City of Brookings

MEETING AGENDA - AMENDED

CITY COUNCIL/URBAN RENEWAL AGENCY

Monday, Monday June 25, 2018, 7:00pm

City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415

CITY COUNCIL

A. Call to Order

B. Pledge of Allegiance

C. Roll Call

D. Ceremonies

a. Recognition of Gary Milliman

E. Public Hearings/Resolutions

1. USDA-RD Application for Funding [PWDS, Pg. 3]
   a. Resolution 18-R-1146 [Pg. 5]
   b. Notice of Intent to File Application and Notice of Public Hearing [Pg. 6]
   c. Summary of Recommended projects and costs [Pg. 8]
2. Designating Gary Milliman as City Manager Emeritus [City Manager, Pg. 10]
   a. Resolution 18-R-1139 [Pg. 11]
3. Transfer of Appropriations for FY 2017-18 Budget [F&HR, Pg. 12]
   a. Resolution 18-R-1140 [Pg. 14]
   b. Resolution 18-R-1141 [Pg. 15]
   c. Resolution 18-R-1142 [Pg. 17]
   d. Resolution 18-R-1143 [Pg. 18]
   e. Resolution 18-R-1144 [Pg. 19]

F. Oral Requests and Communications from the audience

1. Public Comments on non-agenda items – 5 minute limit per person.*

G. Staff Reports

1. Memorandum of Understanding with Brookings Harbor Garden Club [Parks, Pg. 21]
   a. 2018-19 Memorandum of Understanding with Brookings Harbor Garden Club [Pg. 22]
2. Wild Rogue Relay - 2018 [Parks, Pg. 24]
   a. Fee Wavier and Sponsorship Request [Pg. 25]
3. Adjustment to Non-Represented Employees Compensation Plan [F&HR, Pg. 27]
4. Legislative Priorities [City Manager, Pg. 28]
   a. Correspondence and form from League of Oregon Cities [Pg. 29]
5. Chetco Bar Fire Water Impact Analysis [City Manager, Pg. 47]
   a. GSI Technical Memorandum dated June 8, 2018 [Pg. 50]
   b. Wildfire Source Water Protection Sampling and Analysis Plan [Pg. 68]
   c. Jacobs Engineering Technical Memorandum dated June 5, 2018 [Pg. 207]
6. Intergovernmental Agreement for Building Services [City Manager, Pg. 211]

a. Intergovernmental Agreement [Pg. 212]

H. Consent Calendar

1. Approve Council minutes for June 11, 2018 [Pg. 216]
2. Accept Plan Commission minutes for May 1, 2018 [Pg. 219]
3. Accept TPAC Committee minutes for May 10, 2018 [Pg. 222]
4. Receive monthly financial report for May 2018 [Pg. 223]

I. Remarks from Mayor and Councilors

J. Adjournment

URBAN RENEWAL AGENCY

A. Call to Order

B. Roll Call

C. Accept Agency Minutes for May 29, 2018 [Pg. 229]

D. Public Comments

E. Staff Reports

1. Transfer of Appropriation for FY 2017-18 [F&HR, Pg. 230]
a. Resolution 18-R-1145 [Pg. 231]

F. Agency Remarks

G. Adjournment

*Obtain Public Comment Forms and view the agenda and packet information on-line at www.brookings.or.us, at City Hall and at the local library. Return completed Public Comment Forms to the City Recorder before the start of meeting or during regular business hours.

All public meetings are held in accessible locations. Auxiliary aids will be provided upon request with at least 14 days advance notification. Please contact 469-1102 if you have any questions regarding this notice.

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Signature (submitted by)

Originating Dept: PWDS

City Manager Approval

Subject: USDA-RD Application for funding

Recommended Motion:
Motion to adopt Resolution 18-R-1146, authorizing the City Manager to submit a USDA-RD application to finance the Wastewater Treatment and Sewer Line Improvement project, and authorizing the City Manager to incur $10,949,900 in low interest debt.

Financial Impact:
$10,949,900 in low interest financing debt

Reviewed by Finance & Human Resources Director:

Background/Discussion:
The Wastewater Facilities Plan (WWFP) was completed in February 2016, providing a comprehensive review of the water treatment plant, the wastewater collection system, and lift stations. The WWFP generally describes the condition of the entire sewage system and provides alternative projects with cost estimates that are intended to address portions of the system that are:

- Out of compliance with
  - State Law
  - The National Pollution Discharge Elimination System Permit
  - City Standards
- Worn out and need to be replaced
- Undersized
- Identified as portions experiencing excessive Infiltration and Inflow (I/I)

From the WWFP, a Capital Improvement Plan (CIP) is developed. The CIP identifies the most urgent projects to complete and the estimated cost.

This process is comprehensive; however, projects identified in the CIP are often unfunded. This is the case with the Wastewater CIP. The US Department of Agriculture – Rural Development agency has loan funds available to fund some of the most important and most needed improvements. The interest rates are designed to be as low as possible. To secure the reduced rate funding, it is necessary to submit a detailed application which addresses project parameters and costs, City budgetary health, and the City's utility provisions and fees. The application process also requires a Preliminary Engineering Report (PER) and an Environmental Report

(ER) be prepared, which Council approved as a Dyer Partnership task order on July 10, 2017 and which was completed and will be submitted with the application.

As required by USDA-RD, staff posted a Notice of Intent to File Application on June 13, 018 in the Curry Pilot. Staff made the PER and ER available for public inspection at City Hall, and the documents were also uploaded to the City's electronic document web drawer for online access. The application process further requires the City, within 60 days of application, to provide the public with the opportunity to become acquainted with the proposed project and to comment on any economic or environmental impacts, service area, alternatives or other issues. For this reason, Staff is now requesting the Mayor to open a public hearing to satisfy these requirements.

Subsequent to the public hearing, staff further seeks adoption of Resolution 18-R-1146, authorizing the City Manager to submit the application and incur the debt.

Attachments:

a. Resolution 18-R-1146
b. Notice of Intent to File Application and Notice of Public Hearing
c. Summary of Recommended Projects and cost

CITY OF BROOKINGS
STATE OF OREGON

RESOLUTION 18-R-1146

A RESOLUTION OF THE CITY OF BROOKINGS AUTHORIZING THE CITY MANAGER TO SUBMIT A USDA-RD APPLICATION TO FINANCE THE WASTEWATER TREATMENT AND SEWER LINE IMPROVEMENT PROJECT, AND AUTHORIZING THE CITY MANAGER TO INCUR $10,949,900 IN LOW INTEREST DEBT.

WHEREAS, the Wastewater Facilities Plan (WWFP) has identified needed repairs and improvements of the treatment facilities and sewer lines; and

WHEREAS, low interest financing is available to fund the project through USDA Rural Development; and

WHEREAS, USDA-RD requires documentation authorizing the signor to submit the application on behalf of the City and incur the debt.

NOW THEREFORE BE IT RESOLVED, that the City Council of the City of Brookings, Curry County, Oregon, does hereby authorize the City Manager to submit a USDA-RD application to finance the Wastewater Treatment and Sewer Line Improvement Project; and

BE IT FURTHER RESOLVED, that the City Council of the City of Brookings, Curry County, Oregon, does hereby authorize the City Manager to incur $10,949,900 in low interest debt on behalf of the City.

Passed by the City Council _____, 2018; effective the same date.

Attest:

_____
Mayor Jake Pieper

_____
City Recorder Teri Davis

City of Brookings

898 Elk Drive, Brookings, OR 97415
(541) 469-1102 Fax (541) 469-3650
www.brookings.or.us

Legal
Publish: *June 13, 2018*

NOTICE OF INTENT TO FILE APPLICATION

The ***City of Brookings*** intends to file an application for federal financial assistance with the U. S. Department of Agriculture, Rural Development, Rural Utilities Service. The project includes ***improvements to the sewer system and wastewater treatment plant***.

NOTICE IS HEREBY GIVEN that a public hearing will be held before the City Council on Monday, June 25, 2018, at 7:00 P.M. in the Council Chambers of Brookings City Hall, 898 Elk Drive, Brookings, OR 97415.

The public is invited to attend and participate in this public hearing. All persons wishing to address this matter will have an opportunity to do so in person at the hearing or by submitting written evidence to the Planning Department at the address above. If you wish to speak at the hearing, you will be asked to sign in and afforded 5 minutes to speak.

Any comments regarding this application or any request for public inspection of the application should be submitted to the ***Management Analyst, City of Brookings, (541) 469-1137, tdavis@brookings.or.us***.

All public meetings are held in accessible locations. Auxiliary aids will be provided upon request with advance notification. Please call 469-1137 to make the appropriate arrangements. TTY (800) 735-1232.

991 Public Notices

991 Public Notices

NOTICE OF INTENT TO FILE APPLICATION AND NOTICE OF PUBLIC HEARING

The City of Brookings intends to file an application for federal financial assistance with the U. S. Department of Agriculture, Rural Development, Rural Utilities Service. The project includes improvements to the sewer system and wastewater treatment plant.

NOTICE IS HEREBY GIVEN that a public hearing will be held before the City Council on Monday, June 25, 2018, at 7:00 P.M. in the Council Chambers of Brookings City Hall, 898 Elk Drive, Brookings, OR 97415.

The public is invited to attend and participate in this public hearing. All persons wishing to address this matter will have an opportunity to do so in person at the hearing or by submitting written comment at the address below. If you wish to speak at the hearing, you will be asked to sign in and afforded 5 minutes to speak.

Any written comment regarding this application or any request for public inspection of the application or other associated documents should be submitted to the Management Analyst, City of Brookings, 898 Elk Drive, Brookings, OR 97415, 541-469-1137, tdavis@brookings.or.us.

All public meetings are held in accessible locations. Auxiliary aids will be provided upon request with advance notification. Please call 469-1137 to make the appropriate arrangements. TTY (800) 735-1232

Publish June 13, 2018
No. 71184886

Summary of Recommended Projects

Project No.	Phase No.	Name	Estimated Cost
		New Sewer Improvements	
1	1	Oak, Hemlock, Railroad & Wharf, 18" Sewer (Remaining Piece)	$466,300
2	1	Rowland Lane to Mill Beach Road, 24" Sewer	$1,004,200
3	1	Crissy Circle to Moor Street, 21" Sewer	$501,250
4	1	Mill Beach Road to WWTP. 30" Sewer	$1,128,650
		New Sewer Improvements	**$3,100,400**
		Sewer Main Replacements/Rehabilitation	
5	1	Replace/Rehabilitation of Existing 8-inch Sewer along Moore Street	$302,300
6	1	Replace/Rehabilitation of Existing 8-inch Sewer along Collins Street	$157,000
7	1	Replace/Rehabilitation of Existing 8-inch Sewer along Fir Street	$278,100
8	1	Replace Existing 8-inch Sewer along Oak Street and Pacific Avenue to Pioneer Road	$439,200
9	1	Replace/Rehabilitation of Existing 8-inch Sewer along Spruce Street near Linden Lane	$123,700
10	1	Replace/Rehabilitation of Existing 8-inch Sewer along Spruce Street to Woodland Court	$341,300
11	1	Replace/Rehabilitation of Existing 8-inch Sewer along Del Norte Lane	$229,600
12	1	Replace Existing 10-inch sewer along Highway 101, down Pacific Ave, to Mill Beach Road	$970,700
Total Collection System Sewer Main Repair/Rehabilitation Improvements			**$2,841,900**
		Pump Station Improvements	
1	1	Project No. 1 - Pump Station Improvements	$239,600
2	1	Project No. 2 - Pump Station Improvements	$431,500
3	1	Project No. 3 - Pump Station Improvements	$432,100
		Total Pump Station Improvements	**$1,103,200**
		WWTP Improvements	
1	1	Replace Mechanical Bar Screen, Classifier and Degritter	$667,300
2	1	Trickling Filter Rehabilitation	$692,000
3	1	Blower Building Rehabilitation	$75,700
4	1	Second Clarifier (older), WAS, RAS and Scum Pumps	$289,000
5	1	Second Clarifier (newer), WAS, RAS and Scum Pumps	$289,000
6	1	UV System Replacement	$1,394,900
7	1	Replace Digester Burner	$58,500
Misc.		Vac Truck	$438,000
		Total WWTP Improvements	**$3,904,400**
		Total	**$10,949,900**

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: Resolution 18-R-1139 Designating Gary Milliman as City Manager Emeritus

Recommended Motion:
Motion to adopt Resolution 18-R-1139

Financial Impact:
None. This is an honorary designation.

Reviewed by Finance & Human Resources Director:

Background/Discussion:
This Resolution recognizes retiring City Manager Gary Milliman for his service to the community by conferring the honorary title of City Manager Emeritus (i.e. a person retired from professional life but permitted to retain as an honorary title the rank of the last office held).

This is an honorary title with no compensation or assigned duties.

Milliman will continue to serve as the City's representative to the South West Area Commission on Transportation and the Border Coast Regional Airport Authority as uncompensated community service (other than travel expenses).

Attachment(s):

a. Resolution 18-R-1139

CITY OF BROOKINGS
STATE OF OREGON

RESOLUTION 18-R-1139

A RESOLUTION OF THE CITY OF BROOKINGS CONFERRING THE HONORARY TITLE OF CITY MANAGER EMERITUS UPON GARY MILLIMAN.

WHEREAS, Gary Milliman has served as City Manager for the City of Brookings for a period of 11 years; and

WHEREAS, Gary Milliman has served the community faithfully and well during this period; and

WHEREAS, Gary Milliman is retiring from his employment as City Manager and will continue to serve the City in several volunteer capacities as the City's official representative.

NOW THEREFORE BE IT RESOLVED, that the City Council of the City of Brookings, Curry County, Oregon, does hereby confer the honorary title of "City Manager Emeritus", upon Gary Milliman in recognition of his past and continuing service to the community.

Passed by the City Council _____, 2018; effective the same date.

Attest:

_____
Mayor Jake Pieper

_____
City Recorder Teri Davis

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Signature (submitted by)

Originating Dept: Finance and HR

City Manager Approval

Subject: Transfer of Appropriations for FY 2017-18 Budget

Recommended Motion:

- Adopt Resolution 18-R-1140 approving appropriation transfers for insurance proceeds received in the General Fund and Special Police Fund.
- Adopt Resolution 18-R-1141 accepting specific purpose grants and donations in the General Fund, Capital Projects Reserve Fund, Water SRF Fund, Street SDC Fund, and Special Police Fund.
- Adopt Resolution 18-R-1142 approving appropriation transfers in the General Fund, and Capital Projects Reserve Fund.
- Adopt Resolution 18-R-1143 transferring appropriations from contingency to Judicial, Legislative/Administration, and Parks and Recreation in the General Fund.
- Adopt Resolution 18-R-1144 transferring appropriations from the contingency of the General Fund, Streets Fund, Water Fund, and the Wastewater Fund for workers' compensation costs.

Financial Impact:

There is no net impact to the 2017-18 budget; additional revenues equaled additional expenditures, expenditure increases netted against expenditure decreases.

Background /Discussion:

Oregon local budget law allows municipalities to make transfers of appropriations through a resolution adopted by the governing body, and accept donations and grants, and appropriate through a resolution; accept and appropriate insurance proceeds; appropriate loan proceeds, and transfer up to 15% of fund expenditures from contingency. Appropriation transfers are for the following funds:

General Fund

Transfer $9,533 from contingency for increase workers' compensation costs, detailed by department in the resolution.

Judicial - Transfer $2,000 of appropriations from contingency to Judicial for PERS expenditures.

Legislative/Administration - Transfer $36,000 of appropriations from contingency to Legislative/Administration for legal and contractual expenses.

Parks and Recreation - Transfer $7,500 of appropriations from contingency to the Parks and Recreation for contractual expenditures.

Police - Additional capital expenditures from $240,000 of loan proceeds for new police vehicles.

Fire - Accept insurance proceeds of $3,894 for damage to a fire vehicle.

Non-departmental - Accept grant of $1,618 from City County Insurance Services for public works job analysis. Transfer out of $88,000 to Capital Projects Reserve Fund due to increased franchise revenue.

Streets Fund - Transfer $805 from contingency for increase workers' compensation costs.

Water Fund - Transfer $2,693 from contingency for increase workers' compensation costs, detailed by department in the resolution.

Wastewater Fund – Transfer $5,399 from contingency for increase workers' compensation costs, detailed by department in the resolution.

Capital Projects Reserve Fund - Accept donation of $13,060 from Nature's Coastal Holiday for lighting at Azalea Park. Additional capital expenditures of $88,000 due to transfer in from the General Fund.

Water SRF Fund - Accept grant of $30,000 from Business Oregon for Post Chetco Bar Fire Stabilization and Rehabilitation project.

Street SDC Fund - Accept grant of $1,912,482 from Oregon Department of Transportation for the Railroad Street project.

Special Police Fund - Accept insurance proceeds of $1,407 for the injury of the City K-9. Accept donation of $31,134 from the Estate of Celia Weaver for the Special Police grants/donations program.

Attachments:

Resolution 18-R-1140 Appropriate insurance proceeds
Resolution 18-R-1141 Accept grants and donations and make appropriations
Resolution 18-R-1142 Appropriation transfers
Resolution 18-R-1143 Appropriation transfer from contingency
Resolution 18-R-1144 Appropriation transfer from contingency - workers' compensation

CITY OF BROOKINGS

RESOLUTION 18-R-1140

A RESOLUTION OF THE CITY OF BROOKINGS APPROVING APPROPRIATION TRANSFERS IN THE GENERAL FUND AND SPECIAL POLICE FUND FOR INSURANCE PROCEEDS RECEIVED .

WHEREAS, the City of Brookings ("City") is a municipal corporation which is subject to Oregon Budget Law; and

WHEREAS, ORS 294.450 allows for a transfer of appropriation if authorized by the governing body; and

WHEREAS, the City needs to accept $1,407 of insurance proceeds in the Special Police Fund for the injury to the City K-9, and

WHEREAS, the City needs to accept $3,894 of insurance proceeds in the General Fund for damages to a fire vehicle, and

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Brookings hereby authorizes a transfer of appropriation pursuant to ORS 294.338.

BE IT FURTHER RESOLVED THAT that for the fiscal year beginning July 1, 2017, and for purposes shown below are hereby revised by the City Council as follows:

General Fund

Resources:		
Other Revenue	$	3,894
Requirements:		
Fire	$	3,894

Special Police Fund

Resources:		
Other Revenue	$	1,407
Requirements:		
K-9 Program	$	1,407

Passed by the City Council June 25, 2018, and made effective the same date.

Attest:

Mayor Jake Pieper

City Recorder Teri Davis

CITY OF BROOKINGS

RESOLUTION 18-R-1141

A RESOLUTION OF THE CITY OF BROOKINGS ACCEPTING SPECIFIC PURPOSE GRANTS AND DONATIONS AND APPROPRIATING THOSE FUNDS

WHEREAS, the City of Brookings ("City") is a municipal corporation which is subject to Oregon Budget Law; and

WHEREAS, ORS 294.338 allows the governing body to accept and appropriate specific purpose donations in the year of receipt, and

WHEREAS, the City Council accepts a grant of $1,912,482 from the Oregon Department of Transportation for the Railroad Street project, and

WHEREAS, the City Council accepts a grant of $30,000 from Business Oregon for Post Chetco Bar Fire Stabilization & Rehabilitation Project, and

WHEREAS, the City Council accepts a grant of $1,618 from City County Insurance Services for creating job analysis for public works positions, and

WHEREAS, the City Council accepts a donation of $31,134 from the Estate of Celia Weaver for the Special Police grants/donations program, and

WHEREAS, the City Council accepts a donation of $13,060 from Nature's Coastal Holiday for lighting at Azalea Park, and

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Brookings hereby accepts grants and appropriates funds pursuant to ORS 294.338.

BE IT FURTHER RESOLVED THAT that for the fiscal year beginning July 1, 2017, and for purposes shown below are hereby revised by the City Council as follows:

General Fund

Resources:		
Grants	$	1,618
Requirements:		
Non-departmental	$	1,618

Capital Projects Reserve Fund

Resources:		
Donations	$	13,060
Requirements:		
Parks & Recreation Program	$	13,060

Water SRF Fund

Resources:		
Grants	$	30,000
Requirements:		
Water System Maintenance	$	30,000

Street SDC Fund

Resources:		
Grants	$	1,912,482
Requirements:		
Street Program	$	1,912,482

Special Police Fund

Resources:		
Donations	$	31,134
Requirements:		
Grant/Donation Program	$	31,134

passed by the City Council June 25, 2018, and made effective the same date.

Attest:

Mayor Jake Pieper

City Recorder Teri Davis

CITY OF BROOKINGS

RESOLUTION 18-R-1142

A RESOLUTION OF THE CITY OF BROOKINGS APPROVING APPROPRIATION TRANSFERS IN THE STREETS FUND, CAPITAL PROJECTS RESERVE FUND, AND THE WATER SDC FUND.

WHEREAS, the City of Brookings ("City") is a municipal corporation which is subject to Oregon Budget Law; and

WHEREAS, ORS 294.338(4) allows for a transfer of appropriation if authorized by the governing body; and

WHEREAS, the City received loan proceeds of $240,000 during fiscal year 2017-18, to purchase police vehicles and anticipates that additional capital expenditure, and

WHEREAS, the City anticipates additional franchise revenue of $88,00, to be transferred to the Capital Projects Reserve Fund, and

WHEREAS, the City anticipates the additional transfer into the Capital Projects Reserve Fund from the General Fund of $88,000, and anticipates those additional capital expenditures of $88,000.

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Brookings hereby authorizes a transfer of appropriation pursuant to ORS 294.338(4).

BE IT FURTHER RESOLVED THAT that for the fiscal year beginning July 1, 2017 and for purposes shown below are hereby revised by the City Council as follows:

General Fund

Resources:		
Franchise Revenue	$	88,000
Loan Proceeds		240,000
Requirements:		
Special Appropriations:		
Capital Outlay	$	240,000
Transfers Out		88,000

Capital Projects Reserve Fund

Resources:		
Transfers In	$	88,000
Requirements:		
Special Appropriations:		
Capital Outlay	$	88,000

Passed by the City Council June 25, 2018, and made effective the same date.

