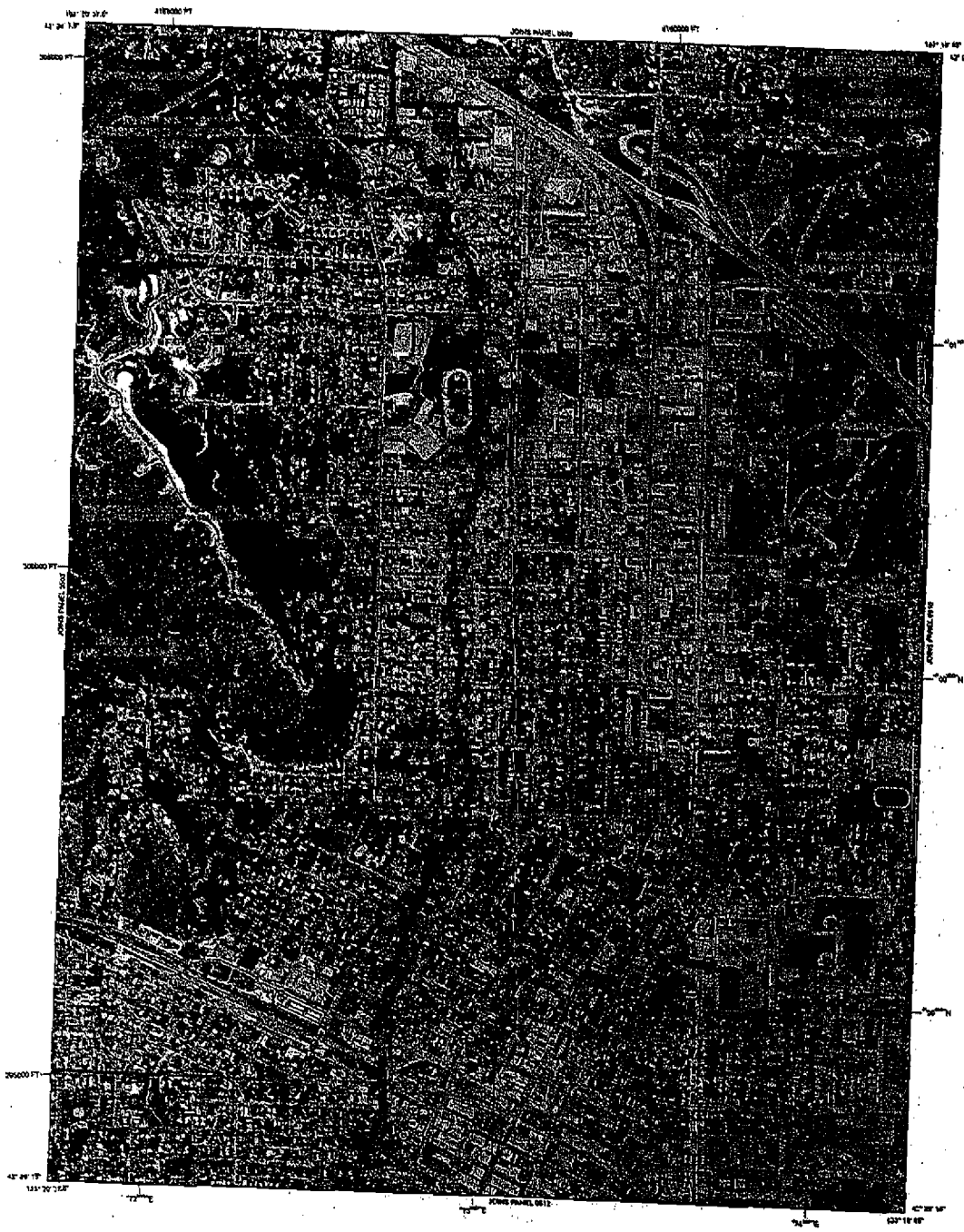
The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877- FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A1-A30, AR, V1-V30, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE U — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet*

Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid values, zone 10N

5000-foot grid ticks: Oregon State Plane South Zone (FIPS Zone 3602), Lambert Conformal Conic projection

Bench mark (see explanation in Notes to Users section of this FIRM panel)

River mile

MAP REPOSITORY
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
DECEMBER 3, 2008

Effective date(s) of revision(s) to this panel

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

NFIP

PANEL 0508E

FIRM

FLOOD INSURANCE RATE MAP
JOSEPHINE COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 0508 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410095	0508	E
JOSEPHINE COUNTY	410094	0508	E

PROOF COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0508E
EFFECTIVE DATE
DECEMBER 3, 2008

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Oregon State Plane South Zone (FIPS zone 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Josephine County and the State of Oregon. This information was compiled from Josephine County (2008), Oregon Water Resources Department (2006), OR/WA Bureau of Land Management (2000), U.S. Fish and Wildlife Service (2008), Oregon Parks and Recreation Department (2008), and National Geodetic Survey (2007), at a scale of 1:24,000.

The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

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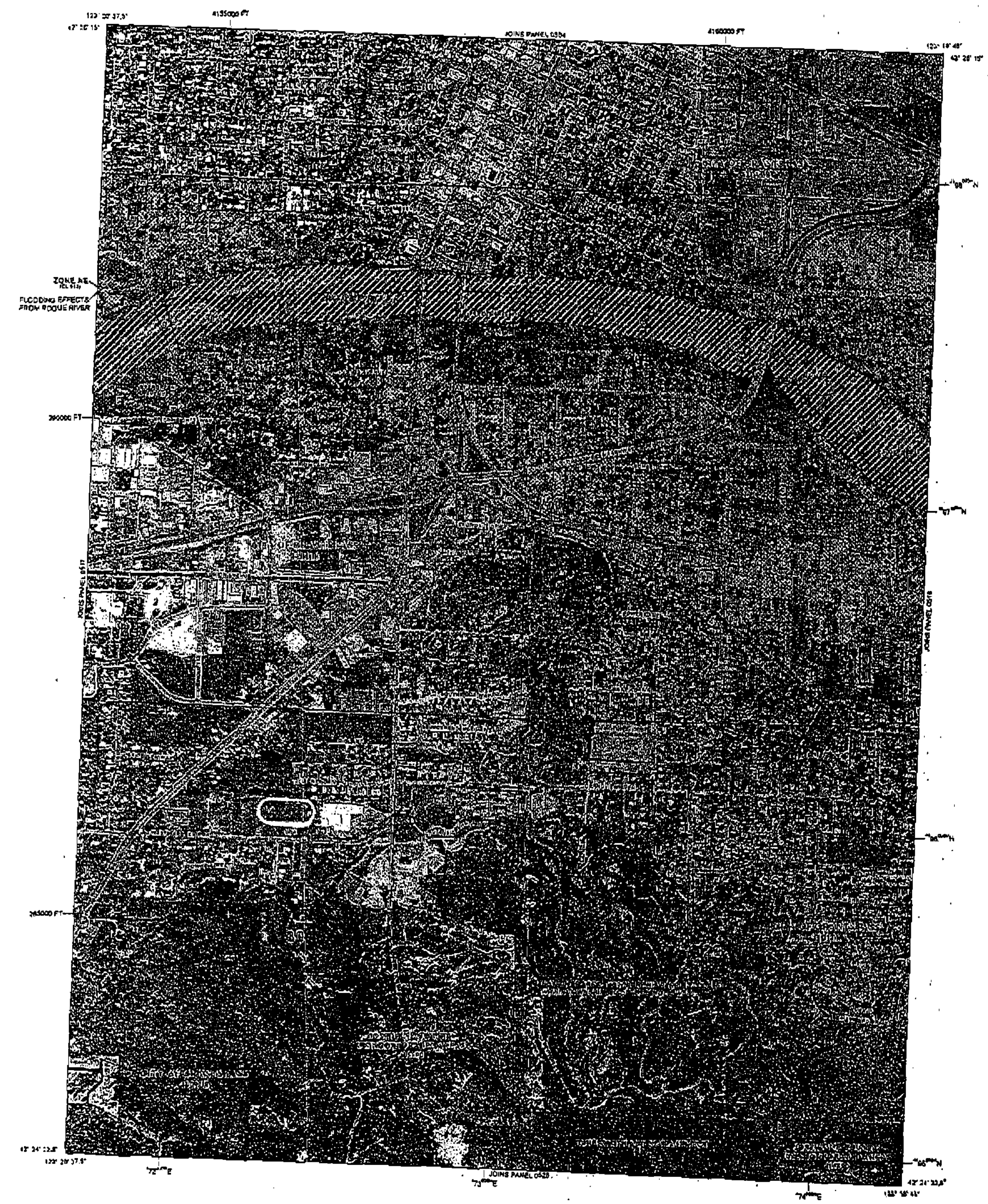
Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 500'

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0512E

FIRM

FLOOD INSURANCE RATE MAP

JOSEPHINE COUNTY, OREGON AND INCORPORATED AREAS

PANEL 512 OF 1175

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
[illegible]	[illegible]	[illegible]	E
JOSEPHINE COUNTY	[illegible]	[illegible]	E

PROOF COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 41033C0512E

EFFECTIVE DATE DECEMBER 3, 2009

Federal Emergency Management Agency

NOTES TO USERS

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Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Oregon State Plane South zone (FIPSZONE 3602). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov.

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The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

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Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

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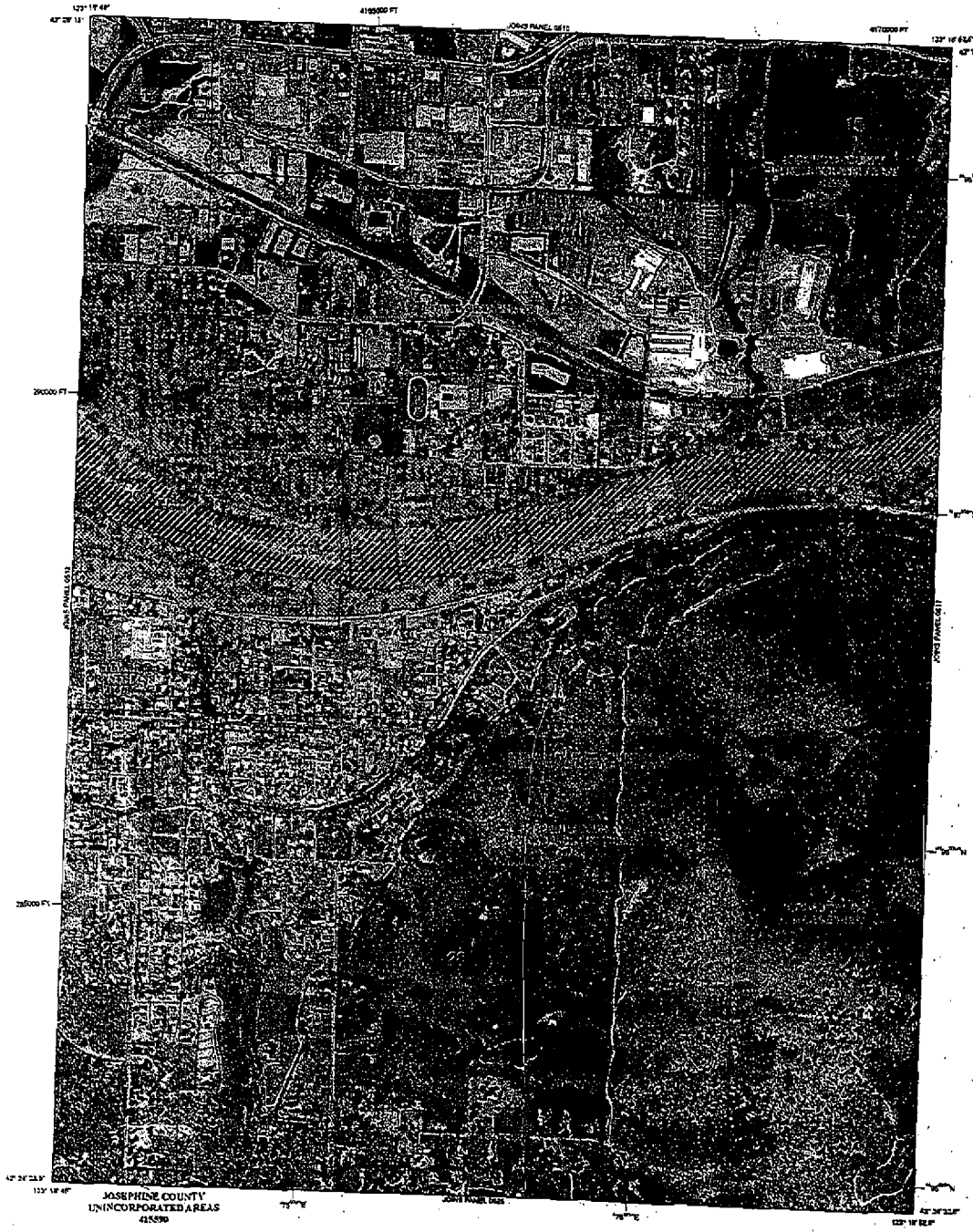


LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A1-A30, AR, V1-V30, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction. No Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway Boundary

Zone D Boundary

CBRS and OPA Boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet*

Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

Cross section line

Transect line

37° 07' 30", 97° 07' 30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4275000 FT — 5000-foot ticks: Oregon State Plane South Zone (FIPSZONE 3602), Lambert Conformal Conic projection

1000-meter Universal Transverse Mercator grid values, zone 10N

5000-foot grid ticks: Oregon State Plane South Zone (FIPSZONE 3602)

Bench mark (see explanation in Profile to Flood Insurance Study Report)

River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
DECEMBER 3, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For communities/maps with multiple revision dates, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

NFIP — NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0512E

FIRM

FLOOD INSURANCE RATE MAP
JOSEPHINE COUNTY,
OREGON
AND INCORPORATED AREAS

PANEL 512 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRANTS PASS, CITY OF	410146	0512	E
JOSEPHINE COUNTY	415591	0512	E

PROOF
COPY

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
41033C0512E
EFFECTIVE DATE
DECEMBER 3, 2009

Federal Emergency Management Agency

Article 13: Special Purpose Districts

13.010 Purpose

The special purpose districts are intended to accommodate development within areas with specific natural, historical, or locational features. The standards herein are intended to mitigate natural hazards, to protect natural or historical features, and/or to mitigate land use conflicts. The special district standards apply in addition to the standards of the underlying zoning district.

[2]13.020 General Provisions

The Special Purpose Districts shall encompass land areas that:

(1) have slopes exceeding 15%.

(2) are located within the boundaries of the 100 year flood plain.

(3) are located in proximity to hospitals and that are appropriate for medical uses.

(4) are recognized as historically significant.