Attest:

Mayor Jake Pieper

City Recorder Teri Davis

CITY OF BROOKINGS

RESOLUTION 18-R-1143

A RESOLUTION OF THE CITY OF BROOKINGS TRANSFERRING APPROPRIATIONS FROM GENERAL FUND CONTINGENCY TO JUDICIAL, LEGISLATIVE/ ADMINISTRATION, AND PARKS AND RECREATION.

WHEREAS, the City of Brookings ("City") is a municipal corporation which is subject to Oregon Budget Law; and

WHEREAS, ORS 294.463(2) allows the governing body to transfer from Contingency to other appropriations category, up to 15% of the total appropriations of the fund, and

WHEREAS, expenditures will be more than expected in the General Fund, Judicial, due to PERS expenditures, and

WHEREAS, expenditures will be more than expected in the General Fund, Legislative/Administration due to unexpected legal expenditures for labor negotiations, and contractual expenditures due to the housing study and economic development contracts with South Coast Development Council, and

WHEREAS, expenditures will be more than expected in the General Fund, Parks and Recreation, contractual due to equipment rental expenditures, and

WHEREAS, the City Council approves transferring those funds from Contingency, and

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Brookings hereby transfers $45,500 from General Fund Contingency to Legislative/Administration, Parks and Recreation, and Swimming Pool, pursuant to ORS 294.463(2).

BE IT FURTHER RESOLVED THAT that for the fiscal year beginning July 1, 2017, and for purposes shown below are hereby revised by the City Council as follows:

General Fund

Requirements:	
Judicial	$ 2,000
Legislative/Administration	36,000
Parks and Recreation	7,500
Contingency	(45,500)

Passed by the City Council June 25, 2018, and made effective the same date.

Attest:

Mayor Jake Pieper

City Recorder Teri Davis

CITY OF BROOKINGS

RESOLUTION 18-R-1144

A RESOLUTION OF THE CITY OF BROOKINGS TRANSFERRING APPROPRIATIONS FROM GENERAL FUND, STREETS FUND, WATER FUND, AND WASTEWATER FUND CONTINGENCY.

WHEREAS, the City of Brookings ("City") is a municipal corporation which is subject to Oregon Budget Law; and

WHEREAS, ORS 294.463(2) allows the governing body to transfer from Contingency to other appropriations category, up to 15% of the total appropriations of the fund, and

WHEREAS, expenditures will be more than expected in the General Fund, Streets Fund, Water Fund, and Wastewater Fund due to workers' compensation rates increasing 27% compared to the prior rates, and

WHEREAS, the City Council approves transferring those funds from Contingency, and

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Brookings hereby transfers $9,533 from General Fund Contingency, $805 from Streets Fund Contingency, $2,693 from Water Fund Contingency, and $5,399 from Wastewater Fund Contingency, pursuant to ORS 294.463(2).

BE IT FURTHER RESOLVED THAT that for the fiscal year beginning July 1, 2017, and for purposes shown below are hereby revised by the City Council as follows:

General Fund

Judicial	$	11
Legislative/Administration		77
Police		7,325
Fire		753
Planning/Building		116
Parks		993
Finance		76
Swimming Pool		182
Contingency		(9,533)

Streets Fund

Streets maintenance	$	805
Contingency	$	(805)

Water Fund

Water Distribution	$	1,798
Water Treatment		895
Contingency	$	(2,693)

Wastewater Fund

Wastewater Collections	$	3,471
Wastewater Treatment		1,928
Contingency	$	(5,399)

Passed by the City Council June 25, 2018, and made effective the same date.

Attest:

Mayor Jake Pieper

City Recorder Teri Davis

Res 18-R-1144, Contingency transfers-workers compensation

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Signature (submitted by)

Originating Dept: Parks

City Manager Approval

Subject: Memorandum of Understanding with Brookings Harbor Garden Club

Recommended Motion:
Motion to authorize the Mayor to execute a new Memorandum of Understanding with the Brookings Harbor Garden Club with respect to City property landscape maintenance.

Financial Impact:
The $3,000 annual cost of maintaining the landscape areas is budgeted from Park Contract Services.

Reviewed by Finance & Human Resources Director

Background/Discussion:
For the past 5 years, the Brookings Harbor Garden Club (BHGC) has been maintaining the City-owned landscaped area along Chetco Avenue between Ross Road and the Ray's Market driveway, and the landscaped area in the quad area of City Hall. These areas were previously maintained by City park staff.

The BHGC currently maintains the Botanical Garden located on ODOT property at the intersection of Chetco and North Bank Chetco River Road.

Under the new terms of the proposed Memorandum of Understanding (MOU), the BHGC membership will continue the responsibility for maintaining these areas for the next year and the City will provide the BHGC with a $3,000 annual stipend. The City would continue to maintain the grass.

Attachment(s):

a. 2018-19 Memorandum of Understanding with Brookings Harbor Garden Club.

MEMORANDUM OF UNDERSTANDING
BETWEEN CITY OF BROOKINGS AND
BROOKINGS HARBOR GARDEN CLUB

The parties to this Memorandum of Understanding (MOU) are the City of Brookings (CITY), an Oregon municipal corporation, and the Brookings Harbor Garden Club (CLUB), an Oregon non-profit corporation.

WHEREAS, CITY owns the landscaped area along the north side of Chetco Avenue between Ross Road and 5th Street;

WHEREAS, CLUB currently cares for and maintains that area located on Oregon Department of Transportation property known as the Botanical Garden;

WHEREAS, CLUB had demonstrated ability to maintain public landscape areas;

WHEREAS, CITY is restructuring the manner in which it maintains its public landscape areas and desires to work with non-profit groups in the maintenance of these areas;

WHEREAS, CLUB has expressed interest in partnering with the CITY in this regard.

NOW, THEREFORE, the parties agree as follows:

1.0 CLUB OBLIGATIONS

1.01. Provide pruning, trimming, weed removal, mulching and general maintenance for:
   a. Brookings City Hall landscaped areas (south parking lot landscape areas, courtyard, north entry and landscape areas)
   b. The landscaped area along the north side of Chetco Avenue between Ross Road and 5th Street.

1.02. Maintain plants, shrubs ground cover and trees

1.03. Perform general litter clean-up as needed.

1.04. Remove all vegetation debris and haul to the Public Works upper yard located at 715 Railroad Street.

2.0 CITY OBLIGATIONS

2.01. Provide and maintain all irrigation systems and water service.

2.02. Mow all grass areas

2.03. Prune and/or remove large plants and trees deemed unsafe and remove invasive noxious weeds as specified by CLUB

2.04. Perform general litter and animal feces clean up in grassy areas.

2.05. Coordinate its maintenance activities with those of CLUB.

2.06. Provide new plants, fertilizer, and mulch.

3.0 INSURANCE REQUIREMENT

CLUB will provide CITY with proof of an insurance policy covering general commercial liability on an occurrence basis, with a combined single limit of not less than $1,000,000 for each occurrence of bodily injury, personal injury and property damage. City to be listed as additionally insured on the policy.

4.0 TERM
This agreement shall take effect upon the execution of this agreement, and shall remain in effect for a period of 1 year ending June 30, 2019 or until terminated as described in this agreement.

5.0 TERMINATION
Either party for any reason may terminate this agreement provided that written notice of termination is given no less than thirty (30) days prior to next six month scheduled payment.

6.0 STIPENDS
CITY will provide CLUB with an annual stipend of $3,000 payable in increments of $1,500 upon execution of this Agreement and $1500 on or around January 1, 2019.

7.0 MEETINGS
Duly appointed representatives of the parties shall meet as needed to address mutual maintenance concerns and review the respective parties' responsibilities under this Memorandum. Further, the parties agree to consider jointly undertaking improvement projects or major cleanup projects when resources beyond those normally available for maintenance become available to either party.

8.0 HOLD HARMLESS CLAUSE
CLUB shall defend, save, hold harmless, and indemnify the City, its officers, agents, and employees from all claims, suits, or actions of whatever nature resulting from or arising out of the activities of CLUB or its officers, employees, subcontractors, or agents under this MOU.

WHEREFORE, the parties have caused this MOU to be executed by their authorized representatives on this _____ day of June, 2018.

CITY OF BROOKINGS
An Oregon Municipal Corporation

_____
Jake Pieper, Mayor

ATTEST

_____
Teri Davis, City Recorder

BROOKINGS HARBOR GARDEN CLUB
An Oregon Non-profit Corporation

_____
Name:
Title:

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Signature (submitted by)

Originating Dept: Parks

City Manager Approval

Subject: Wild Rogue Relay - 2018

Recommended Motion:
Motion to authorize City Manager to sponsor the 2018 Wild Rogue Relay.

Financial Impact: The $2,000 sponsorship will be appropriated from the fiscal year 2018-19 Tourism Fund.

Reviewed by Finance & Human Resources Director: _____

Background/Discussion:
Staff met with the organizers of the Wild Rogue Relay event who expressed interest in using Azalea Park for a fourth year as the terminus for the event. At this meeting they requested the City waive park use fees and continue to be a major sponsor of the run as we have the previous three years.

On May 29th, Council authorized a fee waiver and associated service fees for the use of Azalea Park for the terminus of this event.

On June 14th, the Tourism Promotion Advisory Committee (TPAC) recommended Council authorize a $2000 sponsorship to be used from the fiscal year 2018-19 Tourism Fund.

The event was held on June 16th. This was the sixth year for the Relay, and the fourth year that the event concluded in Brookings. The event started at Applegate Reservoir and covered a 215-mile route to the coast. There were over 1200 participants in the event. Combined with family members, vendors and other volunteers, this event attracted more than 2,500 visitors to Brookings. Organizers estimate that approximately 40 per cent of those that participated in the event stayed overnight.

Attachments:

a. Fee Waiver and Sponsorship Request

Tony Baron

From: Sarah Brendle
Sent: Thursday, May 03, 2018 1:56 PM
To: Tony Baron
Subject: Re: FW: WRR help

Hello Tony,
We would like to request your continued support of The Wild Rogue Relay by asking that you waive the $1000 in fees and that you contribute $2000 to our organization for the 2018 Wild Rogue Relay. We look forward to many years of mutual benefit as we grow this event and the number of visitors we are able to bring to this wonderful city.

Please let me know if we can do anything to further contribute to economic growth in Brookings.

I will send the application as soon as I get all of the items together.

Thank you!

On Thu, May 3, 2018 at 9:28 AM, Tony Baron <abaron@brookings.or.us> wrote:

Copy/edit below in a new email

From: Jim Brendle [mailto:jim@smokymountainrelay.com]
Sent: Thursday, May 19, 2016 2:46 PM
To: abaron@brookings.or.us
Subject: WRR help

Tony Baron
Director of Parks and Recreation
City of Brookings
898 Elk Dr.
Brookings, OR 97415

Dear Tony,

We are happy with the changes with our event that brought us to Brookings this past year. We appreciate all of your efforts to welcome our participants and create a positive experience for them in Brookings. Being the first year for Brookings to host our finish line, we learned a lot and should be able to have a smoother, more positive experience for everyone involved for this upcoming event.
We would like to request your continued support of The Wild Rogue Relay by asking that you waive the $1000 in fees and that you contribute $2000 to our organization. We have a larger number of participants this year and the local hotel rooms and VRBO listings were filled much earlier this year. We look forward to many years of mutual benefit as we grow this event and the number of visitors we are able to bring to this wonderful city. Please let me know if we can do anything to further contribute to economic growth in Brookings.

Thanks!

Jim Brendle
Race Director Wild Rogue Relay
jim@smokymountainrelay.com

541-951-9939

--
Sarah Brendle
Sponsorship Coordinator
www.thewildroguerelay.com

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Signature (submitted by)

Originating Dept: Finance & HR

_City Manager Approval

Subject:

Adjustments to Non-Represented Employee Compensation Plan.

Recommended Motion:

Motion to amend the City of Brookings Management Compensation Plan as recommended by the City Manager in the Council Agenda Report dated June 25, 2018.

Financial Impact:

The agreement is within the financial parameters for employee compensation as adopted in the 2017-18 and 2018-19 budget. The total additional cost is $13,300 for 2017-18, and $26,300 for 2018-19.

Background/Discussion:

The City Council periodically updates the Management and Non-Represented Employee Compensation Plan. This update typically follows agreements reached with the two bargaining units and has generally been effective at the beginning of the fiscal year. The City reached an agreement with the General employees bargaining unit in August 2017.

Prior to settling with the Police Association, the City Manager brought forward a request in February for a compensation adjustment for the 7/1/2017 COLA, matching that of the General employees.

Since that time, Council approved the Police association contract on May 14, 2018. There are a few provisions, in addition to the adjustment made for 7/1/2017 COLA, that the City Manager recommends be changed for management employees to align their pay and benefits with these employees.

1. Salaries:
    a. Effective January 1, 2018, a salary increase of 1.5%.
    b. Effective June 1, 2018, a salary increase of 1.0%.
    c. Effective July 1, 2018, a salary increase based on the All Cities CPI-W February Index with a minimum 2.0% and a maximum of 4.0% (actual 2.3%).
    d. Effective January 1, 2019, a salary increase of 1.0%.

2. Compensatory time maximum increased from 120 hours to 150 hours (only applicable to non-exempt employees).

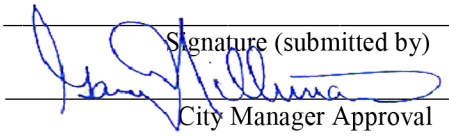
3. Call-back minimum increased to 3 hour minimum on all call-back except those for court appearance in Brookings, which was increased to 2 hour minimum (applicable to Sergeants only).
4. Add article so that employee is paid full salary and benefits for the first 60 days of lost time as a result of an on-the-job injury or illness.

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Originating Dept: City Manager



Signature (submitted by)

City Manager Approval

Subject: Legislative Priorities

Recommended Motion:
Motion to adopt top four legislative priorities for 2019 and determine four least desirable legislative priorities and forward them to the League of Oregon Cities.

Financial Impact:
None

Reviewed by Finance & Human Resources Director: _____

Background/Discussion:
The League of Oregon Cities is developing its 2019 legislative program and has requested that each member city provide them with their legislative priorities and non-priorities for the year. The League has distributed a survey form. Please bring this form with you to the June 25 meeting with your priorities and non-priorities noted. The information you provide will be aggregated into the top four and bottom four City Council issues at the meeting.

Attachment(s):

a. Correspondence and form from League of Oregon Cities.

LEAGUE of Oregon CITIES

1201 Court Street NE, Suite 200 • Salem, Oregon 97301
(503) 588-6550 • (800) 452-0338 • Fax: (503) 399-4863
www.orcities.org

June 6, 2018

Dear Chief Administrative Official:

For the past three months, eight policy committees have been working to identify and propose specific actions as part of the League's effort to develop a pro-active legislative agenda for the 2019 session. They have identified legislative objectives as set forth in the enclosed ballot and legislative recommendation materials. These objectives span a variety of issues and differ in the potential resources required to seek their achievement. Therefore, it is desirable to prioritize them in order to ensure that efforts are focused where they are most needed.

While the attached ballot reflects the top policies developed in each of the policy committees, each undertook a broad look at a range of issues impacting cities. Many issues reflect the League's ongoing mission to support cities' work and their home rule authority to develop and use a variety of tools to meet the needs of residents but were not included in the ballot. Additional issues, such as addressing the housing shortage and the opioid crisis, are multifaceted and did not fit concisely into policy priorities. However, they remain as work the League intends to accomplish as it works with large groups of stakeholders in search of solutions.

Each city is being asked to review the recommendations of the policy committees and provide input to the LOC Board of Directors as it prepares to adopt the League's 2019 legislative agenda. After your city council has had the opportunity to review the proposals and discuss them with your staff, please return the enclosed ballot indicating the top four issues that your city council would like to see the League focus on during the 2019 session. **The deadline for response is August 3, 2018.** The board of directors will then review the results of this survey of member cities, along with the recommendations of the policy committees, and determine the League's 2019 legislative agenda.

Your city's participation and input will assist the board in creating a focused set of specific legislative targets that reflect the issues of greatest importance to cities. Thank you for your involvement, and thanks to those among you who gave many hours of time and expertise in developing these proposals.

Do not hesitate to contact me or Craig Honeyman, Legislative Director, with questions.

Sincerely,

Mike Cully
Executive Director

Craig Honeyman
Legislative Director

P.S. If you are reviewing the hard copy of this ballot and would like to view the linked material please visit the following web address and click on the links there:
http://www.orcities.org/Portals/17/Legislative/2019PolicyBallotInformation.pdf

INSTRUCTIONS

1. Each city should submit one form that reflects the consensus opinion of its city council on the **top four** legislative priorities for 2018.

2. Simply place an **X or a check mark** in the space to the left of the city's top four legislative proposals (last pages of the packet).

3. The top four do not need to be prioritized.

4. Return by **August 3rd** via mail, fax or e-mail to:

Jenna Jones
League of Oregon Cities
1201 Court St. NE, Suite 200
Salem, OR 97301
Fax – (503) 399-4863
jjones@orcities.org

Thank you for your participation.

City of: _____

Please check or mark 4 boxes with an X that reflects the top 4 issues that your city recommends be added to the priorities for the League's 2019 legislative agenda.

Legislation

A. 9-1-1 Tax	☐
B. Annexation Flexibility	☐
C. Auto Theft	☐
D. Beer and Cider Tax Increase	☐
E. Broadband Infrastructure	☐
F. Carbon Cap-and-Invest Program Adoption	☐
G. City Comparability for Compensation	☐
H. Green Energy Technology Requirement Changes	☐
I. Infrastructure Financing and Resilience	☐
J. Least Cost Public Contracting	☐
K. Local Control Over Speed Limits on City Streets	☐
L. Lodging Tax Definition Broadening	☐
M. Mental Health Investment	☐
N. Permanent Supportive Housing Investment	☐
O. PERS Reform	☐
P. PERS Unfunded Liability Revenue Stream Dedication	☐
Q. Place-Based, Water Resource Planning (Program Support)	☐
R. Property Tax Reform	☐
S. Qualification Based Selection (QBS)	☐
T. Right-of-Way and Franchise Fee Authority	☐
U. Safe Routes to School Match	☐
V. Small Area Cell Deployment	☐
W. Speed Cameras	☐
X. Speed Limit Methodology	☐
Y. Third Party Building Inspection	☐
Z. Tobacco Taxes Share Increase	☐
AA. Waste Water Technical Assistance Program	☐
BB. Wetland Development Permitting	☐
CC. Wood Smoke Reduction Program Support	☐

In addition to your ranking of the priorities shown above, please use this space to provide us with any comments (supportive or critical) you may have on these issues, or thoughts on issues or potential legislative initiatives that have been overlooked during the committee process.):

A. 9-1-1 Tax

Legislation:
Support legislation enhancing the effectiveness of the state's emergency communications system by increasing the 9-1-1 tax and/or seeking other sources of revenue and prohibiting legislative "sweeps" from emergency communications accounts managed by the Oregon Office of Emergency Management.

Background:
The League worked with other stakeholder groups in 2013 to extend the sunset date on the statewide 9-1-1 emergency communications tax to January 1, 2022 (HB 3317). In 2014, the League also worked to pass legislation including prepaid cellular devices and services under the 9-1-1 tax (HB 4055). As concerns mount with regard to disaster preparedness and recovery and as upgrades to communications technology become available, it is apparent that state and local governments do not have the resources necessary to address challenges or take advantage of opportunities (see an analysis in the League's 2018 State Shared Revenue Report, here, and the Oregon Office of Emergency Management's "Emergency Communications Tax" webpage, here. Additional funding is needed and the practice of periodically sweeping funds out of the state's emergency management account for other uses must cease. It is worthy of note that the practice of "sweeps" disqualifies the state from receiving federal funds for emergency communications. It is unknown how many federal dollars have been foregone as a result of this policy.

Presented by the Telecom, Broadband & Cable Committee and endorsed by the Finance & Taxation Committee

B. Annexation Flexibility

Legislation:
The League will work to increase the flexibility for cities to annex residential areas and to encourage voluntary annexations, with a primary focus on improving the island annexation process.

Background:
There is a significant disconnect between the state's land use process and the process of annexation, which has created issues for a variety of cities. The annexation process requirements are particularly difficult for areas known as "islands". Even though cities can involuntarily annex islands, most cities have adopted a policy to only engage in voluntary annexation. This has left significant islands un-annexed. In addition, waiting for surrounding properties to voluntarily annex often means the process and order of annexation does not necessarily match the plans for infrastructure development. Unannexed lands remain on the buildable land supply but much of it will contain some level of development that was approved by the county, but is often underdeveloped when compared to the comprehensive plan.

However, there have been bills that have been introduced over the last few sessions that aim to make non-voluntary annexation more difficult (see e.g., HB 2039 and HB 2040). As these bills have gotten hearings, the League has taken the opportunity to discuss how annexation and land use are very disconnected. This is particularly of interest as interest in housing development remains at the top of the list of legislative priorities. If local governments have greater control over the annexation process and can better incentivize voluntary annexation, they can better meet the development expectations of the land use system and their comprehensive plans. It also assists in the orderly development of infrastructure.

Tools that were recommended to consider included partial island annexation in residential areas, relaxation of the limit of 10 years to bring a property fully onto the city's property tax level, changing the boundary requirements for islands, and looking at how the withdrawal of special district territory can be better regulated.

Presented by the Community Development Committee

C. Auto Theft

Legislation:
Address the deficiencies in the Unauthorized Use of a Motor Vehicle statute that were created after an adverse court ruling.

Background:
A 2014 Oregon Court of Appeals ruling requires that prosecutors prove beyond a reasonable doubt that a person driving a stolen car knew they were in violation of the law prohibiting the unauthorized use of a motor vehicle. Because of this ruling, unless confesses to the crime, obtaining a conviction for stealing a car is near impossible. The National Insurance Crime Bureau's 2017 "Hot Spots" report stated that Oregon experienced a 19 percent increase in auto theft over 2016. News stories on this issue may be found here, here and here.

Because of the ruling, auto theft has increased exponentially across rural and urban Oregon. A legislative fix was proposed in 2018 and was generally agreed to but was never voted on by either chambers due to the fiscal impact it would have on the state. A copy of the legislation can be found here. This issue was brought to the Committee by a representative of the Oregon Association of Chiefs of Police and they have requested the League's supported in seeking to fix this issue. Of particular concern to the General Government Committee was the fact that vehicles being stolen tend to be older cars and trucks that are more likely to be owned by people of more modest means who would be unable to readily replace their vehicles without considerable impact.

Presented by the General Government Committee

D. Beer and Cider Tax Increase

Legislation:
The League proposes increasing the state taxes on malt beverages and cider to assist with rising public safety costs, improve public health, reduce alcohol consumption by minors, and provide alcohol tax equity with wine and liquor.

Background:
Oregon's tax has not been increased since 1978 and is currently $2.60 per barrel which equates to about 8 cents on a gallon of beer. The tax is by volume and not on the sales price. (Yes, the bottle deposit is 60 cents and the tax is only about 4 cents on a six-pack!) Oregon is tied with Kentucky for the lowest beer taxes of all states (see page 98 in link). To get to the middle, Oregon would need to raise the tax to 80 cents per gallon (10-fold increase). Cities are preempted from imposing alcohol taxes. In exchange, cities receive approximately 34% of the state alcohol revenues (see page 9 in link)(beer and wine taxes, license fees, and liquor profit sharing) as state shared revenues. However, because the tax is so small on beer, the share is also small. The beer tax brings in only about $7 million per year state-wide; thus, the city share is about $2.3 million of the total shared revenues. The total share for cities for all alcohol-based state shared revenues is estimated at over $86 million. The League anticipates that excise tax increases including those on alcohol will be a part of revenue package discussions in 2019, and the League sees this concept as an important leveraging tool.

Presented by the Finance and Tax Committee and endorsed by the General Government Committee

E. Broadband Infrastructure

Legislation:
Seek additional state support and funding for increased and equitable broadband infrastructure deployment, especially in rural areas. Oppose legislative efforts to restrict existing municipal authority to provide broadband services.

Background:
The deployment of broadband and telecommunications networks and services (public and/or private) throughout Oregon is critical to economic development, education, health and safety and the ability of residents to be linked to their governments. Mapping research shows large areas of the state either not served or underserved by competitive broadband technology. A significant barrier to the deployment of broadband infrastructure is funding. Cities need additional funding and support from various sources, including the state and federal government, allocated for increased or new broadband infrastructure, especially for fiber connections to schools, community libraries, and public safety buildings. Also, oppose efforts by private internet service providers to restrict local efforts to make broadband technology available within their jurisdiction.

Presented by the Telecom, Broadband & Cable Committee

F. Carbon Cap-and-Invest Program Adoption

Legislation:
The League's Energy & Environment Policy Committee has recommended support, if specific principles are recognized and codified, of legislation that would implement a statewide cap on carbon emissions over time and that would generate revenues for strategic investments that further Oregon's greenhouse gas reduction goals. The cap on emissions would apply to certain "regulated entities" with carbon emissions over 25,000 metric tons annually. Regulated entities would receive allowances, or would generate offset credits, to emit carbon. The revenue from the purchase of allowances would be invested in specified programs aimed at furthering GHG reductions and mitigating program impacts. It is anticipated that funds generated from a cap on the transportation fuel industry may be subject to use per state Constitutional requirements related to the state highway fund. The statewide cap on carbon would be reduced over time to meet updated greenhouse gas reduction goals for Oregon.

For the League to support a statewide cap on carbon, the following principles would need to be recognized and codified in any legislation:

- The legislation and subsequent rulemaking processes would need to establish a forum to generate meaningful dialogue with rural Oregon communities and those with energy-intensive, trade-exposed industries. Equity considerations should be considered throughout this process by including cities and counties representing a variety of populations, regions of the state, and community demographics (e.g. low-income and underserved populations). Specific action should be taken to have representation from cities with populations of less than 1,500.
- The cap would need to apply to all sectors including utilities, industry and the transportation fuels sector (e.g. fuel producers) if annual carbon emissions exceed 25,000 metric tons.
- The program should be designed to link to the Western Climate Initiative which has a multi-jurisdictional carbon market (linking with programs in California, Ontario and Quebec)
- The revenue from the purchase of allowances would be invested in evidence-based technologies to reduce emissions from regulated sectors with excess revenues being invested in statewide programs to support climate resilience and rural Oregon economies. Requiring the reinvestment of allowance revenue will help regulated sectors become more efficient over time and less carbon intensive.

- In addition, LOC will advocate that additional revenues generated be dedicated to support programs including:
    - Technical assistance grants that local governments could access to help fund the adoption and implementation of local climate action/sustainability plans.
    - Funding for local woodstove smoke reduction programs to help communities in, or at risk of, non-attainment from woodstove smoke.
    - Funding to study and incentivize an expanded, yet sustainable, cross-laminated timber industry in Oregon with the intent of stimulating job creation in rural Oregon communities.
    - Funding for drought mitigation planning and resilience for Oregon water systems.

Background:
The League anticipates that the Legislature is very likely to pass legislation during the 2019 session that would implement a "cap-and-invest" program in Oregon, similar to the program adopted by California. Similar legislation has been considered by the Oregon Legislature during previous legislative sessions, but has failed to be brought for a vote. The political will to pass such a policy/program for Oregon appears to be incredibly strong; the Speaker of the House and President of the Senate are co-chairing the Joint Interim Committee on Carbon Reduction and the Governor's team is staffing a new Carbon Policy Office to assist in the Committee's efforts. The League's Energy & Environment Committee has spent considerable time discussing this policy, including how best to craft a policy recommendation that makes both environmental and economic sense for the state and cities.

Presented by the Energy & Environment Committee

G. City Comparability for Compensation

Legislation:
The League will seek legislation to ensure that cities are compared only with cities of a similar cost of living when negotiating with strike prohibited bargaining units.

Background:
Oregon labor law doesn't allow police officers, firefighters, emergency communicators and other public safety critical employees to strike. Instead when an impasse is reached when bargaining with labor unions that represent those workers, the state proscribes a set procedure involving an outside arbitrator to resolve those contract disputes. In that process the arbitrator will compare the city to other cities of similar size. As a result, the cites in rural areas are being compared with to cities in metropolitan areas that have different economic circumstances. Klamath Falls with 20,000 people in it and a median home value of $160,000 could be compared to Tualatin with a similar population and a median home value of $355,000. This is not a reasonable comparison.

The Human Resources Committee notes that the Legislature created a variable minimum wage in Oregon in recognition of the different costs of living across the state. Each Oregon county is assigned to one of three wage zones with one being the Portland Metropolitan area, that second are less populous regions and the third are rural counties. The Committee recommends that cities only be compared to cities in the same wage zones. A detailed explanation and graphics of the proposal may be found here.

Presented by the Human Resources Committee

H. Green Energy Technology Requirement Changes

Legislation:
Advance legislation to statutorily modify the existing "1.5 percent green energy technology for public buildings" requirement to allow for alternative investment options such as offsite solar or energy efficiency projects.

Background:
Oregon statute currently requires public contracting agencies to invest 1.5% of the total contract price for new construction or major renovation of certain public buildings on solar or geothermal technology. The requirement allows for offsite technology, but only if the energy is directly transmitted back to the public building site and is more cost-effective than onsite installation. Removing the requirement that an offsite project be directly connected to the public building project could result in increased flexibility for local governments to invest in solar projects that are more cost-effective and provide for increased solar energy generation. In addition, the League will advocate to allow 1.5 percent funds to be invested in alternative projects that provide a greater economic or social return on investment including energy efficiency.

Presented by the Energy & Environment Committee

I. Infrastructure Financing and Resilience

Legislation:
The League will advocate for an increase in the state's investment in key infrastructure funding sources, including, but not limited to, the Special Public Works Fund (SPWF), Brownfield Redevelopment Fund, and Regionally Significant Industrial Site loan program. The advocacy will include seeking an investment and set aside through the SPWF for seismic resilience planning and related infrastructure improvements to make Oregon water and wastewater systems more resilient.

Background:
A key issue that most cities are facing is how to fund infrastructure improvements (both to maintain current and to build new). Increasing state resources in programs that provide access to lower rate loans and grants will assist cities in investing in vital infrastructure. Infrastructure development impacts economic development, housing, and livability. The level of funding for these programs has been inadequate compared to the needs over the last few biennia and the funds are depleting and unsustainable without significant program modifications and reinvestments.

The funds are insufficient to cover the long-term needs across the state. While past legislative sessions have focused on finding resources for transportation infrastructure, the needs for water, wastewater, and storm water have not been given the same attention. A LOC survey of cities in 2016 identified a need of $7.6 billion dollars over the next 20 years to cover water and wastewater infrastructure projects for the 120 cities who responded. This shows a significant reinvestment in the Special Public Works Fund (SPWF) is needed to help meet the needs of local governments. Without infrastructure financing options, cities cannot meet the needs of new housing or new business – high priorities for cities across the state.

In addition, there is a critical need to improve upon the seismic resilience of public drinking water and wastewater systems. The Oregon Resilience Plan (2013) identified Oregon's water and wastewater systems as especially vulnerable to damage resulting from a Cascadia subduction zone earthquake. The plan recommended all public water and wastewater systems complete a seismic risk assessment and mitigation plan for their system. This plan would help communities identify and plan for a backbone water system that would be capable of supplying critical community water needs after a significant seismic event.

However, there is currently no dedicated funding to assist communities with this planning effort and the funding needed to repair/retrofit water infrastructure is significantly inadequate. Investments have been made in Oregon to seismically retrofit public safety facilities and schools, but without planning for infrastructure resilience, communities may not have access to water for critical needs, including drinking water and water for fire suppression, in the immediate aftermath of a seismic event.

This priority will focus on maximizing both the amount of funding and the flexibility of the funds to meet the needs of more cities across the state to ensure long-term infrastructure investment.

Presented by the Community Development Committee and endorsed by the Finance & Taxation and Water/Wastewater committees

J. Least Cost Public Contracting

Legislation:
Introduce and/or support legislation repealing Section 45(2)(a)(G) and Section 45(3)(a)(G) of HB 2017 (enacted in 2017) relating to compliance with least cost public contracting requirements as a condition for fuel tax increases after 2020.

Background:
As a matter of public policy, the League fundamentally disagrees with this linkage of transportation projects funding with public contracting standards applicable to specific local projects. Under HB 2017 (enacted in 2017) cities must comply with least cost public contracting standards set forth by ORS 279C.305 for subsequent the two-cent increases in the state gas tax to occur in 2020, 2022 and 2024. Literally interpreted, one recalcitrant city *might* be able to stop the next gas tax increase by its failure to comply with this statute.

Presented by the Transportation Committee and endorsed by Finance and Taxation Policy Committee

K. Local Control Over Speed Limits on City Streets

Legislation:
Introduce legislation that allows Oregon cities to opt-in (voluntarily) to adjust their speed limits on residential streets 5 mph lower than the statutory speed limit.

Background:
HB 2682 (enacted in 2017) allows the city of Portland to establish by ordinance a designated speed for a residential street under the jurisdiction of the city that is five miles per hour lower than the statutory speed provided the street is not an arterial highway. This authority should be extended to all cities and be considered permissive (not required). Cities should be able to determine speeds that are adequate and safe for their communities.

Presented by the Transportation Committee

L. Lodging Tax Definition Broadening

Legislation:
The League proposes adjusting and broadening the definitions of tourist, tourism promotion, and tourism-related facility as those terms are defined in the lodging tax statutes to ensure state-wide continued tourism and related economic (see page 17 of link) and tax growth (see page 223 of link), assist with city tourist costs, and provide local choice and revenue flexibility.

Background:
In 2003, when the state imposed a state lodging tax, the Legislature preempted cities by imposing restrictions on the use of local lodging tax revenues. (The percentage of restricted revenues varies by city.) Restricted tax revenues must be used for tourism promotion or tourism-related facilities. While the League will support all legislation that provides more flexibility on local tax usage, the League will advocate for lodging tax legislation that broadens those terms to clearly cover city costs of tourist events, tourism-related facility maintenance, tourist amenities, tourist attraction enhancement and public safety costs for special tourist events. Language from Section 3 of the dash 1 amendment to HB 2064 (2017) and Section 1 of HB 2064 (2017) will likely serve as a starting place. See also this power point presentation and this LOC testimony (supporting HB 2064) for further information.

Presented by the Finance and Tax Committee

M. Mental Health Investment

Legislation:
The League will seek to protect and enhance the investments made to Oregon's treatment of the mentally ill.

Background:
In 2015, the Legislature funded rental and housing assistance for persons suffering from mental illness, specialized training for police officers to assist people in mental health crisis, multi-disciplinary crisis intervention teams and expanded access to treatment. While providing direct mental health services is not a standard city service, the state of care for persons in crisis had deteriorated to the point city police officers were regularly the primary public employee to provide interventions. The December, issue of Local Focus was devoted to cities and mental health, those articles may be found here.

Because of the anticipated budget shortfalls in 2019, the General Government Committee would like the League to ensure that services established in 2015 are not cut and to capitalize on any opportunities that may exist or be created to enhance those investments.

Presented by the General Government Committee

N. Permanent Supportive Housing Investment

Legislation:
The League will support increased investments in the services that are provided to people who are living in permanent supportive housing.

Background:
Permanent supportive housing serves specific populations that traditionally face difficultly in remaining in housing due to additional, complex needs by providing housing and other services at the same time. A variety of populations, such as seniors, veterans, families, and those with mental health conditions, have different services that accompany their housing support. Permanent supportive housing models that use a Housing First approach have been proven to be highly effective for ending homelessness, particularly for people experiencing chronic homelessness who have higher service needs. Investment in the services is as important as the housing because residents that do not receive these additional supports often end up returning to homelessness based on issues related to their other issues.

However, in many areas the funding for housing is not well matched with the funding for the services. The state is the primary funding source for these services. However, there is some disconnect between the housing support provided by the Oregon Housing and Community Services Department (OHCS) and the Oregon Health Authority (OHA).

To help communities that are working to provide opportunities for permanent supportive housing and those seeking to find long-term solutions to local homelessness issues, better investment in the services is vital to success of these programs. By supporting appropriations to OHCS and OHA for these services, more support services can be provided to those that are in permanent supportive housing and lead to better outcomes.

Presented by the Community Development Committee

O. PERS Reform

Legislation:
The League will seek legislation to modernize the PERS investment pool, ensure proper financial controls are adhered to, and give cities a greater voice in how their monies are invested. The League will also seek legislation that shares the risk and costs of the pension benefit with employees but does so in a manner that impacts employees based on the generosity of the benefit plan they will retire under.

Background:
Oregon's Public Employee Retirement System (PERS) is a three-tiered program that provides a defined benefit pension (a pension that pays a retiree and their beneficiary a set amount for the length of their retirement) and a deferred compensation program that is funded through employee contributions. Each of the three tiers pays a different benefit and an employee's placement in a given tier is based on the date they were hired. Tier I is the most generous benefit and has on option for an annuity based retirement that has been incredibly expensive to maintain. Tier I was replaced by Tier II in 1996. Tier II costs, though reduced, were also unsustainable and were replaced with a third tier, known as the Oregon Public Service Retirement Plan (OPSRP) which is designed to provide a 45 percent salary replacement after a full career. A primer on the PERS system may be found here.

The cost to employers for this system has risen steadily since the market crash of 2008, and will increase again on July 1, 2019 (projected individual employer rates may be found here) and then again in 2021 and possibly again in 2023. Rates are anticipated to remain at a system wide average of around 29 percent of payroll and remain at that level until 2035 without reforms.
Adverse court rulings to previous attempts at reforms have limited our options to addressing benefits not yet earned. With that in mind the Human Resources Committee recommends reforms in the three following areas:

- Ensure that investments into the PERS system are achieving the maximum possible return in the most efficient manner possible while safeguarding the funds with proper financial controls.
- Requiring that employees absorb some of the costs for the pension system but ensure that OPSRP employees are impacted more favorably than Tier I and Tier II employees who will receive more generous retirement benefits.
- Establishing a fourth tier that provides similar benefits to employees but is funded in a more sustainable manner. Providing incentives to retirees and current employees in the other tiers to switch to the fourth tiers should be explored as well.

Presented by the Human Resources Committee

P. PERS Unfunded Liability Revenue Stream Dedication

Legislation:
The League proposes that a new state revenue stream be dedicated to paying down the unfunded liability over a period of years to sustain the Public Employees Retirement System (PERS).

Background:
The present unfunded liability has grown extraordinarily large and is causing rate increases for most local governments and schools that are not sustainable. The League would support all reasonable revenue stream ideas. Ideas include but are not limited to a new temporary limited sales tax, a new payroll tax, and a new temporary state property tax. The League will advocate that PERS cost-containment measures be pursued along-side revenue raising efforts to pay down the liability; both seem necessary to address the state-created problem.

Presented the Finance and Tax Committee and endorsed by the Human Resources Committee

Q. Place-Based, Water Resource Planning (Program Support)

Legislation:
The League will advocate for the funding needed to complete existing place-based planning efforts across the state.

Background:
Oregon's water supply management issues have become exceedingly complex. Lack of adequate water supply and storage capacity to meet existing and future needs is an ongoing concern for many cities in Oregon and is a shared concern for other types of water users including agricultural, environmental and industrial. Most of the surface water in Oregon (during peak season months) is fully allocated with no new water available. As a result, the ability to meet existing and future demand for various water uses will require collaboration, improved management and coordinated conservation among a variety of stakeholders, including municipalities. For this reason, the Legislature passed legislation to create a place-based planning pilot program in Oregon. This program, administered through the Oregon Water Resources Department, is providing a framework and funding for local stakeholders to collaborate and develop solutions to address water needs within a watershed, basin or groundwater area. Place-based planning is intended to provide an opportunity for coordinated efforts and the creation/implementation of a shared vision to address water supply challenges. Four place-based planning efforts are currently underway across the state in the Malheur Lake Basin, Lower John Day sub-basin, Upper Grande Ronde sub-basin and mid-coast region. Without continued funding, these efforts will not be able to complete their work. The LOC Water & Wastewater Policy Committee recognized that while this funding is limited to specific geographic areas, they also recognize the importance of successfully completing these pilot efforts and conducting a detailed cost/benefit analysis. It is a critical step in order to demonstrate the benefits of this type of planning. If these local planning efforts prove to be successful, there will likely be future efforts to secure additional funding for other place-based planning projects across the state.

R. Property Tax Reform

Legislation:
The League of Oregon Cities proposes that the property tax system should be constitutionally and statutorily reformed as part of the 2019 session work on state and local tax reform and improving funding for schools (see pages 69-72 of link; property taxes make up 1/3 of school funding).

Background:
The property tax system is broken and in need of repair due to Measures 5 and 50, which are both now over 20 years old. All local governments and schools rely heavily on property tax revenues to pay for services and capital expenses. Therefore, the League will participate in coalitions to help draft and advocate for both comprehensive and incremental property tax reform option packages. The League will remain flexible to support all legislation that improves the system, with a focus on a property tax package with these elements:

- To achieve equity, a system that transitions to a market-based property tax valuation system (RMV) rather than the present complex valuation system from Measure 50 (requires constitutional referral).
- To enhance fairness and adequacy, a system that makes various statutory changes, some of which would adjust the impact of a return to RMV. For example, the League supports a new reasonable homestead exemption (percentage of RMV with a cap) but also supports limiting or repealing various property tax exemptions that do not have a reasonable return on investment.
- To restore choice, a system that allows voters to adopt tax levies and establish tax rates outside of current limits (requires constitutional referral).

SJR 3 (see page 50 of link)(constitutional referral with return to real market value system) and SB 151 (see page 48 of link) (homestead exemption bill) from the 2017 session will likely serve as starting points. City property tax data including real market values and assessed values can be accessed here.

Presented by the Finance and Tax Committee

S. Qualification Based Selection (QBS)

Legislation:
The League will seek to reform the Qualification Based Selection (QBS) requirements to allow for the consideration of price in the initial selection of architects, engineers, photogrammetrists and surveyors.

Background:
The state currently prohibits the consideration of price when making an initial selection when awarding contracts for certain design professionals when conducting public improvements. Instead of issuing a request for proposals as is done with most public improvement projects, contracting agencies issue "requests for qualifications" on a project. Cities may negotiate price only after the initial selection of a contractor is made. Under this system a city or other contracting agency will never know the price of other qualified and responsible bidders on a project.

The League's General Government Committee concluded that this process is not in the interests of cities or tax payers as it precludes the use of competitive bids. There is no other area in which a consumer, public or private, would procure a service or product without considering the price.

Presented by the General Government Committee

T. Right-of-Way and Franchise Fee Authority

Legislation:
Oppose legislation that, in any way, preempts local authority to manage public rights-of-way and cities' ability to set the rate of compensation for the use of such rights-of-way.

Background:
In its commitment to the protection of Home Rule and local control, the League consistently opposes restrictions on the rights of cities to manage their own affairs. From time to time, in the context of public rights-of-way management authority discussions, proposals to restrict to this authority arise. Such was the case during the 2017 legislative session with SB 202 and SB 840. These efforts to restrict local authority often include proposals for a statewide right-of-way access policy and compensation system as well as limiting the ability of cities to charge fees of other government entities. This is contrary to local government management authority; the ability to enter into agreements with users of the right-of-way either by agreement/contract or ordinance; and to set the rate of compensation.

Presented by the Telecom, Broadband & Cable Committee

U. Safe Routes to School Match

Legislation:
Introduce legislation lowering the local Safe Routes to Schools matching grant requirement to 20 percent from 40 percent and lowering the matching grant requirement for areas qualifying for exceptions to 10 percent from 20 percent.

Background:
Section 123 of HB 2017 (enacted in 2017) authorizes the Oregon Transportation Commission to provide matching grants for safety improvement projects near schools. To receive the grant cities must provide a 40 percent cash match unless the school is located in a city with a population of less than 5,000; is within a safety corridor; or qualifies as a Title I school in which case the cash match requirement is reduced to 20 percent. While cities support the availability of matching grant funds provided by the state, the current cash match requirements are too high for most cities to participate in the program.

Presented by the Transportation Committee

V. Small Area Cell Deployment (also known as "Small Cell Deployment")

Legislation:
Oppose legislation that preempts local authority to manage public property while supporting deployment of wireless technology, including small area cell and 5G.

Background:
Legislative efforts involving the deployment of small area cell facilities are increasing around the nation. Currently 20 states (Arizona, Colorado, Delaware, Florida, Hawaii, Illinois, Indiana, Iowa, Kansas, Minnesota, North Carolina, New Mexico, Ohio, Oklahoma, Rhode Island, Tennessee, Texas, Utah, Virginia, and Washington) have passed bills that limit cities ability to collect appropriate and fair rights-of-way, permitting, and lease fees on municipal property; to control their own design and aesthetics; or otherwise manage wireless technology deployment within their jurisdictions. This type of legislation is not going away. In fact, it is just beginning.