[3]13.025 Special Purpose District Overlay Map. There shall be an overlay map to the Zoning Map that depicts boundaries of the special districts shown herein. These maps are incorporated into this Section by reference. The special purpose district maps may be amended as provided in Article 4 of this Code. The maps are general in nature. The applicant for a development shall verify the grades on lands or portions of lands that are the subject of any specific application.

13.200 Flood Hazard District

13.210 Authorization, Findings of Fact, Purpose, and Objectives

13.211 Authorization.

The State of Oregon has, in the home rule provisions of the Oregon Constitution, Article XI Section 2, and in ORS 221.410, delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry.

13.212 Findings of Fact.

(1) The flood hazard areas of the City are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.

(2) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately flood-proofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

13.213 Purpose. It is the purpose of the Flood Hazard District to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

(1) To protect human life and health;

(2) To minimize expenditure of public money and costly flood control projects;

(3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) To minimize prolonged business interruptions;

(5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;

(6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;

(7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and

(8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

13.214 Methods of Reducing Flood Losses.

In order to accomplish its purposes, this Article includes methods and provisions for:

(1) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;

(2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(3) Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

(4) Controlling filling, grading, dredging, and other development which may increase flood damage;

(5) Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas; and

(6) Coordinating and supplementing the provisions of the state building cod with local land use and development ordinances.

13.220 Definitions

13.221 Interpretation of Terms. Unless specifically defined below, words or phrases used in this article shall be interpreted so as to give them the meaning they have in common usage and to give this article its most reasonable application. In the event of a conflict between the definitions in this Article and Article 30 of this Code, the definitions in this Article shall apply to the provisions of this Article.

12.222 Definitions

(1) Appeal. "Appeal" means a request for a review of any provision of this Article or a request for a variance.

(2) Area of Shallow Flooding. "Area of shallow flooding" means a designated AO or AH zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.

(3) Area of Special Flood Hazard. "Area of special flood hazard" or "special flood hazard area" (SFHA) means the land in the floodplain within a community subject to a one percent or greater chance of flooding in a given year. Designation on maps always includes the letters A or V.

(4) Base Flood. "Base flood" means the flood having a one percent chance of being equaled or exceeded in any given year. Also referred to as the "100-year flood." Designation on maps always includes the letters A or V.

(5) Basement. "Basement" means any area of the building having its floor subgrade (below ground level) on all sides.

(6) Below-Grade Crawl Space. "Below-grade crawl space" means an enclosed area below the base flood elevation in which the interior grade of the crawlspace is lower than the adjacent exterior grade. (An at-grade crawl-space is one in which they interior grade is at or above the elevation of the exterior grade). For below-grade crawlspaces, these regulations specify that the interior grade is not more than two feet below the lowest adjacent exterior grade, and the height, measured from the interior grade of the crawlspace to the top of the crawlspace foundation, does not exceed 4 feet at any point.

(7) Critical Facility. "Critical facility" means a facility for which even a slight chance of flooding might be too great. Critical facilities include, but are not limited to schools, nursing homes, hospitals, police, fire, and emergency response installations, installations which produce, use or store hazardous materials or hazardous waste.

(8) Development. "Development" means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining,

dredging, filling, grading, paving, excavation or drilling operations located within the area of special flood hazard.

(9) Elevated Building. "Elevated building" means for insurance purposes, a non-basement building which has its lowest elevated floor raised above ground level by foundations walls, shear walls, post, piers, pilings, or columns.

(10) Essential Facility. "Essential facility" has the meaning as defined in the State Building Code.

(11) Existing Manufactured Home Park or Manufactured Home Subdivision. "Existing manufactured home park or manufactured home subdivision" means a manufactured home park or manufactured home subdivision for which the construction of facilities for servicing the lots (in a subdivision) or spaces (in a park) on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the adopted floodplain management regulations.

(12) Expansion to an Existing Manufactured Home Park or Manufactured Home Subdivision. "Expansion to an existing manufactured home park or manufactured home subdivision" means the preparation of additional sites by the construction of facilities for servicing the lots or spaces on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

(13) Flood or Flooding. "Flood" or "flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

(a) The overflow of inland or tidal waters; and/or
(b) The unusual and rapid accumulation of runoff of surface waters from any source.

(14) Flood Insurance Rate Map (FIRM). "Flood Insurance Rate Map (FIRM)" means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

(15) Flood Insurance Study. "Flood Insurance Study" means the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood

Boundary-Floodway Map, and the water surface elevation of the base flood.

(16) Floodway. "Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

(17) Lowest Floor. "Lowest floor" means the lowest floor of the lowest enclosed areas (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered the building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance (provisions for fully enclosed areas below the lowest floor in Section 13.261(2) and for crawlspaces in Section 13.265).

(18) Manufactured Home. "Manufactured home" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

(19) Manufactured Home Park or Manufactured Home Subdivision. "Manufactured Home Park or Manufactured Home Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots or spaces for rent or sale.

(20) New Construction. "New construction" means structures for which the "start of construction" commenced on or after the effective date of adopted floodplain management regulations.

(21) New Manufactured Home Park or Manufactured Home Subdivision. "New manufactured home park or manufactured home subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots or spaces on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of adopted floodplain management regulations.

(22) Recreational Vehicle. "Recreational vehicle" means a vehicle which is:

(a) Built on a single chassis;
(b) 400 square feet or less when measured at the largest horizontal projection;
(c) Designed to be self-propelled or permanently towable by a light duty truck; and
(d) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

(23) Start of Construction. "Start of construction" includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement, or other improvement was within 180 days of the permit date..

The actual start means either the first placement of permanent construction of a structure on a sit, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation.

Permanent construction does not include land preparation, such as clearing grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms,; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

(24) State Building Code. "State Building Code" means the combined specialty codes.

(25) Structure. "Structure" means a walled and roofed building including a gas or liquid storage tank that is principally above ground.

(26) Substantial Damage. "Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

(27) Substantial improvement. "Substantial improvement" means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either:

(a) Before the improvement or repair is started; or

(b) If the structure has been damaged and is being restored, before the damage occurred.

For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

(a) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or

(b) Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

(28) Variance. "Variance" means a grant of relief from the requirements of this Article which permits construction in a manner that would otherwise be prohibited by this Article.

(29) Water Dependent. "Water dependent" means a structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

13.230 General Provisions

13.231 Lands to Which This Article Applies. The provisions of this article shall apply to all areas of special flood hazards within the jurisdiction of the City of Grants Pass, including any areas managed under Intergovernmental Agreement in accordance with the authority provided in Oregon Revised Statute Chapter 190.

13.232 Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard identified by the Flood Insurance Administration in a scientific and engineering

report entitled "Flood Insurance Study, Josephine County and Incorporated Areas," dated December 3, 2009, with accompanying Flood Insurance Maps, and any revision, are hereby adopted by reference and declared to be part of this Code. The best available information for flood hazard area identification as outlined in Section 13.245(2) shall be the basis for regulation until a new FIRM is issued which incorporates the data utilized under Section 13.245(2).

The areas of special flood hazard shall be depicted on the Special Purpose District overlay maps of this Code. The Flood Insurance Study and Flood Maps are on file at the Department of Community Development, and are available for public review.

13.233 Compliance. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this Article and other applicable regulations, including all applicable requirements of the State Building Code, and all FEMA requirements, including requirements of the FEMA/FIA Technical Bulletins.

Failure to comply with any of the requirements of this Article, including violations of conditions and safeguards established in connection with the conditions, shall constitute a violation. Penalties for violations and noncompliance, and remedies to correct violations and noncompliance, are governed by the provisions of Article 1 of this Code and any and all other provisions of this Code, the Municipal Code, and laws of the City of Grants Pass.

13.234 Abrogation and Greater Restrictions. This Article is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this Article and another ordinance, state building code, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

13.235 Interpretation. In the interpretation and application of this Article, all provisions shall be:

(1) Considered as minimum requirements;

(2) Liberally construed in favor of the governing body; and

(3) Deemed to neither limit nor repeal any other powers granted under state statutes and rules including the state building code.

13.236 Warning and Disclaimer of Liability. The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This article does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This article shall not create liability on the part of the City of Grants Pass, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

13.240 Administration.

13.241 Development Permit Required. A Development Permit shall be obtained before construction or development begins within any area of special flood hazard established in Section 13.232. The permit shall be for all structures including manufactured homes, as set forth in the Definitions section of this Article, and for all development including fill and other activities, also as set forth in the Definitions section of this Article.

13.242 Application and Submittal Requirements for Development Permit.

Application for a development permit shall be made on forms furnished by the Community Development Department and shall include the following. Actions which require a land use approval prior to a development permit shall include the required information as part of the land use application.

(1) Plan drawn to scale showing the nature, location, dimensions and elevations of the area in question;

(2) Existing and proposed structures, manufactured housing pads, fill, storage of materials, drainage facilities, and the location of the foregoing items;

(3) Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures;

(4) Elevation in relation to mean sea level of floodproofing in any structure;

(5) Certification by a registered professional engineer or architect that the floodproofing methods for any non-

residential structure meet the floodproofing criteria in Section 13.262;

(6) Description of the extent to which any watercourse will be altered or relocated as a result of the proposed development;

(7) Existing and proposed roadways;

(8) Area, location and finish elevations of all fill walls and rip-rap;

(9) Location and elevation of stored materials;

(10) Location and elevation of drainage facilities;

(11) Location and elevation of utilities; and

(12) Other plan requirements of this Code as applicable;

13.243 Elevation Certification. All required elevations shall be tied into known bench marks shown on the Flood Insurance Rate Map by a registered professional surveyor. Said surveyor shall attest to the procedure, bench marks used and accuracy of the required elevation over his signature and seal upon the required plan displaying the elevation information.

13.244 Designation of Local Administrator. The Community Development Director is hereby appointed to administer and implement this Article by granting or denying development permit applications in accordance with its provisions.

13.245 Duties and Responsibilities of Director. The duties of the Director shall include, but not be limited to, the following:

(1) Permit Review.

(a) Review all development permits to determine that the permit requirements and conditions of this article have been satisfied.

(b) Review all development permits to determine that all necessary permits have been obtained from those Federal, State or local governmental agencies from which prior approval is required.

(c) Review all development permits to determine if the proposed development is located in the floodway. If

located in the floodway, assure that the encroachment provisions of Section 13.270 are met.

(2) Use of Other Base Flood Data (in A and V Zones). When base flood elevation data has not been provided as required by this article, the applicant shall obtain and the Director shall review and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, in order to administer this article.

(3) Information to be Obtained and Maintained by the Director.

(a) Where base flood elevation data is provided through the Flood Insurance Study, Flood Insurance Rate Maps, or as required in Section (2) above: Obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basements and below-grade crawlspaces) of all new or substantially improved structures, and whether or not the structure contains a basement.

(b) For all new or substantially improved floodproofed structures where base flood elevation data is provided through the Flood Insurance Study, FIRM, or as required in Section (2) above:

(i) Verify and record the actual elevation (in relation to mean sea level); and

(ii) Maintain the floodproofing certifications required in Section 13.242(5).

(c) Maintain the records of all appeal actions and variances, and report any appeal actions or variances to the Federal Insurance Administration upon request.

(d) Maintain for public inspection all records pertaining to the provisions of this ordinance.

(4) Alteration of Watercourses.

(a) Notify adjacent communities, the Oregon Department of Land Conservation and Development (the State's NFIP Coordinating Agency), the Oregon Water Resources Department, and any other appropriate state and federal agencies, prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.

(b) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

(5) Interpretation of FIRM Boundaries. Make interpretations and determinations where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). If the location of a boundary is contested, the person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation or determination as provided in this article. Such appeals shall be reviewed consistent with the standards of this code and Section 60.6 of the Rules and Regulations of the National Flood Insurance Program (44 CFR 59-76).

(6) Location of FIRM Boundaries and Elevations.

(a) Make all information relating to the 100-year flood plain and floodway location and elevations available to the applicant, including the Flood Insurance Study with flood sections, the Flood Insurance Rate Maps showing flood elevations and elevation data reference points, and other floodplain development surveys in the immediate vicinity.

(b) Certify that the location of the floodway and 100-year flood plain, and existing and proposed elevations, have been made for the applicant by a professional land surveyor registered in Oregon, and that the signature and seal are affixed certifying the accuracy of such determination.

(c) Certify that the finished floor elevations, and other finished elevations of the proposal affecting the floodway or 100-year flood plain have been constructed or developed to the approved elevations, as certified by a registered professional surveyor over his signature and seal.

(d) Upon request, provide the information in this Section to the applicant, applicant's lender and/or insurance agent.

(e) Should an applicant pursue a change in floodplain or floodway designation from the Federal Emergency Management Agency, assist the applicant with information about the process.

13.246 Variances. Variances to the provisions of this Article shall be processed in accordance with the procedures of Article 2 and the provisions of Article 6 of this Code. Any variance to the Flood Hazard provisions of this Article shall include a recommendation of the City Engineer as specified in Section 6.060(B)(11) and shall address the additional provisions of this Section, except as provided in Subsection (3) of this Section.

(1) Factors to Consider. The review body shall consider all technical evaluations, all relevant factors, and standards specified in this Article, and the following:

(a) The danger that materials may be swept onto other lands to the injury of others;
(b) The danger to life and property due to flooding or erosion damage;
(c) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner and occupants;
(d) The importance of the services provided by the proposed facility to the community;
(e) The necessity to the facility of a waterfront location, where applicable;
(f) The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
(g) The compatibility of the proposed use with existing and anticipated development;
(h) The relationship of the proposed use to the comprehensive plan and floodplain management program;
(i) The safety of access to the property in times of flood for ordinary and emergency vehicles;
(j) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and
(k) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

(2) Additional Guidelines and Requirements for Variances to the Provisions of this Article. In addition to the variance criteria in Article 6, the review body shall address the provisions of this Section.

(a) Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be

erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing the items in Subsection (1) of this Section have been fully considered. As the lot size increases, the technical justification required for issuing the variance increases.

(b) Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.

(c) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(d) Variances to the provisions of this Article shall only be issued upon findings of:
(i) A showing of good and sufficient cause;
(ii) A determination that failure to grant the variance would result in exceptional hardship to the applicant;
(iii) A determination that the granting of the variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense; create nuisances; cause fraud on or victimization of the public in consideration of the factors of Subsection (1) of this Section; or conflict with existing local laws or ordinances.

(e) Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece of property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.

(f) Variances may be issued for non-residential buildings in very limited circumstances to allow a lesser degree of flood-proofing than watertight or dry-proofing, where it can be determined that such action will have low damage potential, comply with all other provisions of this Subsection other than (a), and otherwise comply with the provisions of Section 13.252 (Anchoring) and 13.253 (AH Zone Drainage).

(3) Exceptions for Historic Properties. Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the Statewide Inventory of Historic Properties in accordance with Article 6, without regard to the additional provisions of Subsections (1) and (2) of this Section. In such case, the variance shall be part of the review and approval by the Historic Buildings and Sites Commission required in Article 13.400 of this Code. In addition:

(a) Such variances shall be only the minimum deviation from NFIP criteria that is necessary to assure that the historic character and design is not destroyed; and

(b) The variance must not preclude the continued designation of the structure as an historic structure.

Any measures that can be taken to reduce future flood damage consistent with this Subsection shall be required, such as elevating an air conditioner or using flood-resistant materials.

(4) Conditions Attached to Variances. Upon consideration of the factors in Subsection (1) and the purposes of this Code and Article, if a variance is granted, the review body may attach conditions to the variance as it deems necessary to further the purposes of this Code.

(5) Notification of Effect on Flood Insurance Rates. Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation.

(6) Record-Keeping. The Director shall maintain the records of all variances and shall report any variances to the Federal Insurance Administration upon request.

13.247 Appeals. Appeals to interpretations of the provisions of this Article or determinations regarding the application of the provisions of this Article shall be undertaken in as provided in Article 10 of this Code. The Director shall maintain the records of all appeal actions and shall report any appeal actions to the Federal Insurance Administration upon request.

13.250 Provisions for Flood Hazard Reduction.

13.251 General Standards. In all areas of special flood hazards, the standards set forth in this Article are required.

13.252 Anchoring.

(1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.

(2) All manufactured homes shall likewise be anchored to prevent flotation, collapse or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques).

13.253 AH Zone Drainage. Adequate drainage paths are required on slopes to guide floodwaters around and away from proposed structures.

13.254 Construction Materials and Methods.

(1) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

(2) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

(3) Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

13.255 Utilities and Services.

(1) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system;

(2) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters;

(3) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding consistent with the requirements of the Oregon Department of Environmental Quality;

13.256 Subdivision and Development Proposals, Partitions, and Planned Unit Developments.

No proposed subdivision or partition of land or planned unit development plan, or other development located within an area of special flood hazard shall be approved without meeting the requirements of this article. All of the applicable mapping and certification requirements of this article shall be met at the Tentative Map, Plat or Plan stage of review for subdivisions, partitions, and planned unit developments (See also Article 17, Lots and Creation of Lots, and Article 18, Planned Unit Development.)

(1) All development proposals, including subdivision proposals, shall be consistent with the need to minimize flood damage;

(2) All development proposals, including subdivision proposals, shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage;

(3) All development proposals, including subdivision proposals, shall have adequate drainage provided to reduce exposure to flood damage; and

(4) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for development proposals, including subdivision proposals, which have the potential for 5 dwelling units or more or contain 1 acre or more, whichever is less.

13.257 Review Where Elevation Data Not Available. Where elevation data is not available through the Flood Insurance Study FIRM, or another authoritative source, applications for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate the lowest floor at least two feet above grade in these zones may result in higher insurance rates.

13.260 Specific Standards.

In all areas of special flood hazards where base flood elevation data has been provided (Zones A1-30, AH, and AE) as set forth in Section 13.232 (Basis for Establishing the Areas of Special Flood Hazard) or Section 13.245(2) (Use of Other Base Flood Data), the following provisions are required.

13.261 Residential Construction.

(1) New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to a minimum of one foot above the base flood elevation.

(2) Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

(a) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall provided.

(b) The bottom of all openings shall be no higher than one foot above grade.

(c) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

13.262 Non-Residential Construction.

(1) New construction and substantial improvement of any commercial, industrial or other non-residential structure shall either have the lowest floor, including basement, elevated to a minimum of one foot above the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

(a) Be floodproofed so that the structure is watertight with walls substantially impermeable to the passage of water to a level of one foot above the base flood elevation;

(b) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

(c) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this section based on their development and/or review of the structural design, specifications and plans. Such certifications shall also provide that the provisions of 13.254 are satisfied. Such certifications shall be provided to the Director as set forth in Section 13.245(3)(b).

The certification by a registered professional engineer or architect shall specify that the floodproofed methods for any commercial or industrial structure are adequate to withstand the flood depths, pressures, velocities, impacts and uplift forces and other factors associated with the base flood.

(2) Non-residential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in Section 13.261(2).

(3) Applicants floodproofing non-residential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building floodproofed to the base flood level will be rated as one foot below that level).

13.263 Manufactured Homes.

(1) All manufactured homes to be placed or substantially improved on sites listed below shall be elevated on a permanent foundation such that the finished floor of the manufactured home is elevated to a minimum of 18 inches (46 cm) above the base flood elevation and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement:

(*NOTE*: See 2002 Oregon Manufactured Dwelling and Parks Specialty Code, Chapter 3 *Manufactured Dwelling Installations* and Chapter 10 *Manufactured Dwelling Park Construction*. That code also includes the following provisions: 3-2.4.1.(b)1 requires that the top of the dwelling stand be at least one foot above base flood elevation unless openings are provided per FEMA Technical Bulletin 1-93. 10-2.2(d) specifies that manufactured dwelling parks or park expansions shall not be permitted

in a flood hazard area unless the stands are elevated above the base flood elevation).

(a) Outside of a manufactured home park or manufactured home subdivision;

(b) In a new manufactured home park or manufactured home subdivision;

(c) In an expansion to an existing manufactured home park or manufactured home subdivision;

(d) In an existing manufactured home park or manufactured home subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood.

(2) Manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or manufactured home subdivision within Zones A1-30, AH, and AE on the community's FIRM that are not subject to the above manufactured home provisions shall be elevated so that either:

(a) The finished floor of the manufactured home is elevated to a minimum of 18 inches (46 cm) above the base flood elevation; or

(b) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement.

13.264 Recreational Vehicles. Any recreational vehicle placed on a site within Zones A1-30, AH, AE shall either:

(1) be on the site for fewer than 180 consecutive days;

(2) be fully licensed and ready for highway use, on its wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, with no permanently attached additions;

(3) meet the requirements of 12.263 above and the elevation and anchoring requirements for manufactured homes; or

(4) be stored within a fully enclosed building that is floodproofed or elevated in accordance with the requirements of Section 13.262.

Nothing in the Section is intended to authorize the use of a recreational vehicle in a manner otherwise prohibited by this Code or other laws.

13.265 Crawlspaces and Below-Grade Crawlspaces. At-grade crawlspaces are the preferred method of crawlspace construction within flood hazard areas. However, below-grade crawlspaces are permitted, and are not considered basements, if all of the following are satisfied. *See Figures 13-1, 13-2 and 13-3.*

Otherwise, below-grade crawlspaces are considered basements and subject to applicable requirements for basements. A basement floor is considered the lowest floor (see definition) and must meet requirements for the lowest floor.

(1) Except as provided in this paragraph, because of hydrodynamic loads, the velocity of floodwaters at the site shall not exceed 5 feet per second where a below-grade crawlspace is used. For velocities in excess of 5 feet per second, other foundation types shall be used, or the design shall be approved and stamped by a qualified registered architect or professional engineer. Other types of foundations are recommended for these areas.

The determination of velocity shall be based on the mean floodway velocity in Table 6 of the Flood Insurance Study for Josephine County and Incorporated Areas with a December 3, 2009 effective date where that information is available.

In areas where the mean floodway velocity may exceed 5 feet per second and flood velocity information is not available, such as for the floodway fringe, flood velocity at the building site shall be determined by an engineer knowledgeable in hydraulics and hydrology who is qualified to determine flood velocities at the building site, unless the Building Official determines flood velocities at the building site do not exceed 5 feet per second based on accepted practices or presumptive determinations in accordance with NFIP standards.

(2) The building must be designed and adequately anchored to resist or eliminate flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Hydrostatic loads and the effects of buoyancy can usually be addressed through the required openings described in Subsection (3) of this Section.

(3) Below-grade crawlspaces (and other crawlspaces designs) are enclosed areas below the base flood elevation (BFE) and, as such, must have openings that equalize hydrostatic pressures by allowing the automatic entry and exit of floodwaters. The bottom of each flood vent opening shall be no more than 1 foot above the lowest adjacent exterior grade.

(4) For all crawlspaces, portions of the building below base flood elevation shall be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawlspace used to elevate the building, but also any joists, insulation, or other materials that are below the base flood elevation. If flood-resistant materials are not used for building elements, those elements shall be elevated above base flood elevation. The recommended construction practice is to elevate the bottom of joists and all insulation at least one foot above base flood elevation. Most types of insulation are not flood-resistant materials.

Flood-resistant materials shall be determined and where used, shall be in accordance with *FEMA Technical Bulletin 2, Flood Damage-Resistant Materials Requirements, August 2008*, or as revised.

(5) Any building utility systems within a crawlspace shall be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions. Ductwork, in particular, must either be placed above the base flood elevation or sealed from floodwaters.

FEMA Bulletin 348, *Protecting Building Utilities from Flood Damage*, provides detailed guidance on designing and constructing flood-resistant utility systems.

(*NOTE*: Section R324.1.5 of the residential Building Code also addresses mechanical and electrical systems. Section 7 and Table 7-1 of ASCE Standard 24-05, *Flood Resistant Design and Construction*, also address utility requirements and may include requirement for elevation higher than base flood elevation for certain situations).

(6) The interior grade of a below-grade crawlspace below the base flood elevation shall not be more than 2 feet below the lowest adjacent exterior grade as shown in Figure 13-3.

(7) The height of a below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall shall not exceed 4 feet at any

point as shown in Figure 13-3. The height limitation is the maximum allowable unsupported wall height according to the engineering analyses and building code requirements for flood hazard areas.

(8) The drainage system shall be designed to remove floodwaters from the interior area of the crawlspace in a maximum time of 72 hours. The type of drainage system will vary because of the site gradient and other drainage characteristics, such as soil types. Options include, but are not limited to, natural drainage through porous, well-drained soils, drainage systems such as perforated pipes, drainage tiles, or gravel or crushed stone drainage by gravity or mechanical means. The drainage system shall be a system approved by the Building Official or shall be designed and stamped by the applicant's engineer.

(NOTE: Buildings that have below-grade crawlspaces will have higher flood insurance premiums than buildings that have the preferred crawlspace construction with the interior elevation at or above the lowest adjacent grade, even when the crawlspace meets the requirements of this section and FEMA Technical Bulletin 11-01. Buildings with below-grade crawlspaces currently cannot be rated by an insurance agent using the NFIP Flood Insurance Manual. They must be submitted for a special rating under the "Submit-to-Rate" process by underwriters knowledgeable in this type of construction).

Figure 13-1. Preferred Crawlspace Construction

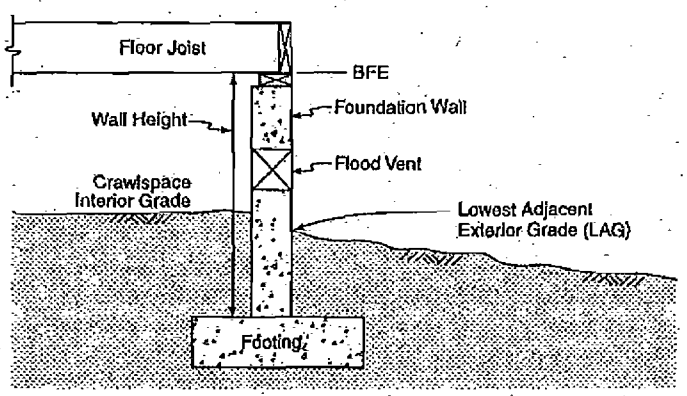


Figure 13-2. Below-Grade Crawlspace Construction

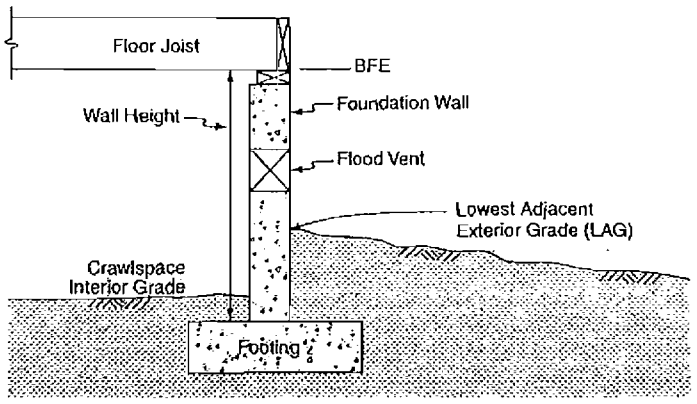
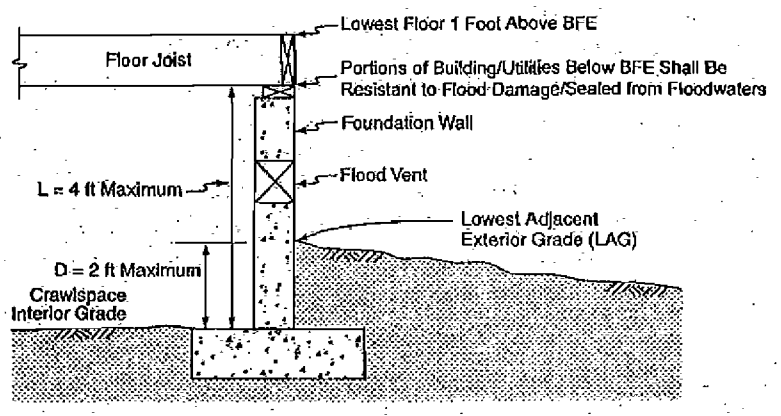


Figure 13-3. Requirements for Below-Grade Crawlspace Construction



13.270 Floodways.

Located within areas of special flood hazard are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the provisions of this Section apply.

13.271 Designated Floodways.

(1) Except as provided in Section (3) below, encroachment, fill, new construction, substantial improvements or other development shall not occur within a floodway designated by Flood Insurance Study or Flood Insurance Rate Maps

unless a tecnnical evaluation is performed and certified by a registered professional civil engineer, and demonstrates through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that encroachments, including any surrounding property modifications or improvements, shall not result in any increase in flood levels during the occurrence of the base flood discharge.

(2) If subsection (1) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of this code.

(3) Projects for stream habitat restoration may be permitted in the floodway provided:

(a) The project qualifies for a Department of the Army, Portland District *Regional General Permit for Stream Habitat Restoration* (NWP-2007-1023); and

(b) A qualified professional (a Registered Professional Engineer; or staff of NRCS; the county, or fisheries, natural resources, or water resources agencies) has provided a feasibility analysis and certification that the project was designed to keep any rise in 100-year flood level as close to zero as practically possible given the goals of the project; and

(c) No structures would be impacted by a potential rise in flood elevation; and

(d) An agreement to monitor the project, correct problems, and ensure that flood carrying capacity remains unchanged is included as part of the local approval.