During the 2017 session, the League was approached independently by representatives of two wireless companies with draft concepts that could have resulted in legislation compromising local authority to manage the deployment of small area cell and 5G technology. Issues raised included "shot clock" (time allowed for cities to rule on applications), fee structures and limits, contract terms and duration, land use issues etc. These efforts are expected to continue in 2019 and with greater urgency as the technology approaches deployment status. While cities in Oregon support the advent of new wireless technology including small cell and 5G, authority to ensure their deployment complies with local laws and policies must be maintained.

Presented by the Telecom, Broadband & Cable Committee

W. Speed Cameras

Legislation:
Introduce and/or support legislation authorizing cities to use fixed speed cameras at locations other than intersections.

Background:
Speeding is a public safety issue. The Oregon Transportation Safety Action Plan envisions no deaths or life-changing injuries on Oregon's transportation system by 2035. Currently, cities have the authority as a result of HB 2409 (enacted in 2017) to issue a speeding citation from the same camera and sensor system used to enforce red light compliance at intersections.

Further, speeding does not only occur at intersections. Additional automated enforcement, outside of intersections, would be a valuable a tool allowing cities to mitigate dangerous behaviors and speeding. In 2015, the Oregon Legislature granted the city of Portland the authority to implement a fixed speed safety camera program (HB 2621). The fixed speed camera systems have been operating on "urban high crash corridors" that are also part of the city of Portland's High Crash Network. While this program has not been in place long, the comparison of before and after speeds near the fixed photo radar system is indicating that the automated enforcement is positively influencing speed reduction (see PBOT report). This legislation would extend the authority to all Oregon cities to implement fixed speed safety camera programs to help reduce the number of deaths and serious injuries that occur as a result of speeding.

Presented by the Transportation Committee

X. Speed Limit Methodology

Legislation:
Introduce legislation that directs the Oregon Department of Transportation to develop a new speed setting methodology for cities and other urban areas that uses a safe systems approach validated by expert system tools as recommended by NTSB Safety Study SS-17/01.

Background:
The NTSB safety recommendations represent current data-driven best practices to determine speed limits. Currently, Oregon speed limits are set based on the guidance that speed limits in speed zones within cities should be within 10 mph of the 85th percentile speed as determined by .... The NTSB Safety Study SS-17/01, "Reducing Speeding-Related Crashes Involving Passenger Vehicles" concludes,

- "Speed increases the injury severity of a crash;"
- "...that unintended consequences of the reliance on using the 85th percentile speed for changing speed limits in speed zones include higher operating speeds and new, higher 85th percentile speeds in the speed zones, and an increase in operating speeds outside the speed zones;"
- "...that the safe system approach to setting speed limits in urban areas is an improvement over conventional approaches because it considers the vulnerability of all road users."

Presented by the Transportation Committee

Y. Third Party Building Inspection

Legislation:
The League will clarify the ability for local government programs to have private party building officials and building inspectors provide services for local building inspection programs, including recognizing that privately employed specialized inspectors can to perform specialized inspections.

Background:
Beginning in 2017, the League has been working to defend local building inspection programs that contract with third-party companies to provide building official and inspectors to run the local program. However, the Oregon Building Codes Division (BCD) has stated that the Oregon Department of Justice (DOJ) has informed BCD that programs that are structured this way violate the constitutional prohibition on delegating government authority. The League has repeatedly asserted that we disagree with that legal assessment. There was a bill introduced in 2018, HB 4086, that would have adopted new requirements for

local governments running programs. The League worked with other stakeholders to prevent passage of the bill, but we committed to working on a legally defensible solution that does not prevent these locally run programs from continuing.

After the session, the BCD determined that it would implement new rules for locally run inspection programs to meet the asserted legal opinion on delegation. On April 23, the BCD enacted emergency, temporary rules that added significant requirements for local building inspection programs. The new rules required local programs to designate a government employee as a city's building official. The rules also required the city to have a government- employed, certified electrical inspector. Both positions could be filled by hiring the person directly or by an agreement between municipalities to share the employee(s). The rules further stated that a shared employee could only service three jurisdictions.

In May, the Director of the Consumer and Business Services, who oversees the BCD, informed the League that the temporary rules were rescinded. The Department's decision to rescind the rules included a statement that they would seek a formal opinion from the DOJ to clarify the issue of delegation. However, the BCD did replace the rescinded rules with another temporary, emergency rule. This new rule was enacted on May 18 and states that a local government must appoint a government-employed building official.

In addition to the concerns about using third-party building officials, there is currently statutory prohibition on specialized inspectors that are employed in the private sector to complete specialized inspections. There are a limited number of these inspectors, and, without removal of this prohibition, larger scale projects will not be able to move forward because they cannot be inspected and permitted. This issue was the catalyst for the overall discussion related to third-party building officials, but is not related to the asserted legal claims.

There is a commitment to work on this issue in the 2019 session, but it remains an issue of high concern as it directly impacts the flexibility of local government choice on how to provide services at the local level. Using third-party providers allows smaller jurisdictions to have local, efficient programs that provide clarity for the local development community. It also allows a base of business for these companies, which also serve to provide over-flow capacity to programs that primarily staff these programs with government staff. Therefore, this issue is vital to the long-term success of locally run building inspection programs.

Presented by the Community Development Committee

Z. Tobacco Taxes Share Increase

Legislation:
The League proposes seeking a share of all state tobacco product tax revenues .to assist with rising public safety costs and provide state shared revenue equity.

Background:
Only cigarette tax revenues are included in the state-shared revenue distribution to cities and those revenues are decreasing; cities receive about 2% of the cigarette tax revenues or $3.6 million a year under the formula. Other tobacco (chew, snuff, cigars, pipe tobacco, etc.) is also taxed by the state and those revenues have been increasing (now over $60 million a year), but those revenues are distributed only to the state. Cities are preempted from taxing cigarettes and other tobacco products. However, cities are often left to enforce tobacco laws and handle sales and use complaints. The League proposes that cities should receive a fair share of all the tobacco tax revenues. The League anticipates that excise tax increases to cigarettes and other tobacco products, and a new vaping tax will be a part of revenue package discussions in 2019, and the League sees this concept as an important leveraging tool.

Presented by the Finance and Tax Committee

AA. Waste Water Technical Assistance Program

Legislation:
The League will advocate for the creation of a circuit rider program, within the Department of Environmental Quality, to provide needed technical assistance for communities on water quality issues, including wastewater treatment and permit compliance options. Staffing for the circuit rider program would be provided through a third-party contract (or contracts). The League will work to identify funding resources to support this program, including a possible set aside of Oregon's federal Clean Water State Revolving funds.

Background:
As Clean Water Act requirements for public wastewater systems continue to evolve, with new and more stringent requirements being placed on a number of Oregon communities; cities have expressed concern over how best to comply with those requirements, especially with the limited technical and financial resources that many face. The League's Water & Wastewater Committee discussed the need for technical assistance for communities experiencing these challenges and looked to an existing program within the Oregon Health Authority's (OHA) Drinking Water Services division as a template for addressing this need. The OHA funds a circuit rider program through a third-party contract. The program is funded through federal Drinking Water State Revolving Loan Funds. The program is intended to help more communities be successful in complying with state and federal requirements. The services provided through the program are free for communities with populations of less than 10,000.

Presented by the Water/Wastewater Committee

BB. Wetland Development Permitting

Legislation:
The League shall work to establish legislative authority for the Department of State Lands to assume the federal program from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act.

Background:
In many communities looking to develop in the wetlands creates regulatory uncertainty, particularly where development is occurring in previously un-identified wetlands, because there are two agencies that must provide permits, the Oregon Department of State Lands (DSL) and the U.S. Army Corps of Engineers (USACE). The state's process has set deadlines which provides certainty for developers. However, the USACE process is much less consistent or timely. This uncertainty increases risk related to development that can cause projects to stop before they start. In a time where cities are trying to encourage development to meet the housing shortages and economic development goals to support citizens, any increased barriers can impact success.

There is a process in place at the federal level that would allow for the state to assume the USACE permitting process increasing the efficiency and certainty in the process. The state has taken steps in the past to ensure alignment of the state program to the requirements for federal approval. However, there were concerns raised at the time that the process related to the Endangered Species Act and cultural resource protections. The DSL has continued to work on these conflicts and believes it is positioned to work with the federal government to assume the federal permitting process if so authorized by the state legislature. For further information, the DLS provided a presentation for the committee, available here.

Presented by the Community Development Committee

CC. Wood Smoke Reduction Program Support

Legislation: Support increased funding to support local wood smoke reduction programs and efforts. The League will advocate the need for an additional $3-5 million, recognizing that any additional funding to assist communities is helpful.

Background: Woodstove smoke is one of the most significant sources of fine particulate and toxic air pollution in Oregon, often jeopardizing public health and putting communities at risk of violating federal air quality standards. Woodstove smoke is a problem for many Oregon communities that struggle with both the public health impacts and economic threat of being designated as nonattainment under the federal Clean Air Act. To address this challenge, local governments need access to funding for wood smoke reduction programs. Such programs have proven effective at reducing wood smoke in communities and include public education, enforcement, incentives for woodstove change-outs (to ductless heat pumps or certified stoves, weatherization assistance for low-income households and providing residents with dry, seasoned fire wood which burns cleaner. A 2016 taskforce report that was submitted to the Legislature indicated that there are approximately 150,000 uncertified stoves in the state, and that while Oregon has a long and successful history of replacing woodstoves in certain communities, money is sporadic and limited. The report went on to suggest that "an allocation in the range of $3-5 million per biennium could target high-risk communities and would support a meaningful level of effort to replace old, dirty woodstoves."

In 2017, the Legislature provided $250,000 in funding for community wood smoke reduction programs. The need for local communities, including a number of small cities, is much greater.

Presented by the Energy & Environment Committee

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: Chetco Bar Fire Water Impact Analysis

Recommended Motion:
Motion to direct the City Manager to consult further with the City's water treatment contract operator and develop an action plan and budget for implementation of recommendations contained in the Technical Memorandum prepared by GSI Water Solutions in connection with the Chetco Bar Fire, and to seek federal funding to assist in implementing those projects.

Financial Impact:

Reviewed by Finance & Human Resources Director:

Background/Discussion:
The City contracted with GSI Water Solutions, Inc., to undertake a study on the possible short and long term impacts of the Chetco Bar Fire on the City water source of supply, and to make recommendations for mitigation measures.

The key finding is that the City's water source of supply has shown little or no impact from the Chetco Bar Fire, and the water extracted from the City's Ranney collector continues to be plentiful and of high quality.

However, the consultant recommends continued testing/monitoring for any changes for at least the next two years.

GSI and their subconsultant, Stillwater Sciences, has prepared a technical memorandum *"Findings and Recommendations for Water System Response and Protection Plan Following the Chetco Bar Fire - Final"* dated June 8, 2018. The City's goals for this project were to understand the potential near-term and longer-term impacts of the fire on the City's water supply. The scope of the project included the following primary tasks:

- Assess the City's raw water quality and potential treatment issues by collecting source water quality samples.
- Assess flow and channel conditions and potential geomorphic impacts to the City's Ranney well collector (river bank filtration system).
- Develop water system response and protection plan recommendations.

Monitoring and Field Activities

Two post-fire sampling events were conducted to collect water quality samples from the Ranney well collector, main stem Chetco River, and North Fork Chetco River. The samples were collected on January 30, 2018 (relatively drier condition) and March 23, 2018 (relatively wetter condition).

Water quality samples were analyzed for general water quality parameters, metals, nutrients, and microbials/pathogens. During the January 30, 2018 sampling event, geomorphologists also conducted field reconnaissance to visually inspect flow and channel conditions to assess the potential for scouring and sedimentation at the Ranney well collector, and identify upstream watershed locations for long-term visual monitoring for indications of these impacts.

Key Findings

Findings listed below are qualified by the limited sampling events conducted as part of this study. The two sampling events are *indicative of current conditions* and do not provide the information to statistically determine impacts of the fire.

- Results of the water quality sampling indicate no significant water quality impacts to-date.
- Most of the water quality parameters appear unaffected, with the exception of dissolved organic carbon, iron and aluminum detected in the surface water samples. However, these parameters remained undetected in the sample from the Ranney well collector (i.e. water entering the City's water system).
- Potential appears low for post-fire hydro-geomoprhic impacts at the City's Ranney collector through scouring or sedimentation at the gravel bar based on observations during field reconnaissance.
- Several possible modifications to the water treatment plant (WTP) were identified for improved treatment of water quality impacts from wildfires. Treatment modifications could take more than a year to implement and costs could be in the millions of dollars depending on the improvements. **However, these improvements are not recommended for implementation unless additional monitoring indicates specific water quality impacts.**

Key Recommendations

Findings from the study indicate no observed impacts of significance; therefore the recommendations focus on continued monitoring and operational considerations in the near-term.

Monitoring Recommendations

The consultant recommends that the City continue water quality monitoring in the watershed for at least the next two years to help provide an early warning in case conditions change. Continuing the same level of monitoring used in the study on a quarterly basis would cost approximately $24,000 annually. This approximates analytical lab costs at $1,000 per event, and assumes third party labor and equipment costs to conduct the sampling at $5,000 per event.

A second recommendation is that the City to continue photo monitoring at locations identified and actively track stream gage flow measurements to assess any changes to geomorphic impacts and risks to the Ranney well collector.

Operational Recommendations
The following operational recommendations were made by the consultant:

1. Develop a process control plan that specifies in particular chemical dosing protocols for any observed increase in turbidity, pathogens, or organic content. Additional monitoring at the WTP can also be conducted for iron and aluminum specifically, and tracking of chlorine demand at the Ranney well collector.
2. Consider installing variable frequency drives (VFD) for pumps at the Ranney well collector and WTP to extend daily operations and reduce instantaneous pumping rates. Retrofitting all of the existing pumps at the Ranney well collector and at the WTP with

VFDs would cost in the range of $100,000 to $150,000, including planning/engineering, equipment procurement and installation. The City could incrementally install VFDs over time to manage costs.

Other Planning Recommendations
Finally, because wildfire impacts on the City's source of water will be an on-going issue, GSI also recommends that the City look into planning studies and continued coordination with agencies active in the Chetco River watershed to:

1. Complete a supply vulnerability and resiliency assessment that defines level of service adjustments in response to emergencies or reduced supply capacity, and evaluate redundant source options that the City can begin to explore long-term. This could be done in cooperation with Harbor Water District, since they are in close proximity downstream and also have Ranney well collector system.

2. Coordinate with agencies including Oregon Department of Environmental Quality, Oregon Department of Fish and Wildlife, and U.S. Forest Service, to support monitoring objectives.

The GSI report has been reviewed by the City's water treatment operator, Jacobs engineering, Jacobs generally confers with the GSI findings and is prospering a proposal to implement the recommended monitoring regimen, which they believe can be achieved for less that the estimated cost listed above.

Jacobs will also work with the City to develop budgets and implementation schedules for installing the commended variable speed drive pump motors. The installation of VSPs will have additional benefits including energy savings and a greater ability to sustain water supply for fire flow during emergency events.

Attachment(s):
a. GSI Technical Memorandum dated June 8, 2018.
b. Wildfire Source Water Protection Sampling and Analysis Plan.
c. Jacobs Engineering Technical Memorandum dated June 5, 2018.

GSI Water Solutions, Inc.

Technical Memorandum

To: Gary Milliman, City of Brookings

From: Ronan Igloria, PE; Rodrigo Prugue

CC: Glen Leverich, RG, Stillwater Sciences; Pete Kreft, PE, Andrew Nishihara, PE, Stantec

Date: June 8, 2018

Re: **Findings and Recommendations for Water System Response and Protection Plan Following the Chetco Bar Fire - FINAL**

This technical memorandum (TM) documents findings and recommendations from the assessment of potential impacts to the City of Brookings' (City) water system following the Chetco Bar Fire in the summer of 2017.

1. Introduction

The City's source of water comes from the Chetco River watershed, a mostly forested area largely located on U.S. Forest Service (USFS) and U.S. Bureau of Land Management (BLM) lands. The City's raw water is collected through a subsurface intake system (also known as a "Ranney collector" and referred to as such in this document) located near the lower end of the Chetco River watershed at the confluence of the North Fork and mainstem of the Chetco River. Although this water is classified as a groundwater source by the Oregon Health Authority (OHA), the City has the option to treat the water at its conventional filtration water treatment plant (WTP), or deliver it directly after disinfection (by chlorination) to its 8,000 residents. The City has used the WTP when high river flows can result in slightly elevated turbidity water pumped from the Ranney Collector.

In July through October 2017, the Chetco Bar Fire burned nearly 192,000 acres. Approximately 153,000 of these acres are within the City's source watershed that is upstream of the Ranney collector. The USFS completed assessments of the burn area in the fall of 2017, and identified major impacts with the potential for immediate and long-term increases in runoff flows, erosion, and water quality risks.

Figure 1 (prepared by Stillwater Sciences) shows the extent of the Chetco Bar Fire and the watershed area upstream of the City's Ranney collector.

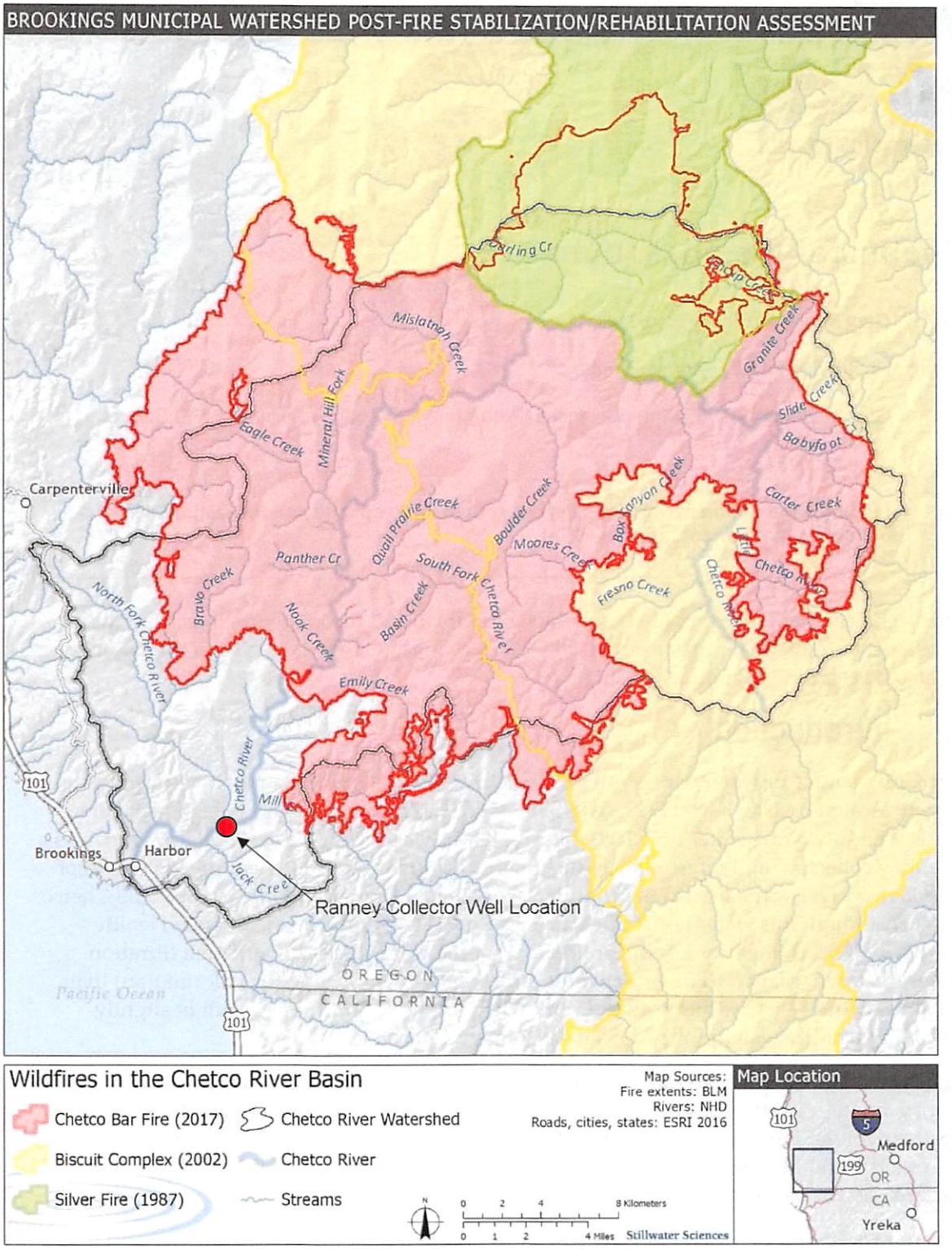


Figure 1. Extent of Chetco Bar Fire and Location of City of Brookings Ranney Collector Well (source data from BLM 2017; analysis by Stillwater Sciences).

The City's goals with this project are to understand the potential near-term and longer-term impacts of the fire on raw water quality, and the ability of the Ranney collector and WTP to provide safe and reliable drinking water.
To support these goals, the City applied for and received an OHA Drinking Water Source Protection Emergency grant, and used the funding to support in part a contract with GSI Water Solutions, Inc. (GSI), and project team partners Stantec and Stillwater Sciences, Inc. (Stillwater) to complete three primary tasks:

- Assess water quality in the City's source water and potential treatment issues. Develop a sampling and analysis plan (SAP), and collect baseline source water quality data to assess any changes to key parameters compared to historical data. Use information to evaluate potential treatment performance issues relative to operation of the City's WTP.
- Assess flow and channel conditions and potential geomorphic impacts to the City's Ranney collector. Review current Ranney collector configuration and flow/channel conditions, and perform a field survey of site and channel conditions. Use information to assess the potential for vertical and/or lateral channel scouring and/or deposition that may affect Ranney collector performance.
- Develop recommendations for a water system response and protection plan. To address long-term impacts, recommend near-term and long-term planning-level actions for source protection and watershed management.