(4) New installation of manufactured dwellings is prohibited, except as provided in this Section (as regulated by the 2002 Oregon Manufactured Dwelling and Park Specialty Code). Manufactured dwellings may only be located in floodways according to one of the following conditions:

(a) If the manufactured dwelling already exists in the floodway, the placement was permitted at the time of the original installation, and the continued use is not a threat to life, health, property, or the general welfare of the public; or

(b) A new manufactured dwelling is replacing an existing manufactured dwelling whose original placement was permitted at the time of installation and the

replacement home will not be a threat to life, health, property, or the general welfare of the public, and it meets the following criteria:

(i) As required by 44 CFR Chapter 1, Subpart 60.3(d)(3), it must be demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that the manufactured dwelling and any accessory buildings, accessory structures, or any property improvements (encroachments) will not result in any increase in flood levels during the occurrence of the base flood elevation;

(ii) The replacement manufactured dwelling and any accessory buildings or accessory structures (encroachments) shall have the finished floor elevated a minimum of 18 inches (46 cm) above the base flood elevation as identified on the Flood Insurance Rate Map;

(iii) The replacement manufactured dwelling is placed and secured to a foundation support system designed by an Oregon professional engineer or architect and approved by the Community Development Department;

(iv) The replacement manufactured dwelling, its foundation supports, and any accessory buildings, accessory structures, or property improvements (encroachments) do not displace water to the degree that it causes a rise in the water level or diverts water in a manner that causes erosion or damage to other properties;

(v) The location, use, and improvements of a replacement manufactured dwelling complies with all provisions of this Code, other applicable Codes, and any conditions of approval; and

13.272 Floodways Not Designated.

(1) In areas where a regulatory floodway has not been designated in the Flood Insurance Study or on the Flood Insurance Rate Maps, no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the Flood Insurance Rate Map, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated

development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

(2) Development shall not occur on any floodplain lands, where a floodway has not been designated for that reach of a stream or river in the Flood Insurance Study referenced in Section 13.232 of this Code unless:

(a) The Director has evidence which in his judgment would indicate the proposed development site is located in an area of shallow flooding, and the proposed development complies with the provisions of Section 13.280 and will not divert the flood or cause a rise in the level of the discharge above the base flood elevation; or

(b) A technical study is completed which establishes the probable location of the floodway as defined in this Code, and the proposed development complies with the applicable provisions of this Code, whether it is within the floodway or the floodway fringe.

(3) If a technical study is completed under the requirements of this section, demonstrating that the encroachment will not increase the flood levels, any permitted construction or substantial improvements shall comply with all other applicable standards of this Code.

13.280 Standards for Shallow Flooding Areas (AO Zones).

Shallow flooding areas appear on Flood Insurance Rate Maps as AO zones with depth designations. The base flood depths in these ones range from 1 to 3 feet above ground where a clearly defined channel does not exist, or where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is usually characterized as sheet flow. In these areas, the following provisions apply:

(1) Residential Structures. New construction and substantial improvements of residential structures and manufactured homes within AO zones shall have the lowest floor (including basement) elevated above the highest grade adjacent to the building, a minimum of one foot above the depth number specified on the Flood Insurance Rate Map, or at least two feet above the highest grade adjacent to the building if no depth number is specified.

(2) Nonresidential Structures. New construction and substantial improvements of nonresidential structures within AO zones shall either:

(a) Have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, a minimum of one foot above the depth number specified on the Flood Insurance Rate Map, or at least two feet above the highest grade adjacent to the building if no depth number is specified; or

(b) Together with attendant utility and sanitary facilities, be completely floodproofed to a minimum of one foot above the depth number specified on the Flood Insurance Rate Map, or at least two feet above the highest grade adjacent to the building if no depth number is specified, so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect as in Section 13.262.

13.290 Critical Facilities and Essential Facilities

13.291 Critical Facilities.

(1) It is recommended that construction of new critical facilities is, to the extent possible, located outside the limits of the Special Flood Hazard Area (SFHA) also known as the 100-year floodplain.

(2) It is recommended that construction of new critical facilities occur within the SFHA only if no feasible alternative site is available.

(3) The following are recommended when Critical Facilities are constructed within the SFHA. Recommendations in this Section do not affect other mandatory provisions of this Code or other applicable codes.

(a) It is recommended that Critical Facilities constructed within the SFHA have the lowest floor elevated a minimum of three feet or to the height of the of the 500-year flood, whichever is higher.

(b) It is recommended that access to and from the critical facility should also be protected to the height utilized above. When those heights are not feasible, it is at least recommended that access routes be elevated to or above the level of the base

flood elevation to all critical facilities to the extent possible.

(4) Floodproofing and sealing measures should be taken to ensure that toxic substances will not be displaced by or released into floodwaters.

13.292 Essential Facilities.

(1) Siting and construction of Essential Facilities, as defined in the State Building Code, shall comply with the applicable provisions of the State Building Code, and other documents adopted by reference in the State Building Code, such as the ASCE Standards.

SAFEGUARDS FROM HAZARD AREAS

Geologic Hazard Areas

Since there is no recent record of any geologic activity in the region, it is reasonable to assume that development may proceed without implementing safeguards such as earthquake design or avoidance of location on fault lines.

Slope Hazard Areas

The most effective method for the city and county to minimize the hazards of development on steep slopes is to review the development process. Slopes in the excess of 35% should be considered hazardous areas. Development that is proposed on slopes greater than 35% should be required to have development plans approved by a licensed engineering geologist in order to ensure that soil erosion and earth movement hazards will be minimized. A review of hillside developments on slopes 15% to 35% should be made by an engineer and a soil scientist in order to minimize the hazards to the structure and to reduce the potential for erosion. Supplemental engineering and site design may be required to lessen the degree of risk.

Soil Hazard Areas

In the preceding subsection, the various soils within the UGB area are inventoried according to a set to characteristics that relate the properties of each soil to specific hazards.

Safeguards for each hazard are primarily related to regulations that protect the stability of the soil and the major hazard for most soils. Once significant soil erosion begins in an area, drastic and costly "stop-gap" measures must be implemented to arrest the rate of erosion. Preventive measures for soil stability on erodible soils is often the best approach. Such preventive measures are:

- traps to keep top soil on the site
- leaving natural vegetation in place
- reducing surface water run-off with vegetative planting and keeping natural water retention areas.

Shrink-swell and road building hazards can be safe-guarded with adequate design and site preparation. An important task is to ensure that builders and developers are made aware of the soil properties of the site or area before planning and construction begin. The soil mapping and inventory of this section should serve as adequate generalized information regarding the hazards of soils within the UGB area. Site specific analysis of the soils should be encouraged in sensitive areas where soils are exposed to weathering and/or where slopes are steeper than 35% percent.

The relationship between steep topography, soils and natural vegetation becomes increasingly delicate as the percentage of slope increases. This delicate balance is strongly affected by human actions in developing or preparing sites for development. Extensive excavations for cut and fills, premature removal of natural vegetation and the additional load placed on a hillside by development can lead to earth movement in the form of slope erosion or mass movement.

EXHIBIT 4

5.30 FLOOD HAZARD

PURPOSE

The purpose of this section is to describe the history of flooding in the urban growth boundary area, identify the flood-prone areas, evaluate the degree of hazard, and describe the appropriate safeguards from flooding.

HISTORY OF FLOODING

The earliest recorded flood in Josephine County occurred in 1861. Since no subsequent flood has surpassed the magnitude of that flood, it has been chosen to represent the "100 year flood." (Army Corps of Engineers) Flood magnitudes are rated by their chance of annual occurrence. A "100 year flood" is assumed to have a 1% chance of occurring each year. A "1 year flood" is assumed to have a 100% chance of occurring each year. These are mathematical relationships that ignore the natural variables which affect the weather. Table 5.30.1 depicts the major floods of the Rogue River at Grants Pass during the last 120 years.

TABLE 5.3.1
Major Floods of the Rogue River at Grants Pass

Flood Year	Water Discharge in Cubic Feet Per Second (cfs)
Nov. - Dec., 1861	175,000 cfs ("100 year")
Feb., 1890	160,000 cfs
Feb., 1907	60,500 cfs
Nov., 1909	70,000 cfs
Feb., 1927	138,000 cfs
Dec., 1942	54,400 cfs
Dec., 1945	70,000 cfs
Jan., 1948	59,900 cfs
Oct., 1950	65,400 cfs
Jan., 1953	77,000 cfs
Dec., 1955	135,000 cfs
Dec., 1964	152,000 cfs ("50 year")
Dec., 1972	82,500 cfs
Dec., 1974	96,400 cfs

The table reveals that there is little mathematical order to the occurrence of floods. Floods of similar magnitude can occur within a few years of each other, such as the February 1907 and November 1909 floods and the October 1950 and January 1953 floods. Floods of relatively great magnitude can occur within a decade of each other, such as the December 1955 and December 1964 floods. The long range forecasting of flood occurrences would seem able to predict only that floods will occur at random intervals and at varying magnitudes.

FLOODPRONE AREAS

The Rogue River flows through the approximate center of the Urban Growth Boundary area. There are five confluent creeks that discharge into the Rogue River within the UGB. Map 5.30.3 shows the UGB and the floodprone areas (shaded). **The actual areas of special flood hazard are identified by the Federal Emergency Management Agency in a scientific and engineering report titled "Flood Insurance Study" with the accompanying Flood Insurance Rate Maps for Josephine County and Incorporated areas effective date December 3, 2009, and any revision**. These areas were subject to flooding during the 1964 flood. Note that flood levels protruded into the channels of Gilbert and Allen Creeks. This phenomenon occurs because the flood level of the river is at a high elevation and the flood waters of the creeks are effectively "dammed" by river water. Water always seeks mean sea level and, therefore, is always flowing to the ocean. When the creeks are dammed by the river, then they overflow their banks upstream and water flows in sheets over the surface of the land in its relentless search for sea level. Therefore, the confluent creeks of the UGB area are also prone to a flood hazard relative to the magnitude of the river flooding.

DEGREE OF FLOOD HAZARD

The degree of flood hazard is measured in terms of loss of life and property. No deaths from flooding in the Grants Pass area are noted in the literature. Flood warnings usually occur in time to prevent loss of life, as people are able to move out of the floodprone areas. However, real property and improvements such as buildings are subject to the forces of flooding water. A quote from the Postflood Report, December 1964 Flood (Army Corps of Engineers) can dramatically relate the damages to property by flooding.

"One of the major factors causing excessive damages during this flood was the enormous quantity of debris brought into the channel from every source. This debris collected behind bridges resulting in the complete destruction of several, and major damage to nearly ever other bridge across the main stream. It also contributed to residential damage all along the river, knocking buildings from their foundations or smashing into walls."

Within the UGB area, residential areas on both sides of the river were flooded up to 8 feet. (Postflood Report, 1964. Army Corps of Engineers). The city sewage treatment plant sustained damages estimated at about $65,000. The Postflood Report did not summarize the value of residential damage but did state the values of the home flooded to be between $30,000 and $50,000 per home and estimated the average residential damage to be $900 per residence. Exhibit 5.30.2 shows an aerial view of the flooding of 1964.

EXHIBIT 5.30.2
Aerial View of 1964 Flood

SAFEGUARDS FROM FLOODING

Safeguards from flooding that can be implemented at the local level are warning systems, land use regulations and the Federal Flood Insurance Program.

Warning Systems

The Army Corps of Engineers operates a computer simulation model for the hydrological characteristics of all the significant water drainage basins in Oregon. That simulation model can predict fairly accurately when a flooding river system will "crest", or reach its highest flooding elevation, and what the elevation will be at the "crest." That information is provided to all radio stations and local emergency units like the police and national guard. If elevations of floodprone areas are known by recognized landmarks, then people and mobile property can be removed from the anticipated flooding area. An emergency evacuation program that employs local police, fire department and other civic groups can help facilitate the relocation of persons and property from a floodprone area.

Land Use Regulations

The City and/or County can regulate the use of land within known floodprone areas. The regulations can range from allowing no development in floodprone areas to allowing any type of development in conjunction with federal floodplain laws. The regulations can also selectively designate floodprone areas as public open space for parks, wildlife areas and floodways. Public open spaces would allow active public use of the land and enhance the attractiveness and livability of the Urban Growth Boundary Area, while reducing future potential losses of life and property from flooding.

Land use regulations can also be used to set aside land areas for the detention of storm water. Those lands, such as wetlands, grassed waterways, and woodlands, may reduce flood elevations of the frequent small floods, and prevent future increases in flood heights of these frequent floods.

Flood heights have the potential for increase in proportion to the increases in urban level development in the Boundary area. Urban development increases the amount of storm water runoff by increasing the area of impervious surfaces such as streets, driveways, parking lots, and rooftops. If the natural storm water detention areas of the UGB area are converted to impervious surfaces by urban development, then the storm water runoff will flow more rapidly over the surface, into stormdrains and on to the creeks and the river, thereby increasing the elevation of the flood and/or decreasing the elapsed time between the beginning of the flood and the flood "crest".

Land use regulations can provide equitable transfers of land use intensities for each land use type from the floodprone areas and storm water detention areas to other less sensitive areas.

For example, a proposed residential development in an area with potential for storm water detention may be encouraged to preserve the detention area through incentives encouraging the transfer of density. The potential number of dwelling units that can be built on the detention area may be transferred to the remaining buildable area of the land that has less potential for detention. In this way, the developer retains the revenue potential of the development, and may even reduce the costs

of development by clustering. The community retains an open space and a storm water detention area, reducing the hazard of flood, and reducing the size and cost of storm drain lines.

Federal Flood Insurance Program

The catastrophic nature of flooding and the relatively localized effect of intermittent floods caused the insurance industry to find it financially unfeasible to provide flood insurance at reasonable rates. Increasingly, the federal government was requested to act to protect and safeguard private property. Legislation was passed in 1956, but money was never appropriated to implement the program. Further studies resulted in Title XIII, National Flood Insurance, part of the Housing and Urban Development Act of 1968 (Public Law 90-448) and the Flood Disaster Protection Act of 1973. Together these acts created an enormous federal subsidy in an effort to provide reasonable flood insurance at affordable rates. In effect, the federal government underwrites private insurance companies and subsidizes insurance premiums by paying the difference between the "affordable" premium which is charged to the policyholder, and the actuarial or "true cost" premium. The actuarial premium would be the rate charged to the policy holder if the insurance policy were written based on the statistical likelihood of flooding combined with the potential losses resulting from flood damage. In exchange for the reduced rate, property owners, through state and local governments, agree to adopt appropriate land use control measures to bring the risk of public and private losses to acceptable levels.

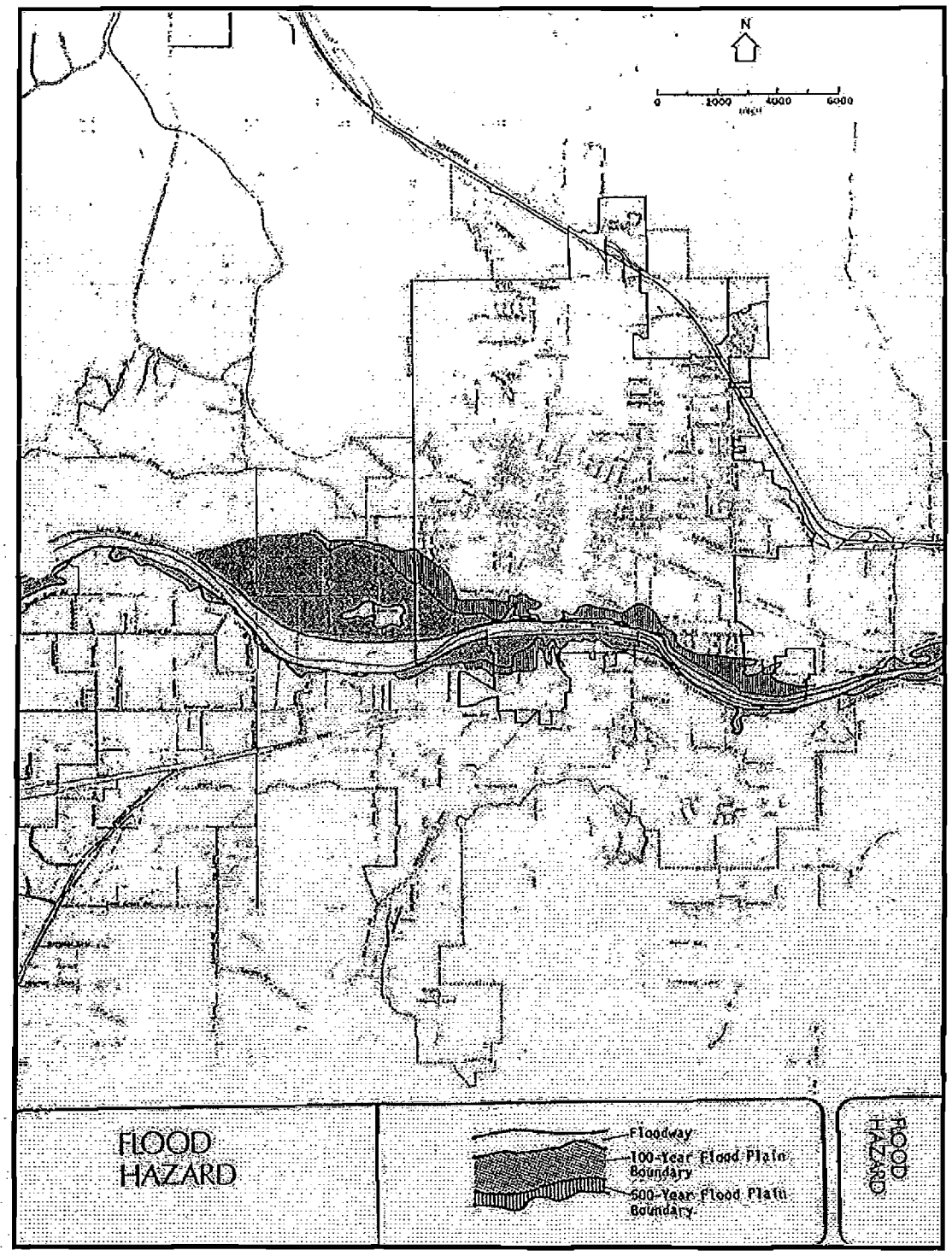
In 1979, work was completed on the Flood Insurance Study for the City of Grants Pass. A similar study was completed for Josephine County in 1980. Initial use of this information will be to convert Grants Pass and Josephine County to the regular flood insurance program of the Federal Insurance Administration. Streams in the area requiring detailed study were identified at informal meetings held in January 1978, between the U.S. Geological survey, the Federal Insurance Administration and the City of Grants Pass. The Rogue River and Gilbert Creek were studied by detailed methods. Although the Gilbert Creek flood plain is quite small, the density and intensity of streamside development justified establishing the flood zones by detailed methods. **Most recently, the Federal Emergency Management Agency completed a new Flood Insurance Study for Josephine County and Incorporated Areas dated December 3, 2009.**

A primary purpose of the National Flood Insurance Program is to encourage state and local governments to adopt and enforce land use practices within flood prone areas to the degree necessary to reduce the risk to acceptable levels as set forth in the program. Each Flood Insurance Study therefore includes a map which delineates the extent and location of areas subject to periodic inundation and differentiates between the floodway and 100-year and the 500-year flood boundaries. In order to provide a national standard without regional discrepancies, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for flood management and insurance purposes. The 500-year flood is indicated simply to make communities aware of additional areas in the community with perceivable levels of flood risk. Map 5.30.3 illustrates the approximate location of the floodway, the 100-year and 500-year flood boundaries. **The actual areas of special flood hazard are identified by the Federal Emergency Management Agency in a scientific and engineering report titled "Flood Insurance Study" with the accompanying Flood Insurance Rate Maps for Josephine County and Incorporated areas effective date**

December 3, 2009, and any revision.

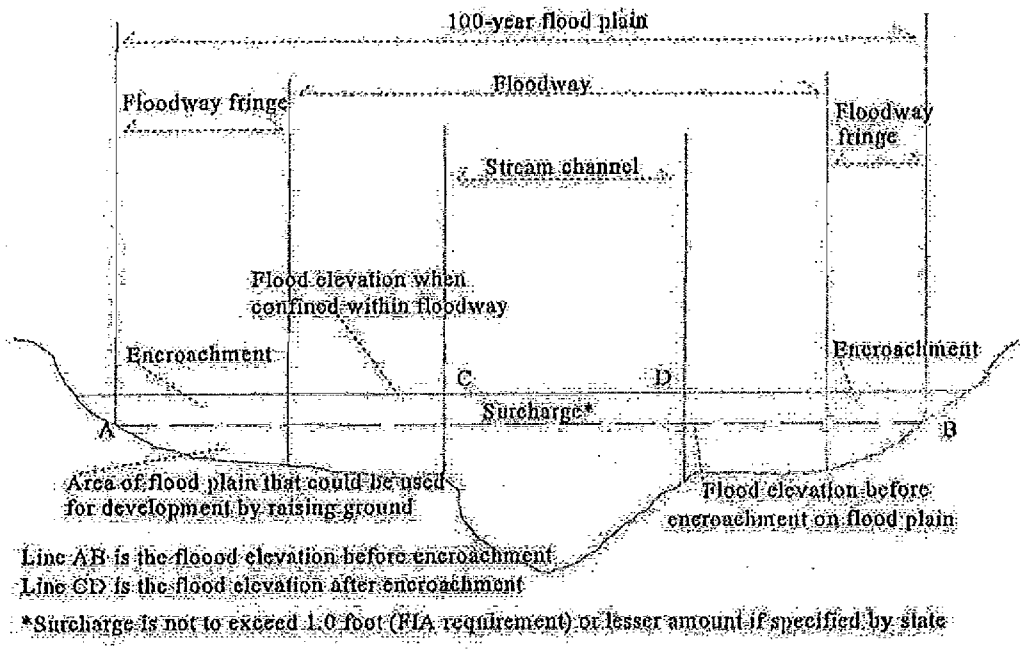
The principal result of the Flood Insurance Study is the Flood Insurance Rate Map. This map contains the official delineation of flood elevation lines. The level of flood risk and therefore insurance premiums are determined from this map.

MAP 5.30.3
Floodway and 100-Year Flood Plain for
Grants Pass Urban Growth Boundary



The National Flood Insurance Program divides the area of the 100-year flood into a floodway and floodway fringe. The floodway is the actual channel of a stream or river plus any adjacent flood plain areas that must be free of encroachment to allow the 100-year flood to flow freely without substantial increases in flood heights. Maximum federal standards establish a limit for flood height increases of one foot, provided that hazardous velocities are not produced. The area between the floodway and the boundary of the 100-year flood are termed the floodway fringe. Exhibit 5.30.4 depicts the relationship among the stream channel, floodway, floodway fringe and 100-year floodplain.

EXHIBIT 5.30.4
Floodway-Flood Plain Schematic



Insurance rates are based on the degree of flood risk. In order to establish actuarial insurance rates, the Federal Insurance Administration has developed a process to transform the data depicted in the floodway schematic drawing, into flood insurance criteria. That process includes the determination of flood hazard factors and flood insurance zone designations for each flooding river or creek.

The city has adopted a floodplain development ordinance that is in compliance with the National Flood Insurance Program. The city ordinance identifies buildable land within the 100-year floodplain as the floodway fringe. The floodway is not considered buildable. Development on the buildable land (floodway fringe) must be constructed so that the first floor level of the building is a minimum of one foot above the 100-year flood elevation. This regulation anticipates that once the floodway fringe is fully encroached upon by development, the actual flood elevation will be raised one foot above the 100-year flood level. Development in the floodway must demonstrate that encroachment will not raise the flood elevation beyond the one foot maximum above the 100-year

flood elevation. The federal regulations require that a qualified surveyor determine the degree of displacement. The displacement of floodway water by the proposed floodway development may adversely affect other development on the adjacent floodway fringe, which usually precludes floodway development in an urban area.

Federal Emergency Management Agency

Washington, D.C. 20472

RECEIVED

JUN 0 9 2009

CITY OF GRANTS PASS

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
19P-N

June 3, 2009

The Honorable Len Holzinger
Mayor, City of Grants Pass
101 NW A Streeet
Grants Pass, Oregon 97526

Community: City of Grants Pass, Oregon
Community No.: 410108
Map Panels Affected: See FIRM Index

Dear Mayor Holzinger:

This is to formally notify you of the final flood hazard determination for your community in compliance with Title 44, Chapter I, Part 67, Code of Federal Regulations. On September 27, 1991, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issued a Flood Insurance Rate Map (FIRM) that identified the Special Flood Hazard Areas (SFHAs) the areas subject to inundation by the base (1-percent-annual-chance) flood in the City of Grants Pass, Josephine County, Oregon. Recently, FEMA completed a re-evaluation of flood hazards in your community. On January 23, 2009, FEMA provided you with Preliminary copies of the Flood Insurance Study (FIS) report and FIRM that identify existing flood hazards in your community.

FEMA has addressed all comments received on the Preliminary copies of the FIS report and FIRM. Accordingly, the FIS report and FIRM for your community will become effective on December 3, 2009. Before the effective date, FEMA will send you final printed copies of the FIS report and FIRM.

Because the FIS for your community has been completed, certain additional requirements must be met under Section 1361 of the National Flood Insurance Act of 1968, as amended, *within 6 months from the* date of this letter. Prior to December 3, 2009, your community is required, as a condition of continued eligibility in the National Flood Insurance Program (NFIP), to adopt or show evidence of adoption of floodplain management regulations that meet the standards of Paragraph 60.3(d) of the NFIP regulations (44 CFR 59, etc.). These standards are the minimum requirements and do not supersede any State or local requirements of a more stringent nature.

It must be emphasized that all the standards specified in Paragraph 60.3(d) of the NFIP regulations must be enacted in a legally enforceable document. This includes adoption of the current effective FIS report and FIRM to which the regulations apply and the other modifications made by this map revision. Some of the standards should already have been enacted by your community in order to establish eligibility in the NFIP. Any additional requirements can be met by taking one of the following actions:

1. Amending existing regulations to incorporate any additional requirements of Paragraph 60.3(d);
2. Adopting all the standards of Paragraph 60.3(d) into one new, comprehensive set of regulations; or
3. Showing evidence that regulations have previously been adopted that meet or exceed the minimum requirements of Paragraph 60.3(d).

EXHIBIT 5

Communities that fail to enact the necessary floodplain management regulations will be suspended from participation in the NFIP and subject to the prohibitions contained in Section 202(a) of the Flood Disaster Protection Act of 1973 as amended.

In addition to your community using the FIS report and FIRM to manage development in the floodplain, FEMA will use the FIS report to establish appropriate flood insurance rates. On the effective date of the revised FIRM, actuarial rates for flood insurance will be charged for all new structures and substantial improvements to existing structures located in the identified SFHAs. These rates may be higher if structures are not built in compliance with the floodplain management standards of the NFIP. The actuarial flood insurance rates increase as the lowest elevations (including basement) of new structures decrease in relation to the Base Flood Elevations established for your community. This is an important consideration for new construction because building at a higher elevation can greatly reduce the cost of flood insurance.

To assist your community in maintaining the FIRM, we have enclosed a Summary of Map Actions to document previous Letter of Map Change (LOMC) actions (i.e., Letters of Map Amendment, Letters of Map Revision) that will be superseded when the revised FIRM panels referenced above become effective. Information on LOMCs is presented in the following four categories: (1) LOMCs for which results have been included on the revised FIRM panels; (2) LOMCs for which results could not be shown on the revised FIRM panels because of scale limitations or because the LOMC issued had determined that the lots or structures involved were outside the SFHA as shown on the FIRM; (3) LOMCs for which results have not been included on the revised FIRM panels because the flood hazard information on which the original determinations were based is being superseded by new flood hazard information; and (4) LOMCs issued for multiple lots or structures where the determination for one or more of the lots or structures cannot be revalidated through an administrative process like the LOMCs in Category 2 above. LOMCs in Category 2 will be revalidated through a single letter that reaffirms the validity of a previously issued LOMC; the letter will be sent to your community shortly before the effective date of the revised FIRM and will become effective 1 day after the revised FIRM becomes effective. For the LOMCs listed in Category 4, we will review the data previously submitted for the LOMA or LOMR request and issue a new determination for the affected properties after the revised FIRM becomes effective.

The FIRM and FIS report for your community have been prepared in our countywide format, which means that flood hazard information for all jurisdictions within Josephine County has been combined into one FIRM and FIS report. When the FIRM and FIS report are printed and distributed, your community will receive only those panels that present flood hazard information for your community. We will provide complete sets of the FIRM panels to county officials, where they will be available for review by your community

The FIRM panels have been computer-generated. Once the FIRM and FIS report are printed and distributed, the digital files containing the flood hazard data for the entire county can be provided to your community for use in a computer mapping system. These files can be used in conjunction with other thematic data for floodplain management purposes, insurance purchase and rating requirements, and many other planning applications. Copies of the digital files or paper copies of the FIRM panels may be obtained by calling our Map Service Center, toll free, at 1-800-358-9616. In addition, your community may be eligible for additional credits under our Community Rating System if you implement your activities using digital mapping files.