2. Overview of Fire Impacts

The USFS completed a Burn Area Emergency Response (BAER) report for the watershed following the Chetco Bar Fire (USFS 2017a, b). The report noted that the intensity of the burn can cause physical changes to the drainage characteristics of the soils, reducing infiltration and increasing runoff from the watershed. Part of the watershed is extremely vulnerable to erosion in areas where vegetation has been denuded by the Chetco and other recent fires (e.g., Biscuit Complex Fire in 2002), thereby possibly creating a high potential for runoff to carry significantly greater quantities of silt and ash during heavy rain events. Additionally, increased runoff increases the risks of potential lateral and vertical channel scour from higher peak-flow events.

The USFS report also noted the potential risks from possible water quality impacts of the fire, including an increased risk of turbidity, dissolved organic compounds, nutrients, and metals in water entering the Ranney collector. Further, large quantities of aerial fire retardant (Phos-chek) were used to combat the fire, which could also affect water quality in runoff. It can be inferred from these general findings that any increased sediment-laden runoff could potentially reduce the filtering capacity of the City's Ranney collector and expose it to impacted water quality in the surface water. Because of the combined potential for channel scour exposing the Ranney collector, and potential for increased turbidity and poorer water quality, it could be difficult for the City to adequately treat the water. The USFS report also noted the risk of elevated levels of disinfection by-products (DBPs) as a result of chlorinating water that has higher levels of dissolved organics.

3. Project Water Quality Monitoring

Attachment A includes the SAP which was developed for this project[1]. The SAP was developed to collect early post-fire baseline water quality information and identify possible trends. Information also was used to conduct the assessments presented in this TM, including recommendations for additional monitoring and planning to mitigate potential impacts to the drinking water supply. Data collected from the SAP were not intended for quantitative analysis or analytical modeling and were not designed to meet any regulatory requirements.

Table 1 lists the analytical parameters included in the sampling. Analytes were selected to balance the data quality objectives and overall analytical costs.

The SAP originally planned for three sampling/monitoring events between early January and late April 2018 (within the period of the contract). The intent was to capture at least one relatively dry and one wet event, and one additional sample to help determine any trends. However, given weather patterns during this period and logistical/scheduling issues, only two sampling events were completed. The two events were a dry event (January 30, 2018) and a wet event (March 23, 2018), and provide a baseline for future follow-on monitoring.

A sample was collected from three locations as described in the SAP: (1) mainstem Chetco River upstream of the Ranney collector, (2) North Fork Chetco River upstream of the confluence with the mainstem; and from the Ranney collector pumping wetwell. Disinfection of the Ranney collector was stopped and water was allowed to dechlorinate before collecting the grab sample during the dry event. Due to operational issues encountered during the dry sampling event, city staff requested that the chlorination system not be shut off during the second sampling event. As a result, microbial parameters were not collected from the Ranney collector wet event. Grab samples for each event were collected by GSI staff with support from City staff from the same general location along the bank of the mainstem and North Fork and in the Ranney collector.

[1] The SAP was routed on January 18, 2018, for courtesy review and comment to OHA, Oregon Department of Environmental Quality (DEQ), and USFS staff involved in either the initial burn assessment or initial Chetco Bar Fire sampling by DEQ on the south coast. No comments were received from the agencies before the first scheduled sampling event.

Table 1. List of Analytical Parameters Included in Sampling and Analysis Plan

Analytical Parameter	Data Objectives and Comments
1. General a. Turbidity b. Total suspended solids c. Total settleable solids d. pH e. TOC (DOC) / UV254 f. Total hardness and total alkalinity g. TDS/conductivity h. Temperature i. TON j. Color (true and total)	Changes in these general water quality parameters between the Chetco River and the Ranney collector/WTP to assess whether any immediate actions will be required to mitigate for negative impacts from wildfire runoff. For example: • Increase in organics (TOC) could lead to increases in coagulant doses, depressed pH, and increases in disinfection by-products • Increase in turbidity could lead to WTP operational changes and/or extended operations, as well as higher sludge production
2. Typical Ions a. Na (sodium) b. Ca (calcium) c. Mg (magnesium) d. K (potassium) e. Cl (chloride) f. SO_4 (sulfate/sulfur) g. F (Fluoride)	Increased presence of different ions could impact aesthetic qualities of the drinking water including taste and color.
3. Nutrients a. Phosphorus (total, dissolved, vs. phosphates) b. Nitrogen (total, dissolved, nitrates/nitrites, ammonia)	Increase in nutrients could promote biological activity in the source water (e.g., algal blooms) and result in water quality and aesthetic changes. Ammonia could impact disinfection practices (chlorine dose and residual).
4. Metals a. Fe (iron) b. Mn (manganese) c. Sr (strontium) d. Al (aluminum) e. Ba (barium) f. Hg (mercury)	Additional EPA-regulated metals could be tested in Chetco River samples to establish a baseline. Iron and manganese would have the most impacts to aesthetics in the WTP, although chlorine injection in the Ranney collector can oxidize these constituents and remove them in the filter process at the WTP.
5. Microbials a. *Cryptosporidium* b. *E.coli/coliform* c. *Giardia*	Increase in microbial runoff could affect changes to regulatory requirements for disinfection. The increase in run-off could lead to increases in microbial activity in the river.

Notes:
EPA = U.S. Environmental Protection Agency, TDS = total dissolved solids, TOC = total organic carbon, TON = threshold odor number, WTP = water treatment plant.
Cyanide was also included in the SAP analyte list as a surrogate for presence of chemicals that may have been used in the watershed in the past, and because DEQ had analyzed for it in their September 2017 sampling at the Chetco River. However, it was not detected above reporting limits in the samples collected under this project, and is not recommended for inclusion in future monitoring.

3.1 Water Quality Monitoring Results

The first sampling event, conducted on January 30, 2018, is considered the dry event; however, based on historical weather data, some light precipitation occurred in the early hours of that day (ending approximately 4 a.m.). The second sampling event, conducted on March 23, 2018, is considered the wet event because of the relatively steady rain throughout

the day. Based on 15-minute flow measurements reported for U.S. Geological Survey (USGS) gage 14400000 on the mainstem Chetco River, the peak flow on the day of the wet event (9,420 cubic feet per second [cfs]) was significantly greater than during the dry event (5,460 cfs). However, it should be pointed out that it is unlikely that a positive correlation exists between flow magnitude and contaminant concentrations when sampling on two different times during the winter. This is because flow conditions prior to the sampling event has an effect on the rainfall-runoff response. That is, while the peak instantaneous flows were greater on the "wet" event on March 23 compared to the "dry" event on January 30, the annual peak event to date of 17,100 cfs occurred on January 24, soon before the January 30 sampling date. That large event would have had an effect on runoff and water quality conditions on the sampling day. It can also be said that conditions exhibited during the later sampling event in March would have been influenced by all rainfall-runoff accumulated to date since the fire.

General conditions during the sampling events are summarized in **Table 2.**

Table 2. General Conditions During Sampling Events

Condition	Event 1 (Dry) January 30, 2018	Event 2 (Wet) March 23, 2018
Mean temperature* (°F)	41 to 54 °F	41 to 46 °F
Total measured precipitation for the day*	0.24 inch	1.13 inches
Peak flow measured at Chetco River (measured from gauge: 14400000)	5,460 cfs	9,420 cfs

Notes:
* Weather conditions based on data from Weather Underground (KBOK location near Brookings, Oregon).
°F = degrees Fahrenheit
cfs = cubic feet per second

The complete laboratory reports for each sampling event and location are compiled under a separate cover for delivery to the City. **Table 3A** presents a summary of the results that are described below, **Table 3B** presents the physical parameters measured in the field during both sampling events.

At this time, it is difficult to conclude from the limited number of sampling events that the Chetco Bar Fire has impacted surface water quality measurably. However, in general, monitoring results do not indicate a significant difference between water quality in the North Fork and mainstem. The wet event samples generally had higher concentrations than the dry event samples. The exception is that for typical ions (see Table 3A), concentrations between dry and wet events were similar (even slightly lower for wet). It is unclear why concentrations in samples from the Ranney collector were similar to or, in many cases, greater when compared to North Fork and mainstem sample concentrations. A key exception is that all microbial tests from the mainstem and North Fork samples had positive hits (with the exception of *Cryptosporidium* and *Giardia* for North Fork samples), while the sample from the Ranney collector resulted in no detections.

For the dry event, aluminum concentrations exceeded the secondary maximum contaminant level (SMCL) in both the mainstem and North Fork samples; however, aluminum was not detected in the Ranney collector sample. Iron concentrations exceeded the maximum

contaminant level (MCL) in the Ranney collector sample[2], but iron was not detected in the mainstem or North Fork samples. In both cases, the concentrations of dissolved form were much lower than the total concentrations, indicating that a majority of the metals were in particulate form. The detection of iron in the Ranney collector sample may be an anomaly resulting from appurtenances within the caisson. It is likely that the City would have received some complaints or anecdotal stories about staining or other iron-related impacts if iron were naturally occurring and/or if iron concentration levels were consistently present year-round. It should be noted that raw water samples were being compared to MCL/SMCL concentrations, rather than finished water samples.

Based on the results of the two rounds of sampling from this project, there are no significant or conclusive indications that the Chetco Bar Fire has impacted water quality to-date. The exception would be the high detections of aluminum from North Fork and the main stem of the Chetco River, but the Ranney collector appears to be filtering the raw water effectively. The high iron concentrations from the January sampling event may have been an anomaly or sampling issue, since the March sample had concentration below the reporting limit despite having higher concentrations in the two surface water samples. Additional sampling should be collected to confirm any trends, especially for iron. In any case, chlorine injection in the Ranney collector can oxidize iron and remove them in the filter process at the WTP.

3.2 Comparison of Results to Historical Water Quality

Readily-available historical water quality data were reviewed to compare against the post-fire water quality data collected as part of this project. These historical data included:

- **Raw water data collected by the City as part of its water system operations.** Historical raw water quality data were limited to those obtained by Stantec in its review of WTP operations. The City provided historical raw water data on alkalinity and conductivity[3].
- **Recent data from the DEQ Statewide Source Water Toxics Monitoring Program report (collected in 2013).** Samples were collected from the Chetco River below Jack Creek, which is about 1 mile downstream of the City's Ranney collector.
- **Recent surface water sample collected by DEQ in south coast watersheds in response to the Chetco Bar Fire (September 2017).** The sample was collected from the Chetco River approximately 220 feet southwest from the City's Ranney collector.

These historical data are included in **Attachment B** for reference. In general, the concentrations of alkalinity and conductivity measured recently were within historical ranges of City data. Several of the typical ion (e.g. calcium, sodium, sulfate) concentrations from the DEQ data in 2013 were also similar. The most recent DEQ samples collected immediately after the fire showed similar general water quality parameters, except that pH was higher (8.3) than measurements in this project (7.5). The reason for the difference is unclear. Nutrient concentrations were similarly not detected.

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[2] Non-detect (ND) for dissolved iron and manganese would seem to indicate that they were oxidized by chlorine. Analysis for chlorine in the Ranney collector sample indicated that it was not present during the sampling. The City's WTP operator purged the water in the caisson before sampling during the dry event.

[3] The City referred the project team to OHA website for information on distribution system (finished water) monitoring results: (https://yourwater.oregon.gov/chemlatest.php?pwsno=00149).

Table 3A. Summary of Analytical Results from Post-fire Baseline Monitoring Events (January 30 and March 23, 2018)

	Units	MCL/ SMCL^	MRL	Mainstem		North Fork		Ranney collector	
				Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)
General									
Settleable Solids (SS)	ml/l	-	0.1	ND	ND	ND	ND	ND	ND
Total Suspended Solids (TSS)	mg/L	-	10	ND	ND	13	26	ND	ND
Total Dissolved Solids (TDS)	mg/L	500^	10	42	37	33	35	51	54
Total Hardness as $CaCO_3$	mg/L	-	3	19	23	22	13	28	30
Alkalinity in $CaCO_3$ units	mg/L	-	2	22	22	10	10	29	30
pH	Units	6-8.5	0.1	7.5	7.6	7.3	7.3	7.4	7.1
Total Organic Carbon	mg/L	-	0.3	0.37	0.85	0.62	1.4	ND	ND
Dissolved Organic Carbon	mg/L	-	0.3	0.46	0.9	0.57	1.3	ND	ND
Dissolved UV Abs. at 254 nm	cm -1	-	0.009	0.009	0.022*	0.0185	0.0535	ND	ND
Typical Ions									
Calcium, Dissolved	mg/L	-	1	4.1	3.6	3.2	3.1	7.9	8
Calcium, Total	mg/L	-	1	4.2	3.7	3.2	3.1	7.6	8.1
Potassium, Dissolved	mg/L	-	1	ND	ND	ND	ND	ND	ND
Potassium, Total	mg/L	-	1	ND	ND	ND	ND	ND	ND
Sodium, Dissolved	mg/L	-	1	1.7	1.3	3.2	2.7	4	3.8
Sodium, Total	mg/L	-	1	1.8	1.5	3.1	2.8	3.7	4
Chloride	mg/L	250^	1	1.6	1.2	3	2.5	3.7	3.6
Sulfate	mg/L	250^	0.5	1.6	1.1	1.6	1.5	3.2	2.4
Sulfur Total	mg/L	250^	1	0.54	0.45	0.56	0.56	1.1	0.94
Fluoride	mg/L	4	0.05	ND	ND	ND	ND	ND	ND
Nutrients									
Kjeldahl Nitrogen	mg/L	-	0.2	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N	mg/L	10	0.1	ND	ND	0.14	0.16	0.31	0.34
Total Nitrogen	mg/L	-	0.2	ND	ND	ND	ND	0.31	0.34
Ammonia Nitrogen	mg/L	-	0.05	ND	ND	ND	ND	ND	ND

Table 3A. Summary of Analytical Results from Post-fire Baseline Monitoring Events (January 30 and March 23, 2018)

	Units	MCL/ SMCL^	MRL	Mainstem		North Fork		Ranney collector	
				Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)
Nitrate as Nitrogen	mg/L	10	0.1	ND	ND	0.14	0.16	0.31	0.34
Nitrite as Nitrogen	mg/L	1	0.05	ND	ND	ND	ND	ND	ND
Total phosphorus as P	mg/L	-	0.02	0.02	0.03	ND	0.032	ND	ND
Orthophosphate as P	mg/L	-	0.01	0.019	0.034	0.012	0.034	ND	0.01
Metals									
Aluminum, Dissolved	ug/L	200^	20	ND	46	170	190	ND	ND
Aluminum, Total	ug/L	200^	20	190	**970**	**270**	**1400**	ND	ND
Barium, Dissolved	ug/L	-	2	8.2	6.4	17	14	33	34
Barium Total	ug/L	2,000	2	9.9	13	18	27	32	36
Iron, Dissolved	mg/L	0.3^	0.02	ND	0.053	0.12	0.15	ND	ND
Iron, Total	mg/L	0.3^	0.02	0.19	**0.75**	0.26	**1.6**	**0.83**	ND
Magnesium, Dissolved	mg/L	-	0.1	2.7	3	0.91	0.91	2.2	2.5
Magnesium, Total	mg/L	-	0.1	2.7	3.3	0.92	1.2	2.2	2.5
Manganese, Dissolved	ug/L	50^	2	ND	ND	5.9	4.6	ND	ND
Manganese, Total	ug/L	50^	2	4.9	18	6.3	32	14	ND
Mercury, Total	ug/L	2	0.2	ND	ND	ND	ND	ND	ND
Mercury, Dissolved	ug/L	2	0.2	ND	ND	ND	ND	ND	ND
Strontium, Dissolved	mg/L	-	0.01	0.042	0.036	0.042	0.041	0.084	0.086
Strontium, Total	mg/L	-	0.01	0.043	0.037	0.041	0.042	0.083	0.086
Microbial									
18-Hour E. Coli Confirmed (Large Wells)	PW	Treatment technique/ 0^	1	12	4*	1	25	ND	N/A
18-Hour E. Coli Confirmed (Small Wells)	PW		1	4	ND*	ND	9	ND	N/A
18-Hour Total Coliform Confirm (Large Wells)	PW		1	49	98*	49	49	ND	N/A
18-Hour Total Coliform Confirm (Small Wells)	PW		1	23	38*	22	35	ND	N/A
Cryptosporidium	oocysts/L		As shown	<0.091	<0.093*	<0.093	<0.093	<0.1	N/A
E. Coli Bacteria	MPN/100 mL		1	18	4*	1.0	47	<1	N/A

Table 3A. Summary of Analytical Results from Post-fire Baseline Monitoring Events (January 30 and March 23, 2018)

	Units	MCL/ SMCL^	MRL	Mainstem		North Fork		Ranney collector	
				Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)
Giardia	cysts/L		As shown	0.182	0.186*	<0.093	0.186	<0.1	N/A
Total Coliform Bacteria	MPN/100 mL		1	410	660*	390	820	<1	N/A

Notes:
* Results for sample collected on 3/22/18 for microbials from the mainstem of the Chetco River. Precipitation had just started by the time samples were collected on the mainstem Chetco River on March 22, 2018.
ug/L = microgram per liter
MCL = maximum contaminant level
mL = milliliter
MPN = most probable number
MRL – method reporting limit
N/A = not applicable (microbiological analyses were not included in the 3/23/18 Ranney collector sample to reduce costs. None of the analytes were reported in the previous sample from 1/30/18)
ND = not detected above method reporting limit
SMCL = secondary MCL
UV = ultraviolet

Table 3B. Summary of Physical (Field Parameter) Results from Post-fire Baseline Monitoring Events (January 30 and March 23, 2018)

	Units	Mainstem		North Fork		Ranney collector	
		Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)	Dry (01/30/18)	Wet (3/23/18)
Temperature	Celsius	10.50	9.86	10.11	8.26	10.90	10.37
Conductivity	µS/cm	32	46	43	31	63	70
Dissolved Oxygen	mg/L	10.65	10.18	10.09	12.54	10.36	5.89
pH	--	6.86	6.84	7.05	6.35	6.92	6.17
Oxygen Reduction Potential (ORP)	mV	105.6	135.1	149.7	144.1	548.6	137.1

Notes:
µS/cm =microsemen per centimeter
mg/L = milligrams per liter
mV = millivolts
-- = not applicable

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4. Water Supply and Treatment

Attachment C includes Stantec's report documenting its assessment of the potential water quality issues from the Chetco Bar Fire and implications on performance of the City's Ranney collector and WTP. Stantec's assessment included a review of current conditions and recent historical performance of the WTP and Ranney collector, including interviewing the WTP operator and conducting a site visit. The assessment also reviewed potential treatment modifications or upgrades and distribution system operational adjustments to address potential water quality changes as a result of the Chetco Bar Fire.

Daily water use in the City has ranged from 0.6 to 1.9 million gallons per day (mgd) over the past 6 years, with annual average usage ranging from 0.9 to 1.0 mgd. The City's 2-mgd WTP can provide a barrier against certain contaminants, such as turbidity and pathogens, but not all contaminants. The 40-year old WTP was operated daily through 2008, and has operated only a few weeks per year (on average) during the past few years, mainly to exercise equipment or as a safeguard when turbidity from the Ranney collector exceeds 0.1 nephelometric turbidity unit (NTU). It should be noted that OHA does not require the City to operate the WTP. However, because the WTP is a valuable asset, the City continues to maintain the WTP and keep it ready for operation if needed, including weekly backwashing of the multi-media filters.

Key Findings

The quality of the water pumped from the Ranney collector generally can be described as excellent. Stantec's review of available water quality data indicates:

- Alkalinity in water from the Ranney collector varies seasonally, generally ranging from 10 to 30 milligrams per liter (mg/L).
- Calculated total dissolved solids (TDS) historically have remained low (less than 100 mg/L) based on conductivity measurements, indicating that the Ranney collector is far enough upstream of the ocean to not be affected by high tides.
- In the latest round of required regulatory sampling, contaminants were not detected or the levels were well below regulatory concentration limits.
- During the past 5 years, DBP concentrations routinely have been at non-detect levels or well below regulatory limits.
- Taste and odor issues in the City's water supply are rare, and as such the WTP does not have taste and odor removal processes/equipment.

Possible Treatment Modifications

Based on a review of the potential water quality impacts from wildfires, Stantec identified several possible modifications to the WTP to provide improved treatment. These range from enhanced coagulation (changes in dosing) to adding variable frequency drives (VFD) for pumps at the Ranney collector and at the WTP to adding new treatment processes at the WTP, such as granular activated carbon (GAC) contactors or ultraviolet (UV) disinfection to address specific contaminants. Implementing these treatment modifications could take more than a year and costs could be in the millions of dollars, as shown in **Table 2 of Attachment D**. Selection and

prioritization of these modifications depends on the concentration and duration of the contaminants of concern from the fire's impacts.

Review of the two most-recent rounds of sampling yielded no quantifiable impacts. Moderate storm events occurred over the winter of 2017-2018 that resulted in turbid water. Based on conversations with City personnel, the observed water quality (turbidity, pH, and alkalinity) has not been statistically outside of the typical seasonal ranges. It does not appear that substantial sediment/organics migration or plugging of the Ranney collector has occurred.

Operational Modifications

Several operational modifications could be made separately or in combination to the existing WTP and Ranney collector to help mitigate water quality impacts, as follows:

- Keep WTP flows "lower and steadier" to increase sedimentation time and decrease filter loading rates. This may require the City to implement curtailment or conservation measures.
- Consider installing VFDs on the Ranney collector and WTP pumps to extend daily Ranney collector/WTP operations and reduce instantaneous pumping (longer and slower). The Ranney Collector and WTP pumps operate on a daily on-off cycle in response to a tank level, and depending on time of year, the pumps can go on and off multiple times per day
- Increase alum and polymer dosing in response to potential increased turbidities; additional caustic will be needed to adjust the pH.
- Increase chlorine dosing in response to potential increases in specific pathogens or as a pre-oxidant to select contaminants.

Each of these operational modifications has potentially negative impacts. For example, the chemical dosing options will result in higher chemical costs and increased solids handling; extended operations could affect labor costs and may require capital investment for VFDs; while curtailment could become a political and community concern. A proactive public relations and information campaign could help reduce these concerns or negative impacts.

5. Hydrology and Geomorphology

Attachment D is a TM prepared by Stillwater documenting their initial assessment of the Chetco Bar Fire's potential impacts to the hydrology and geomorphology of the Chetco River. This section summarizes the findings and recommendations from that assessment.