If your community is encountering difficulties in enacting the necessary floodplain management measures, we urge you to call the Director, Federal Insurance and Mitigation Division of FEMA in Bothell, Washington, at (425) 487-4682 for assistance. If you have any questions concerning mapping issues in general or the enclosed Summary of Map Actions, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). Additional information and resources your community may find helpful regarding the NFIP and floodplain management, such as *The National Flood Insurance Program Code of Federal Regulations*, *Answers to Questions About the National Flood Insurance Program*, *Frequently Asked Questions Regarding the Effects that Revised Flood Hazards have on Existing Structure*, *Use of Flood Insurance Study (FIS) Data as Available Data*, and *National Flood Insurance Program Elevation Certificate and Instructions*, can be found on our website at http://www.floodmaps.fema.gov/lfd. Paper copies of these documents may also be obtained by calling our Map Assistance Center.

Sincerely,

William R Blanton Jr

William R. Blanton Jr., CFM, Chief
Engineering Management Branch
Mitigation Directorate

Enclosure:
Final Summary of Map Actions

cc: Community Map Repository

Mr. Tom Schauer
Senior Planner, City of Grants Pass

FINAL SUMMARY OF MAP ACTIONS

Community: GRANTS PASS, CITY OF Community No: 410108

To assist your community in maintaining the Flood Insurance Rate Map (FIRM), we have summarized below the previously issued Letter of Map Change (LOMC) actions (i.e., Letters of Map Revision (LOMRs) and Letters of Map Amendment (LOMAs)) that will be affected when the revised FIRM becomes effective on December 3, 2009.

1. LOMCs Incorporated

The modifications effected by the LOMCs listed below will be reflected on the revised FIRM. In addition, these LOMCs will remain in effect until the revised FIRM becomes effective.

LOMC	Case No.	Date Issued	Project Identifier	Old Panel	New Panel
			NO CASES RECORDED		

2. LOMCs Not Incorporated

The modifications effected by the LOMCs listed below will not be reflected on the revised FIRM panels because of scale limitations or because the LOMC issued had determined that the lot(s) or structure(s) involved were outside the Special Flood Hazard Area, as shown on the FIRM. These LOMCs will remain in effect until the revised FIRM becomes effective. These LOMCs will be revalidated free of charge 1 day after the revised FIRM becomes effective through a single revalidation letter that reaffirms the validity of the previous LOMCs.

LOMC	Case No.	Date Issued	Project Identifier	Old Panel	New Panel
LOMA	97-10-389A	10/24/1997	ABERDEEN SUBDIV, BLOCK D, LOT 4– 1714 SW BROWNELL	4101080003C	41033C0511E
LOMA	98-10-086A	02/06/1998	1375 NW PROSPECT AVENUE -- TAX LOT 801, PORTION OF SECTION 7, T36S, R5W, W.M.	4101080002C	41033C0504E
LOMA	00-10-056A	12/15/1999	WESTGATE SUBDIV, BLOCK 1, LOT 5 – 926 COTTONWOOD STREET	4101080003C	41033C0511E
LOMA	02-10-129A	01/09/2002	LOWER RIVER MEADOWS SUBDIV PHASE 2, LOT 68 – 2156 CHAMBERS LANE	4155900237D	41033C0511E
LOMA	03-10-0134A	01/09/2003	GARDEN VALLEY ESTATES SUBDIV, LOT 11 – 2108 GARDEN VALLEY WAY	4155900237D	41033C0511E
LOMA	03-10-0141A	03/13/2003	1436 SE ROGUE DRIVE -- PORTION OF GOVT LOT 4, SECTION 21, T36S, R5W, W.M.	4101080004C	41033C0516E
LOMA	03-10-0430A	05/01/2003	7371 NORTH APPLEGATE ROAD – PORTION OF SECTION 20, T37S, R5W	4155900329B	41033C0702E
LOMA	04-10-0474X	04/14/2004	PARKSIDE ESTATES, LOT 4 – 1126 SW LINCOLN ROAD	4101080003C	41033C0511E

FINAL SUMMARY OF MAP ACTIONS

Community: GRANTS PASS, CITY OF Community No: 410108

LOMC	Case No.	Date Issued	Project Identifier	Old Panel	New Panel
LOMR-F	04-10-0627A	10/13/2004	WEE WILLOW SUBDIV, LOTS 2-3 – 1215 & 1211 IRONWOOD DRIVE	4155900237D	41033C0511E
LOMA	05-10-0849A	11/10/2005	1111 LUZON LANE	4101080004C	41033C0512E
LOMA	08-10-0194A	04/03/2008	EAST PARK SUBDIVISION, BLOCK A, LOT 6 – 1174 ACACIA LANE	4101080004C	41033C0512E
LOMA	08-10-0014A		956 DONEEN LANE – Sec 24, T36S, R6W, W.M.	4155900237D	41033C0511E

3. LOMCs Superseded

The modifications effected by the LOMCs listed below have not been reflected on the Final revised FIRM panels because they are being superseded by new detailed flood hazard information or the information available was not sufficient to make a determination. The reason each is being superseded is noted below. These LOMCs will no longer be in effect when the revised FIRM becomes effective.

LOMC	Case No.	Date Issued	Project Identifier	Reason Determination Will be Superseded
LOMA	02-10-047A	11/28/2001	643/645 BALSAM ROAD – PARTITION PLAT 1996-015, PARCEL 1; LOWER RIVER MEADOWS SUBDIV, LOT 42 – 64	4

1. Insufficient information available to make a determination.
2. Lowest Adjacent Grade and Lowest Finished Floor are below the proposed Base Flood Elevation.
3. Lowest Ground Elevation is below the proposed Base Flood Elevation.
4. Revised hydrologic and hydraulic analyses.
5. Revised topographic information.

4. LOMCs To Be Redetermined

The LOMCs in Category 2 above will be revalidated through a single revalidation letter that reaffirms the validity of the determination in the previously issued LOMC. For LOMCs issued for multiple lots or structures where the determination for one or more of the lots or structures has changed, the LOMC cannot be revalidated through this administrative process. Therefore, we will review the data previously submitted for the LOMC requests listed below and issue a new determination for the affected properties after the effective date of the revised FIRM.

LOMC	Case No.	Date Issued	Project Identifier	Old Panel	New Panel
			NO CASES RECORDED		

URBAN AREA PLANNING COMMISSION
September 23, 2009
6:00 PM
Council Chambers

1. ROLL CALL

The Urban Area Planning Commission met in regular session on the above date with Chair Berlant presiding. Commissioners Arthur, Kellenbeck, Fitzgerald, Richardson, Fowler and Fedosky were present. Also present and representing the City was Interim Community Development Director Angeli Paladino, Senior Planner Schauer, and Associate Planner Glover.

2. ITEMS FROM PUBLIC: None.

3. CONSENT AGENDA

a. MINUTES

i. Minutes of September 9, 2009

Commissioner Kellenbeck stated, I'm abstaining from one of those. Do you want to break it out or do you want me to just vote with the group and abstain from the one?

Chair Berlant stated, why don't we go ahead and break that out. That was the Twisted Pines, so moving the second Findings of Fact Twisted Pines phase 3. Let's deal with all the other matters on the consent agenda.

Commissioner Fitzgerald stated, on page 50 of our packet tonight, in the discourse that we talked about on the text amendment, I found no reference to the question of notification to the Commissioners, yet I asked that question, "Had the Commissioners been notified?" I do find my response about it, but I don't find the question on the record. Interim Community Development Director Angeli Paladino did state that they had been mailed twice, and this doesn't appear in here either. So, I'm wondering why that didn't show up.

Chair Berlant stated, why don't you just make an amendment to it to add that to it and then that will complete it.

Commissioner Fitzgerald stated, actually page 48, where about midway through it says that I stated according to Commissioner Ellis, they have not seen this and didn't know anything about it as of this evening. Well, that's the answer, but the question is missing. So the question was, "Have the Commissioners been notified about this text amendment and Interim Community Development Director Angeli Paladino stated that they had been mailed it twice. The answer there, as I was saying... that change I would like to see put in. Board of County commissioners, yeah.

Commissioner Richardson asked, you did not consider the statement by Commissioner Kellenbeck ahead of that as sufficient? Where she says, "I was wondering if the County Commissioners had at least been noticed that the crosscheck won't happen? Was there addition to that question?

Commissioner Fitzgerald stated, yes there was. I made a specific point as to whether the text amendment had been notified and I asked the question, "Had it been notified to the County Board of Commissioners so that they were aware of what was being taken up."

Commissioner Richardson stated, I understand, but isn't that what the crosscheck included?

Commissioner Fitzgerald stated, no, it wasn't because the text amendment dealt with the residency requirement being changed from the Urban Growth Boundary and so that was what was part of it.

Chair Berlant stated, so, I suggest that if you ask that the minutes be amended to insert the question that you asked then that would cure that.

Commissioner Fitzgerald stated, that's what I'm saying is, it needs to be amended to include the question which was, "Had the Board of County Commissioners been notified of the text amendment changes that were proceeding and

EXHIBIT B
TO UAPC/EDF

characteristics based on the shape of the parent parcel, natural features, including trees. Condition A (2) not applicable, condition A (3) for the reasons stated in subsection (b) which is better achieve the public purpose allowing a lot arrangement that represents a more efficient use of land. Criterion 4, satisfied based on the section that says... based on purpose. It talks about accomplishing the same purpose and so I would relate that back to 3 (b) for the purpose of achieving a better public purpose and design. (She asked another Commissioner off microphone about combining and the conversation was inaudible) I'll combine that with a motion to approve the tentative plan for the subdivision. On item 15, for the shed building on proposed lot 2, to allow that to remain until the time of building permits for that building only but to leave the condition the same for the building that would otherwise split the property line between lots 3 and 4, and to add to that condition on the shop for parcel 2 that the standard code language that we've seen in the past about "if no building permit is pulled, then a demolition permit and removal of that building would be necessary within that given time frame so that there isn't an accessory building with no residence after a certain number of years which I believe is... is it 3 years? Does that sound right? Two or three years? The revision to condition 1 (b) about the CUE being allowed to go directly straight through the hammerhead.

Commissioner Fitzgerald seconded the motion. Chair Berlant asked for further discussion.

Commissioner Fedosky stated, chair Berlant, I agree with you on your recent reflections on needing to have flexibility in these areas but I guess my expectation is that there would be at least one or two of these that jump out as being close to being satisfied. The drawings here for me contrast clearly, the not satisfied nature of these 3, that there are alternatives, and it can be developed, and there's nothing unique in the shape of these lots. It's just a better idea, and the lots will sell better, and a tree is saved. I agree with you but not to the degree that everything in front of us is stretched on so far. I think that begins to deviate from our purpose and our scope as a body. Just my opinion

Commissioner Kellenbeck stated, I have one amendment to my motion and that was to include a condition that require an on-site turnaround for vehicles exiting a garage on parcel 4.

Commissioner Fitzgerald stated, I amend the second.

Chair Berlant asked for further discussion. Seeing none, he called for a vote.

MOTION

Commissioner Kellenbeck moved and Commissioner Fitzgerald seconded a motion as amended and the vote resulted as follows: "AYES": Berlant, Arthur, Kellenbeck, Fowler, and Fitzgerald. "NAYS": Fedosky and Richardson. Abstain: None. The motion carries.

ii. 09-40500004 & 09-40500006: Flood Hazard District – Special Purpose District Map Amendment and Development Code Text Amendment

Proposal:	Special Purpose District Map Amendment and Development Code Text Amendment to adopt the new Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRM) issued by the Federal Emergency Management Agency (FEMA) dated December 3, 2009. The proposal amends Article 13 of the Development Code related to the flood hazard district. In addition, the narrative in Element 5 of the Comprehensive Plan is updated to reflect the new FIS and FIRM maps.
Applicant:	City of Grants Pass
Planner:	Lora Glover

Chair Berlant stated, at this time we will begin the hearing with a Staff report followed by a presentation by the applicant, statements from persons in favor of the applicant, statements by persons in opposition to the application, and an opportunity for additional comments by the applicant and Staff. Once that has occurred, the public comment portion will be closed and the matter will be discussed and acted upon by the Commission.

Chair Berlant asked if there is anyone present who wishes to challenge the authority of the Commission to hear this matter. Seeing none, Chair Berlant asks if there are any Commissioners who wish to abstain from participating in the hearing or declare a conflict or a potential conflict of interest.

[Commissioner Arthur made a comment off microphone. The comments were inaudible]

Chair Berlant stated, I would say that certainly I received notice that my property might be affected by this amendment. In reviewing it, actually, I don't think this amendment has any effect on my property so I don't think there is any either actual or potential conflict for me.

Commissioner Arthur stated, and I have the same thing. I also received a notice and being up on the hill behind here I don't think I'm in any imminent danger of anything.

Are there any Commissioners who wish to disclose discussions, contacts, or other ex parte information they have received prior to this meeting regarding the application. Seeing none, Chair Berlant states that in this hearing the decision of the Commission will be based upon specific criteria which are set forth in the Development Code, all testimony given which apply in this case are noted in the Staff Report. If anyone would like a copy of the Staff Report, please write that in a note to me and one will be provided to you. It is important to remember that if you fail to raise an issue with enough detail to afford the Council and the parties an opportunity to respond to the issue, you will not be able to appeal to the Land Use Board of Appeals (LUBA) based on that issue. Chair Berlant states the hearing will now proceed with a report from Staff.

Associate Planner Glover stated, good evening again. As we start tonight there is a lot of information in the packet and I'll try to guide us through it. We are doing several parts to this. There are various components. We're looking at the Flood Hazard District Zoning Map Amendment, the Special-Purpose District Map Amendment, and the Development Code Text Amendment. This procedure is a type IV. That is a Planning Commission recommendation forwarded to the City Council for their final decision, and that hearing is set for November 4, I believe it is. It will be at six o'clock. Tonight this is a recommendation decision, it is not a final decision for you. The proposal again includes amending the purpose of the Special-Purpose District Map for the flood hazard to adopt the flood insurance study volume 22. Those are referenced throughout the material as the FSI, and the flood insurance rate map, the FIRMs for Josephine County. The amendment also includes adopting a new section 13.200, the flood hazard district as the Development Code, and then also to update Element 5 of the Comprehensive Plan referencing the new FIS and FIRM with an effective date of December 3, 2009. The City of Grants Pass as you know participates in the National Flood Insurance Program. By doing so our residents are able to obtain flood insurance from this program. The Federal Emergency Management Agency which is FEMA has recently completed the process of updating our current 1991 FIS and FIRM maps. The purpose of the new FIS is to revise and update the information on the existence and severity of flood hazards in Josephine County to include the incorporated areas of Cave Junction and the City of Grants Pass. The County is also in the process of adopting the City map, they are not separate maps anymore. So as we go through any expansions later on to the City we will have already adopted those maps. We won't have to go through the process again to pick up small segment along the way. I'll mention this again but, the flood hazard areas are for the Rogue River and also for Gilbert Creek so Commissioner Arthur that's probably why you picked up that notice. It was off of Gilbert Creek.

On June 23, 2009, this was in sense a sudden notice, we've been working through this process but we knew the study was happening, but on June 3, 2009 FEMA mailed their letter of final determination instructing the City that the new maps and study must be adopted to maintain our participation in the flood insurance program by no later than December 3, 2009. Adoption of the FIS and FIRM requires that the Element 5, the Comprehensive Plan, be updated. All of these documents are interrelated. So what one references, we all need to blend it together, and so with the new FIS and FIRMs we need to make sure we're referring to the December 3, 2009 version. In addition, the new FIS requires the update of the Development Code, specifically standards of paragraph 60.3d of the National Flood Insurance Program Regulations. Most of this pertains to the crawl space requirements and how those are constructed.

This is an example. I'm not sure how well the audience can see. On the left is the existing FIRM map showing the light blue as the flood plain and then the floodway in the dark blue. You can see on the new maps there is a difference... we're looking at the Webster-Lincoln road area around the All Sports Park also. The floodway fringe or the floodplain as a lot of folks noticed there is an elevated area in the center that is still clear. It's outside of that hazard, and the floodway stays pretty close to the existing. This is just one example. We are finding a lot of areas where the impacts are less on property owners though there are few areas that they have little bit more of a flood hazard noted on them. I would encourage at this point... I do not have all of the maps available on the computer here, down here at this office, but you are welcome to come into our office and we can print out a map for you of your

specific lot to compare. We do have the large maps here tonight.

Commissioner Richardson stated, the question is I guess, in the old version of the existing flood maps everybody in the blue area and everybody in the pale yellow area was required to have flood insurance in the old map or the existing one, and now in the new one people that used to have to have flood insurance don't need it but these people in floodway fringe are now going to be required to have flood insurance. Is that the basic impact of this?

Associate Planner Glover stated, required... generally it will be coming to their lender. If they have a loan on their property their lender would require it. Part of the difference to is, again we're showing a lot of area in the new map that is now outside of that flood hazard, so based on these maps, the lenders for those home sites would not necessarily require the flood insurance. It also gives an opportunity now for people that may not have been reflected in the flood hazard under the old map that maybe now are reflected in it, they can get the insurance today under today's standards, which those might change if they have to prove elevation later on. So it gives an opportunity for those folks to cut their insurance people.

Commissioner Richardson stated, right. I guess what I'm saying is, at this point people who have mortgages based on this new one, are likely to get a notice from their lender that says, "You're going to have to have and pay for flood insurance." If you own a house in this that you own free and clear, you need to go think about purchasing flood insurance. So we've sent out notices...

Associate Planner Glover stated, we sent out over 1000 notices to people within the flood hazard or Rogue River and Gilbert Creek. But again, even under the existing maps those folks within the flood hazard, their insurance providers more than likely require them to have flood coverage. So it's not having flood coverage is a new requirement, it's just some people may need it now but didn't before or now in this particular map, there's probably quite a few... some of these new subdivisions off of Lincoln area that no longer require it based upon these maps. So the requirement to have flood insurance is not a new requirement.

Commissioner Richardson stated, right, I understand that. Just that in looking at them there is a dramatic difference between those two before and after.

Associate Planner Glover stated, it's much better in this example for most of the people in the middle that are outside of that flood hazard now

Commissioner Richardson interrupted, exactly. It's the folks that are now in the floodway fringe who thought they were secure, who possibly have an issue.

Associate Planner Glover stated, we can overlay these maps in the office and this is what I was trying to show too. It's little bit hard, I keep losing my arrow. As you come up to this area, that's about the same area that's here. This scale is a little bit off. So this floodway fringe has not moved dramatically. Most the time it has reduced down. It's just that it's reduced down here in the center. All of this center is out, where before it was inside. So we're finding that on the majority, the impact is less severe for most properties. But again I would encourage people to come to the office, and we can show them the before and after. I just thought it would be a little bit too much color to lay them on top tonight. I did want to give you a little perspective though. I got these copies of these maps in 1964 courtesy of the County. This is Webster and Lower River Road area. You can see the water and how it inundated the land through that area in and crossed over onto South River road side. This is West Park street. Actually this is East Park street. This is East Park Street running down through here and then West Park Street there. This is Rogue River Highway and then you can see M Street . The next one is my favorite map. This is my mother's house off of Rogue Drive. This is the Portola area, down in the corner . This is Herrick coming down, and then Lela coming through. So we have one of my neighbors here that didn't have water in his house in the 1964 flood.

So the NFIP , the National Insurance Program has been in existence since the passage of the National Flood Insurance Act of 1968. We have over 700 communities in the Pacific Northwest participating in the program. In 1973 flood insurance became mandatory as a condition of any federal or federally related assistant. This generally related to... for the loans. FEMA conducts hydrologic and hydraulic analysis and prepares the flood plain maps and provides those to the participating communities. The combination of insurance and mitigation through floodplain management provides a powerful combination to help safeguard our residents. The plane managing and via ordinances and development standards is a mitigation vice because insurance cannot do the work alone. Participation in the NFIP brings a number of benefits to the community. Residents are able to purchase and renew their flood insurance policy.

The City of Grants Pass participates in the community rating system. It's a voluntary rating system that qualifies our residence for lower flood insurance premiums as a result of education outreach and measures to reduce flood losses. FEMA will also come through and inspect our records and we report to them, I believe on an annual basis of the information we provide. NFIP insurance provides an additional $30,000 from FEMA for reconstruction to meet current standards. This is specifically helpful on older homes that may have built to code originally.

If we are suspended from the program, we face the following consequences: Existing policies will not be renewed. No federal grants or loans for building may be made in identified flood hazard areas. Federally backed mortgages such as Fannie Mae, Freddie Mac, or FHA also require NFIB insurance. So that could limit our housing industry. No federal disaster assistance may be provided to repair any buildings located in the flood hazard areas unless we are participating in the program. In addition, if we are suspended and then go back to get reacted again, there is a 30 day waiting period for flood insurance. This could be critical if we don't respond in time... December 3. It would be into January or February possibly before we would have flood insurance again and that's normally our bad season, our wet season. Non-NFIB insurance companies will not cover more than one claim for disaster. Non-FIP providers are hard or difficult to find and are often very expensive such as Lloyd's of London. They had a very small high risk pool with high premiums. As we go through this with the different amendments we have to address the criteria for us, and this is how the development code for zone map amendments...

Section 4.033 of the development code is specific to zone map amendments. We needed to acknowledge this though we did not feel it was applicable because it's not related to a specific zone, however the adoption of the new FIS and FIRM maps will result in a map change to the flood hazard. A special district. As you are aware we have several Special-Purpose Districts in the Development Code. Again the amendments affect properties along Gilbert Creek and the Rogue River. Section 4.044 of the development code, flood hazard district map; this is satisfied. The flood boundary floodway is established by FEMA. The flood hazard district map may be amended only by FEMA. Upon receipt of authorization from FEMA the Director shall begin administering the flood hazard district as designated by FEMA.

Back again to our directive on June 3, 2009, we received or were mailed their letter of final determination instructing the City to adopt the new FIS and FIRM maps by December 3, 2009. Section 4.103 of the Development Code Proposed Amendment is consistent with the purpose of the section and article. This criteria is determined be satisfied. The proposal amends section 13.200, the flood hazard district, and is consistent with the purpose statement. The amendment will consolidate various flood ordinances in the municipal code and the development code. It will provide additional terms and definitions for the flood hazard, bring construction standards for crawlspaces and below grade crawlspaces into compliance. One of the goals of this amendment will bring the municipal code and various resolutions and ordinances that have been passed over the years will consolidate all of that into the development code so we don't have various documents to research through, or that may have conflicting or outdated language in. So it will all be rolled into this amendment.

The final packet before the City Council will have a draft ordinance available for them noting which documents are going to be updated or canceled at that point. I'm losing the word that I wanted. So, at this point, it's Staff recommendation that you make three motions recommending approval to the City Council. The first is to amend the Special Purpose District Map for the Flood Hazard District by adopting the current insurance study, the FIS volumes 1 and 2, and the Flood Insurance Rate Maps, the FIRMs for Josephine County and incorporated areas effective date December 3, 2009, issued by the Department Homeland Security's Federal Emergency Management Agency (FEMA). The next motion would be the Urban Area Planning Commission recommend that the City Council approve the proposed amendment section 13.200, the flood hazard district of the City of Grants Pass development code to be consistent with the National Flood Insurance Program and the Oregon Model Code Provision. Finally, the third motion be the Urban Area Planning Commission recommend that City Council approve the amendment to update Element 5, the Comprehensive Plan, specifically section flood hazard 5.30, to reference the new FIS and FIRM maps effective December 3, 2009.

I'll jump back up real quick because we didn't really discuss it in the Staff Report, the Oregon Model Code Provisions. This is just kind of the guide that was developed via the department DLCD. It consolidated all the federal and state regulations into kind of a checklist for us to go through to make sure that we had all the parts that we needed to do which is what was rolled into the amendment for article 13. After that I'll open it up to questions for you.

Chair Berlant asked if anyone wanted to speak to this issue. Seeing none he closed the public hearing portion and turned it over to the Commissioners.

Commissioner Richardson stated, when we just talk about Gilbert Creek and the Rogue River obviously we have left out other of the major feeders of the Rogue River. I'm thinking of Sand Creek and Allen Creek and all of the rest of them, and those folks in Atlanta that are seeing this traffic flooding. I know in many places flooding happens someplace else and it can be a perfectly sunshiny day where you are and melting in and around the Crater Lake that can cause flooding to occur here in Grants Pass. Is that the only kind of situation that FEMA deals with or do they deal in just addressing these areas with an idea of a sudden downpour that is so severe that literally the ground cannot handle it?

Interim Community Development Director Angeli-Paladino stated, I don't know that we know that answer.

Associate Planner Glover stated, I do know flood insurance is available to all of us in a sense because flooding happens. It could be an example like that, or an erosion or drainage problem. So the flood insurance program... and if we do this part of it, it still provides the opportunity for all of our residents to achieve flood insurance.

Commissioner Richardson stated, right, I guess though as far as FEMA is concerned, it's to handle a flood event in the rivers as opposed to a.... What is it? Atlanta got, 24 inches of rain in just a matter of 4 or 5 hours -- a tremendous downpour -- so they had flooding in places that they had never had flooding before.

Chair Berlant stated, I'm not sure but I think FEMA covers all of those and this is just trying to look at the most likely areas and more mandate that there'll be coverage or at least protect themselves if they're going to.

Commissioner Fitzgerald stated, this is the concerns of the federal agencies that will require like FHA and all of the programs, Rural Housing programs and others that all fall under FHA guidelines in the secondary market which is Fannie Mae and Freddie Mac, all of them will require these be applied and that's why it really is a perfunctory type of administrative deal. If we don't have... the City does not adopt them, those programs are not available to our citizens. It's just that simple.

Commissioner Fowler asked, and am I to understand that even if you're not living in one of the designated shaded areas you're still eligible for the federal subsidiary or whatever the group insurance is?

Associate Planner Glover stated, yes you can still obtain federal insurance. The studied areas is... when again like a lender would come through and say, "You are in a designated flood area, you have to have it if you want our loan.", but otherwise they obviously recommend a lot of times that people that are concerned or on a smaller tributary should have the flood insurance.

Commissioner Fitzgerald stated, it doesn't change the flood certs that you can obtain from a surveyor which will give you 1 foot... the bottom of the _____ being 1 foot above the flood stage. So anybody that has those flood certs will have to make sure that nothing is changed on the new maps. So I would think it would.... Is there something that we are going to send out as a City? A website or something that alerts people to the fact of having those flood certs perhaps reevaluated to make sure they are okay with the new maps?

Associate Planner Glover stated, well, we will be sending out another notice on this application -- I believe a decision notice with more information there and their contacts information too. Again, we sent out over 1000 notices for all along that hazard area along the Rogue River. We'll be noticing the insurance companies. A lot of them are already aware of it. They're getting their new maps on their own and they have started calling and also on this.

Commissioner Fitzgerald stated, I was just wondering about the flood certifications. A lot of times homeowners don't realize they have them. Especially if they bought a new home that was done by the developer who built the homes, put that in and had all of the crawlspaces flood certified like I did at Schaeffer's. We flood certified every one of those because of it. We should perhaps put something in there to have them contact the person that did that if they have a flood certification to make sure it hasn't changed. It would be a terrible shame if they had a flood certification they thought, and with this new map it's not exactly correct or doesn't work for them just to have them check it. Not that we are trying to inherit some liability but it might be a good idea just to tell them if they had a flood certification that they should have it reestablished or rechecked to make sure it's still effective..

Commissioner Richardson stated, you know it seems to me that the monthly newsletter that comes out with the sewer news would be a wonderful opportunity to remind everybody to have it checked.

Chair Berlant stated, and it looks like you want 3 separate motions on this Associate Planner Glover?

Commissioner Fitzgerald stated, I'll make those motions if you want Commissioner Berlant.

Associate Planner Glover stated, you can do it separately or if you're going to approve all of them then 1, 2, and 3 of those items...

Commissioner Fitzgerald interrupted, do you want them separate Associate Planner Glover? (Associate Planner Glover stated, if you just at least reference those) Do you want me to read a, b and c? (Associate Planner Glover stated, that's fine) I make a motion that we would first recommend that the Urban Area Planning Commission recommend to the City Council to approve the amendment of the Special-Purpose District Map of the flood hazard district by adopting the current flood insurance study FIS volumes 1 and 2, and flood insurance rate maps (FIRM) for Josephine County Oregon and incorporated areas, effective date December 3, 2009 issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA). Do you want me to do all of them? Okay.

B. It is recommended that the Urban Area Planning Commission, I would make a motion that we would recommend the City Council approve the proposed amendment to section 13.200 Flood Hazard District of the City of Grants Pass development code to be consistent with the National Flood Insurance Program (NFIP) and the Oregon Model Code provisions.

C. I make a motion that the Urban Area Planning Commission recommend that the City Council approve the amendment to update Element 5 of the Comprehensive Plan; specifically the section under Flood Hazard 5.30 to reference the new FIS and FIRM effective December 3, 2009.

Chair Berlant called for a vote.