Stillwater conducted the assessment based upon a literature review, field reconnaissance, and professional experience in the region. The assessment considers the potential effects of the Chetco Bar Fire to rainfall-runoff dynamics, sediment-production (erosion) and sediment-delivery processes, and channel stability. The recently completed BAER report for the Chetco Bar Fire was an important resource for the assessment (USFS 2017a, b). Effects recorded by other researchers from two past wildfires, Silver Fire of 1987 and Biscuit Complex Fire of 2002, further informed Stillwater's assessment.

Key Findings

Under natural conditions, the combination of the Chetco River watershed's rugged physiography, high drainage density, and high rainfall associated with a Pacific marine climate results in high annual runoff and flashy short-duration peak flows, but low summer flows. The climate helps support a dense forest cover throughout much of the watershed, which is limited by underlying geology and limited urban developments.

The City's Ranney collector, near the North Fork confluence, lies along a reach of the Chetco River that is dominated by sediment deposition, where broad, coarse-grained gravel bars are periodically reworked laterally and vertically in response to annual high flows.

The watershed has experienced three large wildfires in recent decades (Silver in 1987, Biscuit Complex in 2002, and Chetco Bar in 2017) that have coincidently grown larger within the watershed boundaries with each new event. Wildfires have the potential to exacerbate runoff concentration and flashiness, soil erosion, turbidity concentrations (and other water quality constituents), and deposition in downstream areas. Observations made by other researchers following the older Silver and Biscuit Complex fires noted little occurrence of these processes.

Within the months since the Chetco Bar Fire, the few flushes of runoff through the watershed appear to have resulted in minor delivery of fine sediment and burned organics from some of the most heavily burned tributaries, such as Panther Creek, and limited, transient sediment-accumulation along larger gravel bars in depositional zones of the Chetco River, such as the Loeb State Park and North Fork gravel bars. Clear water was observed in nearly all inspected small and large tributary streams following the current water-year's largest storm and runoff event. The only noted occurrence of turbid-water runoff was from small streams draining burned areas with active salvage-logging.

Overall, the potential for post-fire hydro-geomorphic impacts to the City's Ranney collector through scour of the adjacent gravel bar and floodplain or deposition of fine sediments upon either surface appears low, based on the minimal post-fire changes observed to date. The stream power of the lower river appears sufficient under normal circumstances to flush-out any debris-laden flows to the ocean and limit excess sedimentation of fine particles in the lower river. The potential for post-fire effects to runoff, sediment-transport, and water quality may remain for several years until the vegetation cover has reestablished and stable soil layers have reformed in the burned areas.

The Ranney collector extends down to about 10–20 feet lower than the riverbed and is set back at least 100 feet laterally from the active river and gravel bar. The lateral intake screens are relatively short (~70 ft.), and do not extend under the river's gravel bar. With this configuration, water should have good travel time and filtration as it migrates to the Ranney collector's intake screens, and water quality should not noticeably change because of increased turbidity in the mainstem Chetco River flow. If the well were directly in the river, like the Ranney collector for the nearby community of Harbor, the saturated riverbed during times of increased turbidity may cause filtration effectiveness to decline. If the river stage increases or the active channel migrates closer to the Ranney collector, the effective setback of the Ranney collector decreases and the risk for possible water quality impacts at the collector increases.

Finally, Stillwater's geomorphology assessment noted that the Chetco River segment near the North Fork confluence exhibited significant lateral adjustment during the past 70 years, where

the active channel migrated across the entirety of the valley bottom, and the meander bend has shifted gradually closer toward the Ranney collector (see **Figure 9 of Attachment D**). The channel will continue to meander over the long term regardless of fire impacts, and the City will need to continue to monitor and assess channel conditions and Ranney collector performance in the long term.

6. Recommended Response Actions

Results from the limited baseline water quality sampling activities in 2018 have indicated minimal impacts to raw water quality from the Chetco Bar Fire to-date. It could take another year or two (coupled with heavy rain events) for more significant impacts to be observed. Based on the literature review on watershed response to major wildfires and the water quality monitoring and assessment conducted for this project, the project team recommends the following response activities:

- **Continued monitoring.** The City should continue monitoring efforts for at least 2 years, as outlined below, as a safeguard to help provide an early warning in case conditions change. The City may need to continue monitoring for a longer period if results indicate increases in observed concentrations.
    - To save costs, the City could continue water quality monitoring only for the mainstem Chetco River on a quarterly basis, with at least one additional rain event sample collected during the winter or early spring periods. If the results from a given sample indicate increased concentrations, then follow-up sampling can be conducted on the North Fork and from the Ranney collector. At a minimum, the following target parameters should be included: general parameters (TSS, TDS, alkalinity, pH); nutrients (nitrate/nitrite, phosphate); metals (aluminum, iron, manganese in total and dissolved form); microbial (total coliform, E. coli).
    - Watershed runoff should be monitored through routine review of river discharge recorded at the USGS gauge (14400000); this will enable the City to watch for large events that potentially may lead to geomorphic changes in the lower river. Further, while the assessment did not detect changes in runoff flashiness during the years following the watershed's two previous wildfire events, use of these or other runoff metrics could be employed again using USGS gauge data in the coming years to assess changes following the Chetco Bar Fire.
    - The photo monitoring points established in the assessment should be revisited by City personnel or its contractors to visually detect post-fire changes in river scour and/or deposition (see **Appendix A of Attachment D**). Photo monitoring may be best implemented during and/or soon after storm events.
    - If photo monitoring and/or water quantity/quality monitoring detect changes in the targeted metrics, more intensive monitoring is recommended, such as field-data collection and analytical modeling, to better assess and forecast near-term and long-term conditions (e.g., hydraulic and channel-change modeling could use the HEC-RAS model and sediment-transport models developed by USGS).

- **Coordination with agencies.** Future monitoring efforts should be coordinated with other entities, including the USFS BAER Team, ODFW, and DEQ. USFS continues to implement post-fire land management actions called out in its BAER report. ODFW continues to conduct biological monitoring throughout the watershed that may contain direct or indirect observations on aquatic habitat conditions, including channel-bed scour and sedimentation. DEQ recently began initial scoping and water-quality data collection efforts for a total maximum daily load (TMDL) plan for the Chetco River watershed. EPA recently listed the watershed as impaired by summer water temperatures (between River Mile [RM] 39.4 and RM 57.1), which limit beneficial uses of anadromous fish passage and salmonid fish rearing.

- **Water resiliency planning.** While baseline monitoring does not indicate immediate impacts or concerns from the Chetco Bar Fire, the City will continue to face the same water supply risks in the future. The City should invest in proactive planning to improve its water supply resiliency by conducting a formal vulnerability assessment. It can be included as part of the next Water System Master Plan update. The assessment would include explicit level of services adjustments (e.g., curtailment) for its water system that would result from various impaired water quality events, including integration of the WTP operational modifications identified by Stantec. The vulnerability assessment could be used as a basis to consider redundant source options (e.g., emergency wells) or to develop formal mutual aid agreements for shared supply (e.g., with the Harbor Utility District), and for outreach with utility customers and citizens.

- **Funding opportunities and grants.** The project team recognizes that the recommendations above require adequate funding. The City has an opportunity to leverage the high profile status of the Chetco Bar Fire to work with source protection organizations as well as local, state, and federal agencies to apply for grants and other funding sources. It was beyond the scope of this project to conduct detailed research on funding opportunities, but specific effort to identify and coordinate grant and funding opportunities may provide value. For example, the following website has information and tools to review federal funding programs: https://www.epa.gov/fedfunds/overview-federal-disaster-funding-opportunities-water-and-wastewater-utilities

References

USFS. 2017a. Chetco Bar Burned Area Emergency Response report. Prepared by the U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Available online at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd563154.pdf

USFS. 2017b. Chetco Bar BAER Specialists Reports. Prepared by the U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Available online at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd563197.pdf.

Attachment A – Sampling and Analysis Plan

Wildfire Source Water Protection Sampling and Analysis Plan

City of Brookings

January 16, 2018

Prepared for

City of Brookings

Prepared by

GSI Water Solutions, Inc.

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1 Introduction

Background

The City of Brookings' main source of water comes from the Chetco River Watershed, a mostly-forested area largely located on U.S. Forest Service (USFS) and Bureau of Land Management (BLM) lands. The City's raw water is collected through an infiltration gallery (also known as a "Ranney collector") located near the lower end of the Chetco River watershed at the confluence of the North Fork River and mainstem of the Chetco River. Though classified as a groundwater source, the City has the option to treat the water at its water treatment plant (WTP), or deliver it directly after disinfection (by chlorination) to its 8,000 citizens. The City has used the conventional rapid filtration plant during winter periods when high flows can bring in more turbid waters with reduced water quality.

In July-October 2017, the Chetco Bar Fire burned nearly 192,000 acres of the watershed. These acres are almost entirely within the City's source watershed upstream of the infiltration gallery. Both BLM and USFS recently completed assessments of the burn area, and identified major impacts with the potential for immediate and long-term increases in runoff flows, erosion, and water quality risks.

BLM and USFS assessments noted that the intensity of the burn can cause physical changes to the drainage characteristics of the soils, reducing infiltration and increasing runoff from the watershed. As pointed out by the USFS hydrologist, the increased runoff increases the risks of lateral and vertical channel scour from higher peak flow events. This could reduce the filtering capacity of the City's infiltration gallery, and expose it more directly to impacted water quality in the surface water. The loss of cover vegetation has also left this portion of the watershed vulnerable to erosion, creating a high potential for runoff to carry significantly greater quantities of silt and ash during heavy rain events.

The USFS assessment also noted major risks from water quality impacts of the fire, including an increased risk of turbidity, dissolved organic compounds, nutrients, and metals in water entering the infiltration gallery. Further, large quantities of aerial fire retardant (Phos-chek) were applied to combat the fire. The combined potential for channel scour exposing the infiltration gallery, and increased turbidity and poorer water quality could render it difficult for the City to adequately treat the water. The USFS assessment also noted the risk of forming elevated levels of disinfection by-products as a result of chlorinating water that has higher levels of dissolved organics.

Data Quality Objectives

The purpose of this sampling and monitoring plan (SMP) is to collect information to assess: (i) the potential risks to raw water quality and the ability of the City's WTP to adequately treat the raw water to meet drinking water criteria; and (ii) the potential impacts to the City's infiltration gallery in the form of channel scour or aggradation that may impact filtering capacity and performance of the Ranney collector. Data collected from this SMP is not intended for quantitative analysis or analytical modeling. The data will be used to develop early post-fire baseline information and to identify possible water quality and geomorphic trends. Information will also be used to conduct qualitative assessments to recommend additional monitoring, and planning or operational steps the City can take to mitigate potential impacts to their drinking water supply.

The data quality objectives (DQO) of the surface water sampling are to develop the qualitative basis for understanding:

- Potential changes in general water quality parameters that could require WTP operational changes (e.g. coagulant dosing, extended operations, sludge production);
- Potential changes in water quality parameters that could promote biological activity in the source water;
- Potential changes in water quality parameters that could affect aesthetics of drinking water.
- Potential changes in microbial activity that could affect changes to regulatory requirements for disinfection; and
- Presence of any chemicals associated with fire-fighting and fire-retardant used to combat the fire.

The DQOs for the geomorphic monitoring and observation are to develop baseline understanding of:

- Conditions of river morphology, including hydraulic geometry, sediment character, and channel stability; and
- Initial geomorphic responses of river morphology to the fire, including potential for channel scour and aggradation especially near the infiltration gallery.

2 Field Schedule and Sampling Summary

The field work described in this SMP will occur over three (3) sampling/monitoring events between January 29 and April 15, 2018. City staff will perform the field work. The consultant team will be present for the first event to assist with protocol and confirm the sampling and monitoring locations. Ideally the surface water sampling and geomorphology monitoring will occur concurrently, and occur on at least one day during a storm event and one day with no recent storm events. The goal is to capture water impacted by run-off and water not impacted by run-off in order to understand the impacts of the recent Chetco Bar Fire.

The sampling and monitoring events will be conducted approximately 6 weeks apart, as follows:

- Establish locations for and collect initial surface water samples and baseline flow monitoring and visual channel response observation in late-January 2018.
- Collect second surface water samples and flow monitoring and visual channel response observations in late-February 2018.
- Collect final surface water samples and flow monitoring and visual channel response observations in early April 2018.

Laboratory analyses will have a turn-around time of approximately 2 weeks.

3 Health and Safety

The field personnel conducting the work will ensure safe practices and operating conditions are maintained during the field investigation. Attachment B includes GSI's Health and Safety Plan and Checklist that will be followed by any consultant staff involved in activities described by this SMP. A safety briefing at the beginning of the field work will be performed by all staff (consultant and City) involved in activities associated with this SMP.

4 Surface Water Sampling

A total of 3 aggregate surface water samples will be collected during each sampling event. The location of these three grab samples are shown on Figure 1. Surface water sampling at the three locations will follow the protocol listed below:

1. Before starting sample collection, a multi-parameter meter will be calibrated to factory settings, with calibration results recorded on calibration forms. Calibration will occur daily. This field probe will measure all physical parameters including pH, turbidity, temperature, dissolved oxygen, conductivity, and oxygen reduction potential (ORP). Parameters will be recorded on the surface water Sampling form (Appendix A)
2. Location-dedicated tubing will be affixed to a metal/wooden rod and placement will be determined onsite. Site conditions will also determine tubing distance from mudline. Tubing will be held so that the opening faces upstream (into the flow of water) and will be connected to a peristaltic pump.
3. Carefully transfer the surface water into laboratory prepared bottles, as outlined in the analytical summary (Table 1). Take care to only place sampling equipment on a clean surface between filling laboratory prepared bottles. Samples will be placed on ice in a cooler after collection.
4. After all the laboratory bottles have been filled, fill the stainless steel container with surface water and place a quality parameter sensor (i.e., YSI 556 meter) inside. Monitor pH, temperature, conductivity, ORP, DO, and turbidity, and record readings as soon as they stabilize.

All non-dedicated equipment will be decontaminated per Section 8.

5 Sample Handling, Documentation, and Transport

Samples will be traceable from the time of collection through laboratory and data analysis. To ensure samples collected are traceable, the procedures described in this section will be followed.

5.1 Field Logbook and Forms

The field activities and observations will be noted in a field logbook or applicable field forms. The following site activity records will be documented:

- Sample information, including sample location, date/time of collection, type of sample, and description (only applicable when field form is not used);
- Any changes that occur at the Site (e.g., personnel, responsibilities, deviations from the SMP) and the reasons for such changes.

Field logbook and field forms entries will be written clearly with enough detail so that participants can reconstruct events later, if necessary. Unbiased, accurate language will be used and entries will be made while activities are in progress or as soon afterward as possible. Field logbook corrections will be made by drawing a single line through the original entry allowing the original entry to be legible. Corrections will be initialed and the corrected entry will be written alongside the original.

When field activities are complete, the field logbook will be retained in the project file at GSI's Portland, Oregon, office.

Field forms (e.g., surface water sampling form) will be completed for activities that are not described in the field logbook and kept in the project file at GSI's Portland, Oregon, office. Depending on the activity, the type of field data form, and the information recorded on it may vary. Sample field forms are provided in Appendix A.

5.2 Sample Containers, Preservation, and Holding Times

Surface water samples will be placed directly in the appropriate sample containers (Table 1). Sample containers and preservatives, as well as coolers and packing material, will be supplied by the laboratory. Commercially available pre-cleaned jars will be used and the laboratory will maintain a record of certification from the suppliers. Sample containers will be labeled clearly at the time of sampling. Labels will include the project name, sample ID, analysis to be performed, date, and time.

5.3 Sample Identification and Labeling

During sample collection, a unique code will be assigned to each sample as part of the data record. Station IDs are listed in Table 2. The first component of the sample ID will contain an abbreviation for the sample location followed by the month and year the sample was taken. Additional codes may be adopted, if necessary, to reflect sampling needs.

5.4 Chain-of-Custody Procedures

Samples are in custody if they are in the custodian's view, stored in a secure place with restricted access, or placed in a container secured with custody seals. A COC record will be signed by each person who has custody of the samples and will accompany the samples at all times. Copies of the COC will be included in contract laboratory reports and attached to the RI Report. When transferring sample custody, the COC will be signed, dated, and the time of transfer will be noted on the form.

The original COC form will be transported with the samples to the selected contract laboratories. Upon receipt, the laboratory sample custodian will inventory the samples by comparing sample labels to those on the COC document. The custodian will enter the sample number into a laboratory tracking system by project code and sample designation. The custodian will assign a unique laboratory number to each sample and will be responsible for distributing the samples to the appropriate analyst or for storing samples in an appropriate secure area.

The laboratories will maintain COC procedures internally and when samples are shipped to subcontracted laboratories or during shipment between laboratories.

5.5 Sample Packaging and Shipping

The laboratory will supply sample coolers and packing materials for each sampling event. Upon completion of the final sample inventory, samples will be packed in a cooler. Glass jars will be packed to prevent breakage and separated in the shipping container by bubble wrap or other shock-absorbent material. Ice in sealed plastic bags will be placed in the cooler to maintain a temperature of approximately 4 degrees Celsius (ºC). Alternatively, dry ice may be used to expedite cooling if recommended by the laboratory.

When the cooler is full, the COC form will be placed into a re-sealable bag and taped onto the inside lid of the cooler. A temperature blank will be added to each cooler. Coolers will be transported to

the contract laboratory by lab courier or overnight shipping service. These packaging and shipping procedures are in accordance with DOT regulations as specified in 49 CFR 173.6 and 49 CFR 173.24.

6 Investigation Derived Waste Management

No investigation derived waste is anticipated to be generated from these sampling and monitoring activities. All disposable materials used in sample collection and processing, such as paper towels and gloves, and other disposable supplies will be placed in a normal refuse container for disposal at a solid waste landfill.

7 Equipment Decontamination Procedures

Equipment that comes in direct contact with samples, such as flow meters and stainless steel containers, will be decontaminated in the following manner at the beginning of the sampling event, between use at each location, and at the end of the sampling event:

- Wash with brush and Liquinox or other phosphate-free detergent.
- Rinse with tap water.
- Rinse with deionized water.
- When dry, cover decontaminated equipment with aluminum foil for temporary storage and/or transport, if applicable.

To minimize sample contamination, gloves will be replaced after handling each sample, as appropriate.

8 References

ASTM. 2000. ASTM Standard D2488, 2000. Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). American Society for Testing and Materials, West Conshohocken, PA. D2488-00.

Ecology. 2004. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. Environmental Assessment Program. Washington Department of Ecology Publication No. 04-03-030, Rev. Pub. No. 01-03-003. July 2004.

EPA. 2002. Guidance on Environmental Data Verification and Validation. U.S. Environmental Protection Agency (EPA).

Figure and Tables

Figure 1: Proposed Sampling Locations

Table 1. Method Detection Limits, Container, Preservation and Holding Time Requirements

Wildfire Source Water Protection, Brookings, OR

Parameter [1]	MDL	Analytical Method	Container	Preservative	Holding Time
Ammonia Nitrogen	0.003	EPA 350.1	250 mL poly	0.5 mL H_2SO4	28 days
Calcium	0.118	EPA 200.7	500 mL acid poly	2 mL HNO3	180 days
Chloride	0.025	EPA 300.0	125 mL poly	--	28 days
Cryptosporidium/Giardia	0.025	EPA 1623	10 L cubitainer	--	96 hours
Cyanide	0.006	EM4500CN-F	250 mL poly	--	14 days
Dissolved Organic Carbon	0.020	SM 5310C	125 mL amber glass	--	28 days
E. Coli/Coliform	--	SM 9223B	100 mL poly sterilized	0.25 mL thio	2 days
Fluoride	0.007	SM 4500F-C	250 mL poly	--	28 days
Mercury	0.000424	EPA 245.1	500 mL acid poly	2 mL HNO3	28 days
Nitrate as N	0.005	EPA 300.0	125 mL	--	48 hour
Nitrate + Nitrite as N [2]	--	EPA 353-351	--	--	180 days
Nitrite as N	0.004	EPA 300.0	125 mL poly	--	48 hour
Ortho-Phosphorus	0.007	4500P-E/365.1	125 mL poly	--	2 day
Potassium	0.130	EPA 200.7	500 mL acid poly	2 mL HNO3	180 days
Sodium	0.113	EPA 200.7	500 mL acid poly	2 mL HNO3	180 days
Sulfate	0.060	EPA 300.0	125 mL poly	--	28 days
Total Alkalinity	0.834	SM 2330B	250 mL poly	--	14 days
Total/Dissolved Metals by ICP	[3]	EPA 200.7	500 mL acid poly	1 mL HNO3	180 days
Total/Dissolved Metals by ICP/MS	[4]	EPA 200.8	500 mL acid poly	1 mL HNO3	180 days
Total Dissolved Solids	4.224	E160.1/SM2540C	500 mL poly	--	7 days
Total Hardness [2]	3	SM 2340B	--	--	180 days
Total Kjeldahl Nitrogen	0.044	EPA 351.2	125 mL poly	0.5 mL H2SO4	28 days
Total Nitrogen [2]	--	--	--	--	180 days
Total Organic Carbon	0.042	SM5310C/E415.3	125 mL amber glass	0.5 mL H2SO4	28 days
Total Phosphorus	0.008	SM4500-PE/EPA 365.1	250 mL poly	0.5 mL H2SO4	28 days
Total Suspended Solids	4.441	SM 2540D	500 mL poly	--	28 days
Total Settable Solids	0.1 mL/L	SM 2540F	1L poly	--	2 days
UV absorbance at 253 nm	0.002 cm	SM 5910	125 mL amber glass	--	2 days

[1] Physical parameters including turbidity, conductivity, dissolved oxygen, and oxygen reduction potential (ORP) are not included in this list. These parameters will be measured using a multi-parameter probe and recorded on the Surface Water Sampling Form.

[2] Values calculated based on the results of other parameters

[3] Metals analyzed by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP) include Ca, Fe, Mg, K, Na, and S.

[4] Metals analyzed by Inductively Coupled Plasma Mass Spectrometry (ICP/MS) include Mn, Sr, Al, and Ba.

Table 2. Sample Label Protocol

Wildfire Source Water Protection, Brookings, OR

Location	Station ID	Sample ID	Number of Containers
Ranny Outlet	RO	RO_mmyy	27
North Fork	NF	NF_mmyy	27
Maintstem Chetco River	MSC	MSC_mmyy	27

Appendix A
Sampling Field Log and Field Forms

GSI
Water Solutions, Inc.