MOTION

Commissioner Fitzgerald moved and Commissioner Richardson seconded the motion to recommend approval for the above noted amendments (A, B, and C) as stated and the vote resulted as follows: "AYES": Berlant, Arthur, Kellenbeck, Fedosky, Fowler, and Richardson. "NAYS": None. Abstain: None. The motion carries.

iii. 09-40500002: Comprehensive Plan Text Amendment
Proposal: Proposed amendment to the Comprehensive Plan adopting a new Urbanization Element
Applicant: City of Grants Pass
Planner: Senior Planner Schauer

Chair Berlant stated, at this time we will begin the hearing with a Staff report followed by a presentation by the applicant, statements from persons in favor of the applicant, statements by persons in opposition to the application, and an opportunity for additional comments by the applicant and Staff. Once that has occurred, the public comment portion will be closed and the matter will be discussed and acted upon by the Commission.

Chair Berlant asked if there is anyone present who wishes to challenge the authority of the Commission to hear this matter. Seeing none; Chair Berlant asks if there are any Commissioners who wish to abstain from participating in the hearing or declare a conflict or a potential conflict of interest. Seeing none, are any Commissioners who wish to disclose discussions, contacts, or other ex parte information they have received prior to this meeting regarding the application. Seeing none, Chair Berlant states that in this hearing the decision of the Commission will be based upon specific criteria which are set forth in the Development Code, all testimony given which apply in this case are noted in the Staff Report. If anyone would like a copy of the Staff Report, please write that in a note to me and one will be provided to you. It is important to remember that if you fail to raise an issue with enough detail to afford the Council and the parties an opportunity to respond to the issue, you will not be able to appeal to the Land Use Board of Appeals (LUBA) based on that issue. Chair Berlant states the hearing will now proceed with a report from Staff.

Senior Planner Schauer stated, I'll talk in a minute on procedural things for this are little bit different so I'll talk about that as part of the presentation in terms of appeals. This is a continuation of the hearing on the Urbanization Element

before the Planning Commission and potentially sooner. The room will probably be a little fuller than the floodplain tonight.

8. ADJOURNMENT

There being no further business to come before the Commission, Chair Berlant adjourned the meeting at 9:30 p.m.

Gary Berlant, Chair
Urban Area Planning Commission

10/14/09
Date

These minutes were prepared by contract minute taker, Wendy Hain

EXHIBIT C

FLOOD HAZARD DISTRICT ZONING MAP AMENDMENT, SPECIAL PURPOSE DISTRICT MAP AMENDMENT, DEVELOPMENT CODE TEXT AMENDMENT

- Applicant: City of Grants Pass
- Project No.: 09-40500004 & 09-40500006
- Procedure: Type IV~ Planning Commission Recommendation and City Council Decision
- Planner: Tom Schauer/Lora Glover

Proposal:

- The proposal includes the following:
  - Amend the Special Purpose District Map for the Flood Hazard District ~ adopt current Flood Insurance Study (FIS) Volume 1 & 2; and Flood Insurance Rate Maps (FIRMs) for Josephine County.
  - Amend Section 13.200 (Flood Hazard District) of the Development Code.
  - Update Element 5 of the Comprehensive Plan (Section 5.30) to reference new FIS and FIRMs effective December 3, 2009.

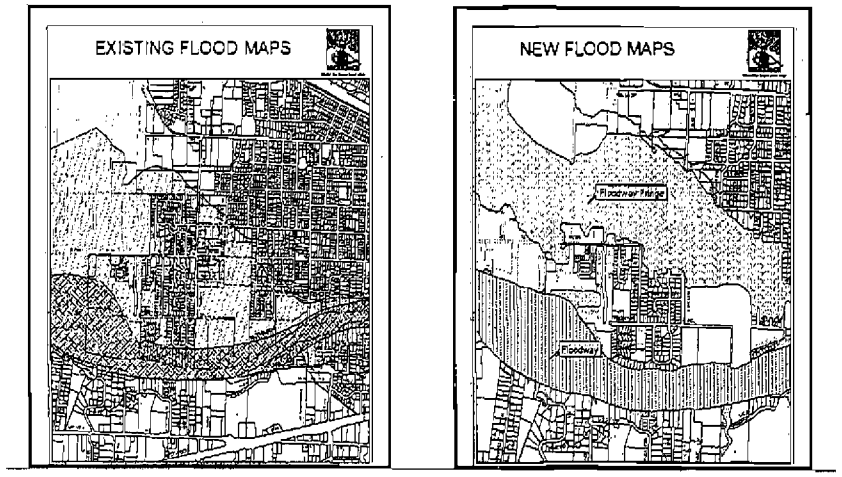
Discussion

- The City of Grants Pass participates in the National Flood Insurance Program (NFIP). By doing so, residents are eligible to obtain flood insurance from the program.
- The Federal Emergency Management Agency (FEMA) has recently completed the process of updating the 1991 FIS/FIRMs.
- The purpose of the new FIS is to revise and update information on the existence and severity of flood hazards in Josephine County (to include the incorporated areas of Cave Junction and Grants Pass).

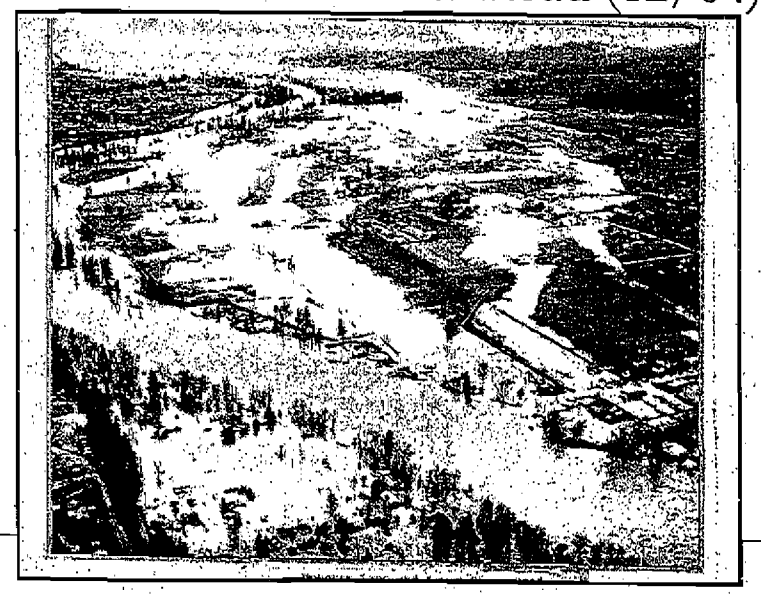
Discussion, cont.

- On June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City that the new maps and study must be adopted to maintain participation in the flood insurance program no later than December 3, 2009.
- Adoption of the new FIS/FIRMs requires that Element 5 of the Comprehensive Plan be updated to reference the new FIS/FIRMs dated 12/3/09.
- In addition, the new FIS requires the update of the Development Code. Specifically, the standards of Paragraph 60.3(d) of the NFIP regulations must be met.

Existing and New Maps
Lincoln Road Area



Webster & Lower River Road (12/64)



East Park Street

Portola Area

NFIP Summary

- The NFIP has been in existence since the passage of the National Flood Insurance Act of 1968.
- There are over 700 communities in the Pacific Northwest participating in the program.
- In 1973, flood insurance became mandatory as a condition of any Federal or Federally-related assistance.
- FEMA conducts hydrologic and hydraulic analyses and prepares the floodplain maps provided to participating communities.

NFIP Summary, cont.

- The combination of insurance and mitigation through floodplain management provides a power combination to help safeguard our residents.
- Floodplain management (via ordinances and development standards) is a mitigation device.
- Insurance alone cannot work.

Participation Benefits/Consequences

- Participation in the NFIP brings a number of benefits to the community:
  - Residents are able to purchase and renew NFIP flood insurance policies.
  - The City of Grants Pass participates in the Community Rating System, a voluntary rating system that qualifies residents for lower flood insurance premiums as a result of education, outreach and measures to reduce flood losses.
  - NFIP insurance provides an additional $30,000 from FEMA for reconstruction to meet current standards.

Participation Benefits/Consequences, cont.

- If we are suspended from the program, we face the following consequences:
  - Existing policies will not be renewed.
  - No Federal grants or loans for buildings may be made in identified flood hazard areas; federally backed mortgages (Fannie Mae, Freddie Mac, FHA) require NFIP insurance.
  - No Federal disaster assistance may be provided to repair buildings in identified flood hazard areas;

Participation Benefits/Consequences, cont.

- There is a 30-day waiting period for flood insurance to become effective.
- Non-NFIP insurance companies will not cover more than one claim (NFIP will).
- Non-NFIP providers are hard to find and are expensive (Lloyd's of London is one example). They have a very small, high-risk pool.

Conformance with Applicable Criteria

- Section 4.033 of the Development Code
  - Zoning Map Amendment ~ Not Applicable. The proposed amendments do not relate to a specific zone. However, the adoption of the new FIS and FIRM maps will result in a map change to the flood hazard (a special purpose district). The amendments affect properties along Gilbert Creek and the Rogue River.

Conformance with Applicable Criteria

- Section 4.044 of the Development Code
  - Flood Hazard District Map ~ Satisfied.
    - Flood Boundary-Floodway Map is established by FEMA;
    - The flood hazard district map may be amended only by FEMA;
    - Upon receipt of proper authorization from FEMA, the Director shall being administering the revised Flood Hazard District, as designated by FEMA.
  - On June 3, 2009, FEMA mailed their "Letter of Final Determination" instructing the City to adopt the new FIS & FIRM maps by 12/3/09.

Conformance with Applicable Criteria

- Section 4.103 of the Development Code
  - The proposed amendment is consistent with the purpose of the subject section and article ~ Satisfied. The proposal amends Section 13.200 "Flood Hazard District" and is consistent with the purpose statement. The amendment will:
    - Consolidate various flood ordinances located in the Municipal Code and the Development Code;
    - Provide additional terms and definitions for the flood hazard;
    - Bring construction standards for crawlspaces and below-grade crawlspaces into compliance.

Staff Recommendation

- Urban Area Planning Commission recommend that City Council **APPROVE** the amendment of the Special Purpose District Map for the Flood Hazard District by adopting the current Flood Insurance Study (FIS) Volumes 1 and 2 and Flood Insurance Rate Maps (FIRM) for Josephine County, Oregon and Incorporated areas effective date December 3, 2009, issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

- Urban Area Planning Commission recommend that City Council **APPROVE** the proposed amendment to Section 13.200 (Flood Hazard District) of the City of Grants Pass Development Code to be consistent with the National Flood Insurance Program (NFIP) and Oregon Model Code Provisions.

- Urban Area Planning Commission recommend that City Council **APPROVE** the amendment to update Element 5 of the Comprehensive Plan, specifically the section under Flood Hazard (5.30) to reference the new FIS and FIRM effective December 3, 2009.

City of Grants Pass Municipal Code

Title 9

LAND DEVELOPMENT AND PUBLIC IMPROVEMENTS

Chapters:

EXHIBIT 2
TO PC STAFF REPORT

To The Planning commision & City Council 10/13/09

This letter is in regards of a hearing the planning commission is having on Nov. 4th 2009 to recomend a change in the guidlines of their Developement code & municipal code provisions. It is to do with code text ammendment section 13.200 flood Hazard District. We preside at 1520 S.W. Brownell ave Grants Pass OR 97526. We have lived here since the home was built in april 1994 and was able to qualify for a low income home thru USDA Rural housing.

My husband and I are both disabled. And our income is only SSD. $309.00 a month from the V.A. for aid and attendance.

If this ordinance changes our property from a 500 yr flood Hazard to a 100 yr flood Hazard. It will be a very adverse effect for us. As the lender can then require we get flood insurance. We cannot afford it & feel we should not be

EXHIBIT 3
To CC Staff Report

forced to buy the Insurance. The fifteen yrs we have lived here we have never even seen the water get to the top of the Banks of the river in our area. We are appealing any change that would cause us a hardship. Please consider this in your consideration

Thankyou, Sandra Hughey
Sandra Hughey

RECEIVED
NOV 03 2009
CITY OF GRANTS PASS

State of Oregon
County of Josephine

On this the 3rd day of November 2009,
Day Month Year

Before me, Karen G. Lawrence, the undersigned Notary Public, personally appeared Sandra Hughey,
Name of Notary Public Name of Signer(s)

☒ personally known to me

☒ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged that he/she/they executed it.

WITNESS my hand and official seal.

Karen G. Lawrence
Signature of Notary Public

OFFICIAL SEAL
KAREN G LAWRENCE
NOTARY PUBLIC - OREGON
COMMISSION NO. 441729
MY COMMISSION EXPIRES SEPTEMBER 18, 2013

11/04/09

To Whom It May Concern:

The new FEMA update places my property fronting the Rogue River in Grants Pass, OR.in a "Special Flood Hazard Area." I have carefully sought out all information possible regarding the dividing of my property for these past ten years of ownership. The prospects of developing a separate river lot has been a reality with my providing water and sewer. As indicated on the map of new FEMA update, the revised flood area now comes up to my roof-line, where before it covered a very small margin. The potential river lot appears to be almost entirely covered by the flood area, with no hope for its future development. Those at the planning dept. tell me, of course, that I will just have to hire an engineer – which would have been necessary in the previous situation, but with resulting possibilities. As I understand it, any new construction on my home is not possible. I have had plans drawn up and waiting to add a much needed guest room, as my home has only one bedroom. Those plans must now be cancelled.

I have consulted an engineer regarding an elevation certificate. I am considerably above the river, and feel compelled to attempt to dispute the FEMA findings, but in so doing is the probable loss of funds required and the long and difficult process in all that's involved in an appeal.

I was born in this area 77 years ago. Only the past ten years were spent on this river, but I know the history of its flooding and of this property. Through two very major floods the water barely rose to just the floor of the basement level. Now with The Lost Creek Dam in place there has not been such flooding.

At the council meeting, September 23rd, in which I did not participate, being unprepared, this agenda of the new FEMA update was presented as a wondrous opportunity for everyone to purchase flood insurance with this national program in place; that would make it more affordable (and a requirement for those involved with loan institutions.) .... more affordable, perhaps, for those who feel the need for flood insurance – I do not!

In the event I must sell my property at some future date, or at such a time when my children should receive their inheritance, the prospect of potential buyers is greatly reduced due to these drastic restrictions, and severely effect my property's value.

Thank you,
Nadine Ham
2215 SE Portola Dr
Grants Pass, OR. 97526

RECEIVED
NOV 04 2009
CITY OF GRANTS PASS

EXHIBIT 4
To CC Staff Report

COMMUNITY DEVELOPMENT
CITY OF GRANTS PASS
101 N.W. "A" ST.
GRANTS PASS, OR 97526

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ATTN: PLAN AMENDMENT SPECIALIST
Department of Land Conservation & Development
635 Capitol Street NE, Suite 150
Salem, OR 97301

PRIORITY