Daily Field Report

Name: **Signature:** **Date:**

55 SW Yamhill Street, Suite 300 Portland, OR 97204 P: 503.239.8799 F: 503.239.8940 info@gsiws.com www.gsiws.com

GSI Water Solutions, Inc.

PROJECT NUMBER	MONITORING LOCATION ID
	SHEET OF

Surface Water Quality Sampling

PROJECT : LOCATION :

SAMPLER(S) : DATE :

START TIME: END TIME :

Water Source: (Spring, Wetlands, Stream)

SAMPLE COLLECTION METHOD AND EQUIPMENT USED :

SAMPLE ID:

ANALYSES TO BE PERFORMED:

LABORATORY NAME:

SAMPLE DELIVERY/SHIPMENT METHOD:

NOTES / COMMENTS:

Time	pH (-)	Temperature (°C)	Electrical Conductivity (µS/cm)	Specific Conductance (µS/cm)	Turbidity (NTU)	DO (mg/L)		Remarks (color, clarity, odor, sheen, sediment, etc.)

Appendix B
Health and Safety Plan

GSI
Water Solutions, Inc.

Site-Specific Health and Safety Plan for Water Resources Sites

Introduction

This document is the GSI Health and Safety Plan (HSP) for a project that is not a HAZWOPER site. All other consultants, subconsultants, and subcontractors on the project will prepare their own HSPs and will be responsible for their own health and safety.

This HSP is intended for projects for which there is limited health and safety risk. It may be for projects that include:

- Water resources projects (drilling, well installation, pumping tests, etc.)
- Stormwater investigations
- Site visits where hazards are no greater than those to which the general public is exposed (e.g., ASR projects)

This HSP cannot be used for projects that include the following types of services or activities:

- Excavation
- Confined-space entry
- Exposure or potential exposure to hazardous waste or other toxic materials

Instructions

1. Complete this HSP.
2. Submit this HSP to GSI's Health and Safety Coordinator.
3. File the approved HSP in the project folder and in the Safety Committee's HSP folder at: General\GSI\Health and Safety\8_GSI Site-Specific Health and Safety Plans
4. Set up a short meeting with field personnel to walk through the HSP with the GSI Health and Safety Coordinator before field work begins.
5. Take a copy of this HSP on all visits to the project site.
6. The HSP should be on the dash of your vehicle and your vehicle should be parked so that a quick exit could be made from the site in the event of an emergency.
7. If changes are made, update the HSP and repeat steps 2, 3, and 4.

IMPORTANT: *All workers at the project site have "Stop Work Authority" to immediately stop work if they believe that a particular task is being performed unsafely. This authority may be exercised at any time by anyone working on the site without repercussions or retribution. If individuals observe hazards for which they are unprepared, they will withdraw from the area to reevaluate the task and develop appropriate safety precautions before proceeding. The GSI health and safety coordinator will be contacted to determine next steps and this HSP will be revised accordingly.*

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Site-Specific Health and Safety Plan
Chetco Bar Wildfire Source Water Protection
Brookings, OR

This Site-Specific Health and Safety Plan (HSP) has been developed in accordance with Occupational Safety and Health Act (OSHA) 29 CFR 1910 and 1926, and the GSI Water Solutions, Inc. (GSI), Health and Safety Policy. It covers known field hazards associated with the tasks necessary to complete the *Wildfire Source Water Protection Sampling and Analysis Plan.* All other consultants, subconsultants, and subcontractors will prepare their own HSP and will be responsible for their own health and safety. Any modifications to this HSP will be attached to this document.

Project Information

Date: 01/30/2018

GSI Project Number: 0347.004

Site/Project Name: Chetco Bar Wildfire Source Water Protection

Site Address/Location: Brookings, OR

Contact Information

GSI Project Manager: Ronan Igloria

Phone: 971-200-8510

Cell: 503-901-6897

GSI Health and Safety Coordinator: Andrew Davidson

Office Phone: 971-200-8535

Cell Phone: 773-817-4229

Client Contact: Gary Millman

Phone: 541-469-1101

Cell Phone:

Client Health and Safety Representative: N/A

Phone:

Cell Phone:

Will a Site Representative be Present during field work? *(yes or no)*

IN CASE OF LIFE-THREATENING INJURIES, CALL 911
USE AMBULANCE TO GO TO CLOSEST HOSPITAL

Emergency Contact	Name	Phone Number
Local Police	Brookings Police Department	**911 emergency**
Local Ambulance	Brookings Ambulance Service	**911 emergency**
Local Fire Department	Brookings Fire & Rescue	**911 emergency**
Local Hospital	Curry Medical Urgent Care	541-412-2000
Local Hospital Address	500 5th St, Brookings, OR 97415	
GSI Health and Safety Coordinator	Andrew Davidson	971-200-8535 and 773-817-4229

In the event of an occupational accident or incident, please indicate to the medical facility that this is a Workers' Compensation case; that your employer is GSI; and that the insurance administrator for Workers' Compensation claims is (**highlight one**):

- **For projects in Oregon**: SAIF Corporation
- **For projects in Washington**: Washington Department of Labor and Industries
- **For projects in California, Idaho, and Utah**: The Hartford

Directions to the Nearest Medical Facility

Curry Medical Urgent Care

99232 N Bank Chetco River Rd

Brookings, OR 97415

1. Head west on N Bank Chetco River Rd toward Coho Dr — 4.4 mi
2. Turn right onto Chetco Ave — 0.8 mi

Project Description

Project Description and Scope of Work: Collecting three grab samples from the Chetco river to assess water quality conditions following the Chetco Bar Fire. Field staff will be collecting samples from the banks of the river.

Project Location: Three different locations just east of downtown Brookings along N. Bank Chetco River road.

Access: Open with minor obstructions

Topography: River bank

Site Operations: No site operations

Table 1. Planned Site Activities		
Activity	**Location(s)**	**Date(s)**
Surface water sampling	Will be determined upon arrival	01/30/2018

Note: If planned scope of services changes from the descriptions above, a revised HSP must be developed.

Table 2. Locations of Nearest *(locate on the map on Page 3 and provide brief information in this table)*	
Telephone	GSI field personnel should keep fully charged cellular phones onsite. For remote sites or extended field days it is recommended a car charger or fully charged power block be available.
Water Source	GSI should carry water or identify the location of the nearest drinking water source.
Restroom	None available on-site

Table 3. Hazard Assessment		
Potential Hazards *(Provide additional details if these potential hazards may be encountered during the activities defined in Table 1.)*	**Identified Hazard** *(If yes, place an "x." If no, leave blank or delete the row.)*	**Description of Hazard and How to Avoid Hazard**
Vehicle Travel	x	Adhere to traffic regulations and speed limits, on and offsite. Move the vehicle to be close to the location of the sampling location, inspect the area for access, soft ground, obstacles that may damage the vehicle. If possible, drive in and drive out of the location, rather than reversing. If you need to reverse, use a spotter to guide you. Use chocks where needed.
Field Work Conducted Alone		GSI employees who conduct field work alone are encouraged to communicate with at least one coworker while in the field to ensure their safety. The Safety Committee suggests that employees who conduct routine field work alone carry fully a charged cell phone and discuss their plans and anticipated schedule with a coworker or their project manager before leaving for the field. Share information such as: • Where you are going • What you will be doing • Whether you will be alone • When you expect to return • When and how you will check in with them (via phone, text messaging, or email)
Heat Stress		Where possible, shift work hours to cooler times of the day. Allow frequent and adequate rest periods, adequate fluid intake, and monitor employees for signs of thermal stress. Wear clothing suitable for the current weather conditions. To avoid heat stress, cool potable water will be readily available, and site personnel will be encouraged to drink plenty of fluids and take periodic work breaks in hot weather.
Cold Stress/Hypothermia	x	Drink plenty of fluids (not caffeine); wear clothing appropriate for the weather conditions; wear multiple layers.
Slips/Trips/Falls	x	Maintain good housekeeping standards and avoid leaving items on the ground where they could present a trip hazard. Set up adequate staging areas for all equipment needed. Inspect work area and level ground surface where possible.
Unstable/Uneven Terrain/Steep Grades/Elevated Surfaces	x	If there is a potential for falls because of unstable, steep surface, the buddy system and additional safety precautions should be developed and discussed with GSI's Health and Safety Coordinator. Before field work, perform reconnaissance and develop a plan for safe ingress and egress. Wear sturdy work boots.
Machinery (welding, cutting, grinding, etc.)/ Mechanical Equipment/Heavy Equipment *(drill rig, backhoe, etc.)*		Stand clear of machinery that is in operation and be familiar with "emergency stop" devices, if applicable. No loose clothing to be worn and all long hair to be tied back. If safety vests are worn, they must be fastened at the front. Stay clear of hoisting operations (drill rod attachment and detachment). Be aware of all pinch points and provide guarding where possible. Be aware that heavy equipment activity may change daily or hourly, with differing potential hazards that need to be identified and addressed.

Table 3. Hazard Assessment		
Potential Hazards *(Provide additional details if these potential hazards may be encountered during the activities defined in Table 1.)*	**Identified Hazard** *(If yes, place an "x." If no, leave blank or delete the row.)*	**Description of Hazard and How to Avoid Hazard**
Lifting Hazards		Assess the load to be lifted, loaded, pushed, or pulled. Solicit help if the load cannot be safely moved by one person or if handling is too awkward. Lift with knees and hold load close to body. Make sure footing is firm, path is clear, and avoid twisting. Use same techniques when setting load down.
Hazardous Insects/Plants/Animals	x	Bees, snakes, spiders, and ticks. Avoid contact – seek medical attention if necessary. Wear insect repellant, as appropriate.
Electrical Hazards		Electrical equipment should be inspected to ensure it is in safe working order before use. Equipment should be grounded and operated under dry conditions.
Vehicular Traffic		Work will be conducted in close proximity to traffic. Traffic control will be provided by the drilling contractor. Personnel will be traffic-aware and will stay out of the street and curb to the extent practicable.
Overhead Hazards		• Look 'up' to determine location of hazard(s). If overhead hazards exist, change locations of the work to be performed where possible, otherwise, secure the overhead hazard(s) (e.g., de-energize live electrical lines). • Stand clear of drill rig and facility operations. Do not walk under a raised load or a load supported by a winch. Stand uphill from drilling activities (if possible) as falling drill strings may roll. Be aware of overhead activities during over-water work
Over Water/Near Water	x	The following precautions should be taken when conducting activities over water or near open bodies of water (e.g., rivers, streams, ponds): • GSI employees will wear U.S. Coast Guard-approved personal flotation devices (PFD) (i.e., life jacket or buoyant work vest) at all times when near water. Employees should inspect life jackets or work vests daily before use for defects. • There is a potential for a man-overboard situation while the team is working near or over water (boat, dock) and this potential is increased when heavy equipment is used or during stormy weather. If a person falls in water: o Boat engines will be stopped immediately. o Flotation devices (e.g., life rings) attached to lines will be thrown to the victim. o Victim then will be brought aboard the boat or towed to shore. o Wet clothes will be removed and replaced with dry blankets or clothing as necessary. o No other person will enter the water, except if the victim is unconscious or seriously injured. Rescuers must wear life preservers and be tethered to the boat or shore. At least one employee on the vessel will be trained in CPR and first aid.

Table 3. Hazard Assessment		
Potential Hazards *(Provide additional details if these potential hazards may be encountered during the activities defined in Table 1.)*	**Identified Hazard** *(If yes, place an "x." If no, leave blank or delete the row.)*	**Description of Hazard and How to Avoid Hazard**
Over Water/Near Water		• Ensure working platforms are secured with no tripping hazards; surfaces that become wet and slippery should be cleaned and dried to the extent possible; guard-rails and toe boards should be checked to ensure they are firmly fixed; life buoys fitted with lifelines should be provided and be ready for use at all times. • Employees will use extreme care when getting on and off the boats and docks, especially when carrying equipment or transferring samples.
Natural Disasters	x	Tsunami: When working in coastal areas, identify established tsunami evacuation routes and be aware of tsunami risk if an earthquake occurs. Cease operations, turn off equipment, follow the evacuation routes, and move to high ground as soon as possible. Earthquake: Cease operations and turn off equipment. Seek protection under a table or stay in the open. Before starting work again, inspect area and equipment.
Subsurface Utilities Call the Oregon Utility Notification Center "**One Call**" system at **811** or 1-800-332-2344 at lease 2 full business days before conducting subsurface work. http://www.digsafelyoregon.com/faqs.asp#1 For Washington locations, check : http://www.callbeforeyoudig.org/washington/		Check for location of underground services before beginning ground-penetrating work. OSHA regulations require the estimated location of utility installations (sewer, telephone, fuel, electric, water lines) or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined before opening an excavation. Use a service locator and the following cues to assist in identifying possible underground services: (1) signs of patching of pavements, (2) service boxes, pits, and manholes as they may indicate the presence or alignment of services, and (3) note services coming into or out of the ground, such as power lines and down spouts. When possible, shut off utilities that are in the area while drilling is taking place. Consider pot-holing using vac-truck/air-knife to a depth of 4 to 5 feet below surface for physical confirmation of absence/presence of utilities.
Excessive Noise		Have hearing plugs or sound-insulating headphones available. Wear hearing protection if you need to shout to be heard.
Gasoline/Diesel		• Do not add fuel to running motors or hot motors. • If gasoline, or other flammable material is being used, it must be transported in a U.S. Department of Transportation (DOT)-approved labeled container. Fuel should be transported, used, and stored a well-ventilated area away from heat or spark sources.
Fire		Sound an emergency alarm (continuous blast on a canned siren, vehicle horn, or direct oral communication) to notify nearby workers. Decide whether to call the Fire Department for outside assistance or to extinguish the fire with an accessible ABC fire extinguisher. Trained emergency crews will be summoned to control any large-scale or potentially unmanageable incident.

Table 3. Hazard Assessment		
Potential Hazards *(Provide additional details if these potential hazards may be encountered during the activities defined in Table 1.)*	**Identified Hazard** *(If yes, place an "x." If no, leave blank or delete the row.)*	**Description of Hazard and How to Avoid Hazard**
Wildfire Prevention and Suppression	x	■ Risk: Starting a fire within surrounding weeds, grasses, equipment and site debris. ■ Ignition sources: ▪ Equipment sparking/grinding ▪ Catalytic converters ▪ Welding equipment ▪ Electrical sources (generators, utilities) ▪ Smoking/tobacco products ■ Safety measures and fire suppression equipment during field operations: ▪ At the start of each day, review project area Fire Danger Level. ▪ Identify and remove/correct potential ignition sources within at least a 10-foot radius of work area. ▪ Maintain a shovel at the site. ▪ Maintain fire extinguishers onsite (e.g., drill rig, support truck). During daily tailgate safety meetings the location and accessibility of the fire extinguishers will be reviewed. ▪ If in area of high fire danger, maintain a minimum of 200 gallons of water on-site for fire suppression. ▪ Park vehicles equipped with a catalytic converter in areas cleared of vegetation. ▪ Wet vegetation within 10 feet of welding activities, if fire danger exists. ▪ When the Fire Danger Level is either high or very high/extreme, provide a "one hour fire watch" following the shutdown of drilling, well construction and/or testing equipment each day to look for signs of an accidental fire. ▪ Properly extinguish any fire/ignition source including tobacco products
Sharp Objects (e.g., nails, metal shards, glass, sharps)		Field staff should look for and scan the work area for the presence of sharp objects to avoid contact (stepping on, sitting on, etc.) and potential injury. Particular care should be taken in areas where debris is present. If sharps (e.g., nails) are present, steel shanked boots should be considered. If sharps are present, leather gloves should also be considered to avoid injury.
Inclement Weather *(ice, snow, lightning)*	x	Work will cease if precipitation severe enough to impair safe movement/travel, lightening in immediate area, excessive winds, flooding, or other conditions determined by the field manager or project manager.
UV Exposure	x	Wear appropriate clothing, hats, and sunscreen to prevent sunburn.
Oxygen Deficient	**This HSP cannot be used.**	
Other *(Describe)*		

Table 4. Personal Protective Equipment (PPE) to be Used *(Check all that apply)*	
Steel-toe boots	
Gloves	x
Eye/Face Protection	x
Hardhat	
Hearing Protection	
Clothing (cold weather gear, rain gear)	x
Respiratory Protection	
Additional Gear: brimmed hat, sunscreen	x
Poison oak protection and identification	x

Table 5. Safety Equipment *(Check all that apply)*	
First Aid Kit	**Required for all GSI field work**
Fire Extinguisher	Recommended on all jobs
Whistle/air horn	
Wheel chocks	
Flashlight or head lamp	
Other *(If applicable, provide list.)*	

Table 6. Training Requirements
(Check all that apply)

Type of Current Certificate	Yes	No	Trained GSI Employee(s)
HAZWOPER 40-Hour		X	
HAZWOPER 8-Hour Refresher		X	
First Aid/CPR/AED	X		**Required for all GSI field personnel.** First aid/CPR training is provided to allow employees to voluntarily administer first aid or medical assistance to family, friends, or coworkers as Good Samaritans. GSI employees are not required to administer first aid.

			GSI employees are required to immediately assess any emergency situation and seek professional assistance as appropriate.
CSTOP		X	

Table 7. GSI Field Staff		
Name	**Project Title**	**Responsibility**
Rodrigo Prugue	Staff Hydrogeologist	Field lead

All personnel requiring access to controlled work areas must have completed the appropriate training. Substitutions will be made with similarly qualified personnel; the Record of Change (ROC) must reflect all personnel changes.

Safe Work Practices

Personal Conduct

- Unauthorized personnel are not allowed on the project site.
- A high standard of personal hygiene will be observed. Smoking, eating, drinking, chewing gum or tobacco, taking medication, and applying cosmetics will not be permitted within work zones.
- Personnel under the obvious influence of alcohol or controlled substances are not allowed in the project area; those taking medications must notify the GSI's Health and Safety Coordinator.
- All project area personnel will familiarize themselves with these practices and the emergency procedures during daily tailgate and pre-work safety meetings.
- GSI employees who are passengers or drivers of vehicles will wear their seat belts any time the vehicle is in motion.
- Cellular phone use while driving is not permitted.

Equipment and Activities

- All unsafe conditions will be corrected immediately. All unsafe conditions not in the scope of the project will be reported to the field manager or project manager and the condition corrected.
- Loose-fitting clothing and loose long hair are prohibited near moving machinery.
- Do not fuel engines while the vehicle is running.
- Install adequate project area roads, signs, lights, and devices.
- Where portable electric tools and appliances can be used (where there is no potential for flammable or explosive conditions), they will be equipped only with 3-wire grounded power and

extension cords to prevent electrical shock. Use a ground fault circuit interrupter (GFCI) to prevent electrical shock.

- Store tools in clean, secure areas so they will not be damaged, lost, or stolen.
- Before exiting a vehicle, shift into park, set the parking brake, and shut off the engine. Never leave a running vehicle UNATTENDED.

Table 8. Project Subcontractors/Team Members
(Include contact information for others who will be working onsite.)

Company	Contact Information	Task
Glen Leverich	Stillwater science	Geomorphologist
Gary Millman	City of Brookings	Client
Ray Page	City of Brookings	Client

Work Limitations *(e.g., 7 a.m. to sunset, Monday through Friday, excluding holidays):*

Daily Tailgate Safety Meetings

Tailgate safety meetings will be conducted by the field manager each day or for all major changes of work tasks or conditions. Topics of discussion will include work tasks and designated PPE, emergency procedures, evacuation routes, instruction in use of safety equipment (as required), prior safety problems, etc. These meetings must be documented in the field notebook or Tailgate Safety Meeting Checklist.

Visitor Access

All project area visitors (except OSHA inspectors) must receive prior approval from the field manager, project manager, and client, and may do so only for the purposes of observing project area conditions or operations.

Table 9. Signatures for Health and Safety Plan

This signature indicates that the project manager is aware of the potential hazards at this site, has reviewed this HSP, and will communicate these hazards and appropriate controls to GSI employees before they travel to and initiate work at the project site.

	Name (Printed)	Signature	Date
Prepared by	Rodrigo Prugue		01/16/2018
Reviewed by	Andrew Davidson		01/16/2018

Project Manager	Ronan Igloria		

Table 10. GSI Employee Health And Safety Plan Acceptance

I have had access to the HSP and opportunity to ask questions about this HSP. I have received site-specific information and orientation regarding the identified hazards anticipated at the project site. My signature certifies that I understand the procedures, equipment, and restrictions of this HSP and agree to abide by them.

Signature	Name (Printed)	Date

If a coworker is injured, these are the steps to take:

1. **Provide or get medical help immediately.** GSI employees are required to immediately assess any emergency situation and seek professional assistance as appropriate. All work-related injuries or illnesses must be reported promptly to the field safety officer, the project manager, and the Safety Committee. The field safety officer will make an assessment of the injury and take the appropriate action in accordance with GSI's Emergency Medical Plan:

    - **First aid treatment.** If the injury requires only first aid, the employee or another first-aid-trained person may administer aid using the job site first aid kit or the injured person may be transported to an immediate care center or doctor's office for treatment.
    - **Medical treatment other than first aid.** If the injured person requires more than first aid treatment, but it is not an emergency, the injured person will be driven to a hospital or immediate care center. A map to the nearest medical facility is provided in the GSI site-specific Health and Safety Plan (HSP).
    - **Serious or life-threatening injuries.** If the injured person has a serious or life-threatening injury, employees are to dial 911. The injured person must not be moved unless it is absolutely necessary, and should be moved or transported only by paramedics or rescue personnel.

2. **Note the date and time of the accident.** Write this information on the HSP.

3. **Do not move equipment.** If there has been a fatality or three or more people are injured, do not move any equipment at the job site, except to remove victims or to prevent further injury.

4. **Go to the hospital with the injured employee, if possible.** Remain with the injured employee until you contact a member of the Safety Committee.

5. **Contact a member of GSI's Safety Committee.** Members of the Safety Committee are the main point of contact during an accident or incident. They will reach the employee's emergency contacts and inform GSI managers.

GSI Safety Committee Members

- **Nancy Steensma**
  Work: 503-239-8799, ext. 101
  Cell: 503-980-5706
- **Owen McMurtrey**
  Work: 541-257-9005
  Cell: 541-740-5619
- **Jill Carroll**
  Work: 971-200-8524
  Cell: 503-329-4343
- **Andrew Davidson**
  Work: 971-200-8535
  Cell: 773-817-4229
- **Liesl Deck**
  Work: 971-200-8506
  Cell: 503-730-4533
- **Brian Franz**
  Work: 805-979-3082
  Cell: 805-453-8267

Attachment B – Historical Water Quality Data

Samples Collected from Chetco River below Jack Creek
Data from Oregon Department of Environmental Quality Statewide Toxics Monitoring Program

Analyte	4/22/13 - Result	8/5/13 - Result	10/28/13 - Result	*MRL*	Units
Arsenic, Dissolved	ND	0.26	ND	*0.25*	µg/L
Arsenic, Total inorganic	0.151	0.200	0.164	*0.040*	µg/L
Arsenic, Total recoverable	ND	0.27	ND	*0.25*	µg/L
Calcium, Dissolved	5.83	10.1	8.64	*0.20*	mg/L
Calcium, Total recoverable	5.88	9.88	8.70	*0.20*	mg/L
Chloride	no sample	2.06	2.05	*0.50*	mg/L
Conductivity	61	101	86	*1*	µmhos/cm
Copper, Dissolved	51.9	ND	ND	*1.50*	µg/L
Copper, Total recoverable	ND	ND	ND	*1.50*	µg/L
Dissolved Oxygen	10.9	9.6	10.4	*1.0*	mg/L
Dissolved Oxygen, Saturation	102	105	95	*1*	%
DOC	ND*	ND*	1.6	*1.0*	mg/l
Hardness as CaCO3, Dissolved	26.5	43.0	37.5	*0.75*	mg/L
Hardness as CaCO3, Total recoverable	26.6	42.1	38.0	*0.75*	mg/L
Iron, Dissolved	ND	ND	ND	*150*	µg/L
Iron, Total recoverable	ND	ND	ND	*150*	µg/L
Lead, Dissolved	ND	ND	ND	*0.20*	µg/L
Lead, Total recoverable	ND	ND	ND	*0.20*	µg/L
Magnesium, Dissolved	2.90	4.32	3.87	*0.05*	mg/L
Magnesium, Total recoverable	2.88	4.24	3.94	*0.05*	mg/L
Manganese, Dissolved	ND	ND	ND	*2.00*	µg/L
Manganese, Total recoverable	2.23	ND	ND	*2.00*	µg/L
Nickel, Dissolved	ND	ND	ND	*1.00*	µg/L
Nickel, Total recoverable	1.02	ND	ND	*1.00*	µg/L
Nitrate/Nitrite as N	0.0173	0.0058	0.0075	*0.0050*	mg/L
pH	7.7	7.9	7.5	*0.1*	pH Units
Phosphate, Total as P	0.01	0.01	ND	*0.01*	mg/L
Potassium, Dissolved	0.25	0.36	0.28	*0.20*	mg/L
Potassium, Total recoverable	0.25	0.36	0.28	*0.20*	mg/L
Selenium, Dissolved	ND	ND	ND	*2.00*	µg/L
Selenium, Total recoverable	ND	ND	ND	*2.00*	µg/L
Silver, Dissolved	ND	ND	ND	*0.10*	µg/L
Silver, Total recoverable	ND	ND	ND	*0.10*	µg/L
Sodium, Dissolved	2.21	2.86	2.60	*0.10*	mg/L
Sodium, Total recoverable	2.15	2.80	2.66	*0.10*	mg/L
Sulfate	2.37	3.85	3.86	*0.20*	mg/L
Temperature	12.7	19.7	11.3	*0.0*	°C
TOC (Total Organic Carbon)	ND*	ND*	ND*	*1.0*	mg/l
Total Solids	38.0	63.0	61.0	*10.0*	mg/L
Total Suspended Solids	ND	ND	ND	*1*	mg/L
Turbidity	1	1	ND	*1*	NTU
Zinc, Dissolved	ND	ND	ND	*5.00*	µg/L
Zinc, Total recoverable	ND	ND	ND	*5.00*	µg/L

Analytical Report

Drinking Water Source Monitoring

South Coast Source Water Fire Response Sampling

Sampling Event: 1709137

Report to: Aaron Borisenko

State of Oregon
Department of Environmental Quality

Laboratory and Environmental Assessment Program

7202 NE Evergreen Parkway
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Hillsboro, OR 97124-6536

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www.oregon.gov/DEQ

DEQ is a leader in restoring maintaining and enhancing the quality of Oregon's air, land and water.

The results contained in this report relate only to the items tested. The data in this report was reviewed for technical accuracy in the applicable departments.The signatory below has reviewed the report for completeness and has approved it for final release.

Sarah Rockwell
Laboratory Project Manager

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137 South Coast Source Water Fire Response Sampling

Narrative

The official signed report is retained on file by the laboratory. All unsigned and electronic copies of this report are unofficial copies of the official document. The title page of the report bears the name of the primary document recipient. Questions as to the integrity of the data contained in this report should be directed first to the report's primary recipient and second to the laboratory. The laboratory maintains all raw data and records from which this report has been generated for a period of no less than five years. Additional electronic and/or printed copies of this report can be obtained by contacting the laboratory.

The DEQ Laboratory employs in its operations standard analytical methods that have been adopted by governing agencies for their specific application to sample matrices and regulatory programs of interest. In cases where standard analytical methods have not been promulgated, the laboratory has developed "in-house" methods which are consistent with best laboratory operating practices that will result in data of a quality appropriate for the intended use of information. Furthermore, all data has been scrutinized for adherence to established Quality Assurance /Quality Control (QA/QC) guidelines. Unless otherwise noted, the information contained in this report meets all the aforementioned requirements as documented in the laboratory's Quality Assurance Manual and Standard Operating Procedures. Specific deviations from these requirements are noted, as appropriate, in this report. Questions or concerns regarding the contents of this report can be addressed by contacting the DEQ laboratory.

General Considerations

The analytical data contained in this report was generated to satisfy specific data quality objectives for the programs and projects under which they were generated. Users of the data must be able to understand potential limitations of the information and its suitability for their intended use. In cases where a portion of the sample analyses were analyzed by organizations other than DEQ, the review of this data was limited to information supplied by the non-DEQ organization.

Data Qualification

All laboratory batch quality control (QC) sample results associated with the samples are contained in this report. Any QC sample that does not meet the specified criteria will be flagged with a "QC" qualifier. Specific sample results associated with a QC parameter that did not meet criteria with a data quality level (DQL) other than "A" have been qualified in the laboratory report to assist in the evaluating the limitations of the data. Certain QC exceedances do not necessarily warrant a change to the DQL as the reported value is not adversely impacted. In these cases, the sample results associated with the QC receive no further qualification.

Some examples of this are:

1) Non-detected results with QC exceedances that indicate a high bias.
2) Blank results indicate slight contamination from field or laboratory activities however the target analyte in the sample is present in significantly high concentrations relative to the blank.
3) Blank results indicate slight contamination from field or laboratory activities however the target analyte is not detected in the sample.
4) Duplicate sample results where the sample concentrations are sufficiently low (< 5x the LOQ) to affect the applicability of the RPD limits.
5) Matrix spike results where the source sample concentration is sufficiently higher than the spike amount to affect the applicability of the spike recovery calculation.

Field Quality Control

Where applicable, field quality control (blanks and duplicate) samples should be reviewed for their potential impact on the samples in a sampling event, or multiple sampling events, involved for a project. See DEQ09-LAB-0006-QAG for more information.

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137 South Coast Source Water Fire Response Sampling

Sampling Event Summary

Client: Drinking Water Source Monitoring

Project: South Coast Source Water Fire Response Sampling

Qtime #: 45513

Sampled by: DEQ

ID #	Type:	Station #:	Description:	Matrix:	Sample Date Time
1709137-01	GS	38949	Chetco River 70 m SW of Brookings ranney collector	River/Stream	26-Sep-2017 11:45
1709137-02	GS	38950	Gold Beach raw water treatment plant, south bank of Rogue River spigot access	River/Stream	26-Sep-2017 14:05
1709137-03	FP	38948	Chetco River 100 m DS of Harbor ranney collector	River/Stream	26-Sep-2017 9:50
1709137-04	EB	10000	Blank - Equipment	Reagent Water	26-Sep-2017 14:42
1709137-05	FD	38948	Chetco River 100 m DS of Harbor ranney collector	River/Stream	26-Sep-2017 9:51

Key to Sample Type

EB = Blank - Equipment

FD = Field Duplicate

FP = Field Primary

GS = Grab Sample

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137 South Coast Source Water Fire Response Sampling

Sample Data

1709137-01 *(River/Stream)* Station: 38949

Description: Chetco River 70 m SW of Brookings ranney collector

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method	Qualifiers
General Field Parameters									
Conductivity	**114**	1	µmhos/cm	1	B17J085	26-Sep-17 11:45	26-Sep-17 11:45	*SM 2510 B*	
Dissolved Oxygen	**10.2**	1.0	mg/L	1	B17J085	26-Sep-17 11:45	26-Sep-17 11:45	*SM 4500-O C*	
Dissolved Oxygen, Saturation	**118**	1	%	1	B17J085	26-Sep-17 11:45	26-Sep-17 11:45	*SM 4500-O G*	
pH	**8.3**	0.1	pH Units	1	B17J085	26-Sep-17 11:45	26-Sep-17 11:45	*SM 4500-H+ B*	
Temperature	**21.0**	-10.0	°C	1	B17J085	26-Sep-17 11:45	26-Sep-17 11:45	*EPA 170.1*	
Turbidity	ND	1	NTU	1	B17J085	26-Sep-17 11:45	26-Sep-17 11:45	*SM 2130 B*	
General Chemistry									
Cyanide, Total	ND	0.010	mg/L	1	B17J048	06-Oct-17 08:11	06-Oct-17 12:17	*SM 4500-CN⁻ E*	
Nutrients									
Ammonia as N	ND	0.010	mg/L	1	B17I263	27-Sep-17 23:04	27-Sep-17 23:04	*ASTM D6919-09*	
Nitrate/Nitrite as N	ND	0.0050	mg/L	1	B17J050	06-Oct-17 14:02	06-Oct-17 14:02	*SM 4500-NO3⁻ F*	
Phosphate, Total as P	ND	0.01	mg/L	1	B17J002	02-Oct-17 07:29	03-Oct-17 09:10	*SM 4500-P E*	

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Qualifiers
Total Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Total recoverable	ND	50.0	µg/L	1	B17I266	28-Sep-17	29-Sep-17	
Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Dissolved	ND	50.0	µg/L	1	B17I265	28-Sep-17	29-Sep-17	

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137 South Coast Source Water Fire Response Sampling

Sample Data

1709137-02 *(River/Stream)* Station: 38950

Description: Gold Beach raw water treatment plant, south bank of Rogue River spigot access

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method	Qualifiers
General Field Parameters									
Conductivity	**113**	1	µmhos/cm	1	B17J085	26-Sep-17 14:05	26-Sep-17 14:05	*SM 2510 B*	
Dissolved Oxygen	**8.0**	1.0	mg/L	1	B17J085	26-Sep-17 14:05	26-Sep-17 14:05	*SM 4500-O C*	
Dissolved Oxygen, Saturation	**92**	1	%	1	B17J085	26-Sep-17 14:05	26-Sep-17 14:05	*SM 4500-O G*	
pH	**7.5**	0.1	pH Units	1	B17J085	26-Sep-17 14:05	26-Sep-17 14:05	*SM 4500-H+ B*	
Temperature	**19.9**	-10.0	°C	1	B17J085	26-Sep-17 14:05	26-Sep-17 14:05	*EPA 170.1*	
Turbidity	ND	1	NTU	1	B17J085	26-Sep-17 14:05	26-Sep-17 14:05	*SM 2130 B*	
General Chemistry									
Cyanide, Total	ND	0.010	mg/L	1	B17J048	06-Oct-17 08:11	06-Oct-17 12:17	*SM 4500-CN⁻ E*	
Nutrients									
Ammonia as N	ND	0.010	mg/L	1	B17I263	28-Sep-17 00:22	28-Sep-17 00:22	*ASTM D6919-09*	
Nitrate/Nitrite as N	**0.118**	0.0050	mg/L	1	B17J050	06-Oct-17 14:03	06-Oct-17 14:03	*SM 4500-NO3⁻ F*	
Phosphate, Total as P	**0.04**	0.01	mg/L	1	B17J002	02-Oct-17 07:29	03-Oct-17 09:10	*SM 4500-P E*	

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Qualifiers
Total Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Total recoverable	ND	50.0	µg/L	1	B17I266	28-Sep-17	29-Sep-17	
Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Dissolved	ND	50.0	µg/L	1	B17I265	28-Sep-17	29-Sep-17	

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137 South Coast Source Water Fire Response Sampling

Sample Data

1709137-03 *(River/Stream)* Station: 38948

Description: Chetco River 100 m DS of Harbor ranney collector

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method	Qualifiers
General Field Parameters									
Conductivity	**107**	1	µmhos/cm	1	B17J085	26-Sep-17 09:50	26-Sep-17 09:50	*SM 2510 B*	
Dissolved Oxygen	**9.9**	1.0	mg/L	1	B17J085	26-Sep-17 09:50	26-Sep-17 09:50	*SM 4500-O C*	
Dissolved Oxygen, Saturation	**106**	1	%	1	B17J085	26-Sep-17 09:50	26-Sep-17 09:50	*SM 4500-O G*	
pH	**7.4**	0.1	pH Units	1	B17J085	26-Sep-17 09:50	26-Sep-17 09:50	*SM 4500-H+ B*	
Temperature	**18.2**	-10.0	°C	1	B17J085	26-Sep-17 09:50	26-Sep-17 09:50	*EPA 170.1*	
Turbidity	ND	1	NTU	1	B17J085	26-Sep-17 09:50	26-Sep-17 09:50	*SM 2130 B*	
General Chemistry									
Cyanide, Total	ND	0.010	mg/L	1	B17J048	06-Oct-17 08:11	06-Oct-17 12:17	*SM 4500-CN⁻ E*	
Nutrients									
Ammonia as N	ND	0.010	mg/L	1	B17I263	28-Sep-17 01:41	28-Sep-17 01:41	*ASTM D6919-09*	
Nitrate/Nitrite as N	ND	0.0050	mg/L	1	B17J050	06-Oct-17 14:04	06-Oct-17 14:04	*SM 4500-NO3⁻ F*	
Phosphate, Total as P	ND	0.01	mg/L	1	B17J002	02-Oct-17 07:29	03-Oct-17 09:10	*SM 4500-P E*	

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Qualifiers
Total Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Total recoverable	ND	50.0	µg/L	1	B17I266	28-Sep-17	29-Sep-17	
Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Dissolved	ND	50.0	µg/L	1	B17I265	28-Sep-17	29-Sep-17	

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137 South Coast Source Water Fire Response Sampling

Sample Data

1709137-04 *(Reagent Water)* Station: 10000
Description: Blank - Equipment::EB

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method	Qualifiers
General Field Parameters									
Conductivity	**1**	1	µmhos/cm	1	B17J085	26-Sep-17 14:42	26-Sep-17 14:42	*SM 2510 B*	
Dissolved Oxygen	**8.6**	1.0	mg/L	1	B17J085	26-Sep-17 14:42	26-Sep-17 14:42	*SM 4500-O C*	
Dissolved Oxygen, Saturation	**108**	1	%	1	B17J085	26-Sep-17 14:42	26-Sep-17 14:42	*SM 4500-O G*	
pH	**6.0**	0.1	pH Units	1	B17J085	26-Sep-17 14:42	26-Sep-17 14:42	*SM 4500-H+ B*	
Temperature	**25.9**	-10.0	°C	1	B17J085	26-Sep-17 14:42	26-Sep-17 14:42	*EPA 170.1*	
Turbidity	ND	1	NTU	1	B17J085	26-Sep-17 14:42	26-Sep-17 14:42	*SM 2130 B*	
General Chemistry									
Cyanide, Total	ND	0.010	mg/L	1	B17J048	06-Oct-17 08:11	06-Oct-17 12:17	*SM 4500-CN⁻ E*	
Nutrients									
Ammonia as N	ND	0.010	mg/L	1	B17I263	28-Sep-17 02:20	28-Sep-17 02:20	*ASTM D6919-09*	
Nitrate/Nitrite as N	ND	0.0050	mg/L	1	B17J050	06-Oct-17 14:04	06-Oct-17 14:04	*SM 4500-NO3⁻ F*	
Phosphate, Total as P	ND	0.01	mg/L	1	B17J002	02-Oct-17 07:29	03-Oct-17 09:10	*SM 4500-P E*	

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Qualifiers
Total Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Total recoverable	ND	50.0	µg/L	1	B17I266	28-Sep-17	29-Sep-17	
Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Dissolved	ND	50.0	µg/L	1	B17I265	28-Sep-17	29-Sep-17	

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137 South Coast Source Water Fire Response Sampling

Sample Data

1709137-05 *(River/Stream)* Station: 38948

Description: Chetco River 100 m DS of Harbor ranney collector

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method	Qualifiers
General Field Parameters									
Conductivity	**119**	1	µmhos/cm	1	B17J085	26-Sep-17 09:51	26-Sep-17 09:51	*SM 2510 B*	
Dissolved Oxygen	**9.4**	1.0	mg/L	1	B17J085	26-Sep-17 09:51	26-Sep-17 09:51	*SM 4500-O C*	
Dissolved Oxygen, Saturation	**110**	1	%	1	B17J085	26-Sep-17 09:51	26-Sep-17 09:51	*SM 4500-O G*	
pH	**7.8**	0.1	pH Units	1	B17J085	26-Sep-17 09:51	26-Sep-17 09:51	*SM 4500-H+ B*	
Temperature	**21.2**	-10.0	°C	1	B17J085	26-Sep-17 09:51	26-Sep-17 09:51	*EPA 170.1*	
Turbidity	ND	1	NTU	1	B17J085	26-Sep-17 09:51	26-Sep-17 09:51	*SM 2130 B*	
General Chemistry									
Cyanide, Total	ND	0.010	mg/L	1	B17J048	06-Oct-17 08:11	06-Oct-17 12:17	*SM 4500-CN⁻ E*	
Nutrients									
Ammonia as N	ND	0.010	mg/L	1	B17I263	28-Sep-17 02:59	28-Sep-17 02:59	*ASTM D6919-09*	
Nitrate/Nitrite as N	ND	0.0050	mg/L	1	B17J050	06-Oct-17 14:05	06-Oct-17 14:05	*SM 4500-NO3⁻ F*	
Phosphate, Total as P	ND	0.01	mg/L	1	B17J002	02-Oct-17 07:29	03-Oct-17 09:10	*SM 4500-P E*	

Analyte	Result	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Qualifiers
Total Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Total recoverable	ND	50.0	µg/L	1	B17I266	28-Sep-17	29-Sep-17	
Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry							**EPA 200.8**	
Iron, Dissolved	ND	50.0	µg/L	1	B17I265	28-Sep-17	29-Sep-17	

Laboratory Quality Control Data

General Chemistry

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B17J048 - Cyanide 4500 CN- C Prep										
Blank (B17J048-BLK1)				Prepared & Analyzed: 06-Oct-17						
Cyanide, Total	ND	0.010	mg/L							
LCS (B17J048-BS1)				Prepared & Analyzed: 06-Oct-17						
Cyanide, Total	0.099	0.010	mg/L	0.100		99	85-115			
Duplicate (B17J048-DUP1)		Source: 1709137-05		Prepared & Analyzed: 06-Oct-17						
Cyanide, Total	ND	0.010	mg/L		ND				20	
Matrix Spike (B17J048-MS1)		Source: 1709137-05		Prepared & Analyzed: 06-Oct-17						
Cyanide, Total	0.097	0.010	mg/L	0.100	ND	97	75-125			

Laboratory Quality Control Data

Nutrients

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B17I263 - No Prep-Non-Metals										
Blank (B17I263-BLK1)				Prepared & Analyzed: 27-Sep-17						
Ammonia as N	ND	0.010	mg/L							
LCS (B17I263-BS1)				Prepared & Analyzed: 27-Sep-17						
Ammonia as N	0.101		mg/L	0.0990		102	90-110			
Duplicate (B17I263-DUP1)		Source: 1709137-02		Prepared & Analyzed: 28-Sep-17						
Ammonia as N	ND	0.010	mg/L		ND				20	
Matrix Spike (B17I263-MS1)		Source: 1709137-01		Prepared & Analyzed: 27-Sep-17						
Ammonia as N	0.091		mg/L	0.0990	0.00	92	80-120			
Batch B17J050 - No Prep-Non-Metals										
Blank (B17J050-BLK1)				Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	ND	0.0050	mg/L							
LCS (B17J050-BS1)				Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	4.06		mg/L	4.00		102	90-110			
LCS (B17J050-BS2)				Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	0.101		mg/L	0.100		101	90-110			
Duplicate (B17J050-DUP1)		Source: 1709104-02		Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	0.0579	0.0050	mg/L		0.0578			0.2	10	
Duplicate (B17J050-DUP2)		Source: 1709128-05		Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	0.0286	0.0050	mg/L		0.0286			0.1	10	
Matrix Spike (B17J050-MS1)		Source: 1709129-01		Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	2.22		mg/L	0.990	1.19	104	80-120			
Matrix Spike (B17J050-MS2)		Source: 1709128-02		Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	0.0886		mg/L	0.0792	0.0101	99	80-120			
Matrix Spike (B17J050-MS3)		Source: 1709137-02		Prepared & Analyzed: 06-Oct-17						
Nitrate/Nitrite as N	0.195		mg/L	0.0792	0.116	99	80-120			
Batch B17J002 - TP Digestion										
Blank (B17J002-BLK1)				Prepared: 02-Oct-17 Analyzed: 03-Oct-17						
Phosphate, Total as P	ND	0.01	mg/L							
LCS (B17J002-BS1)				Prepared: 02-Oct-17 Analyzed: 03-Oct-17						
Phosphate, Total as P	0.32		mg/L	0.300		107	90-110			
Duplicate (B17J002-DUP1)		Source: 1709056-01		Prepared: 02-Oct-17 Analyzed: 03-Oct-17						
Phosphate, Total as P	0.03	0.01	mg/L		0.03			6	10	

DEQ Laboratory and Environmental Assessment Program

Analytical Report

Sampling Event: 1709137

Laboratory Quality Control Data

Nutrients

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B17J002 - TP Digestion										
Matrix Spike (B17J002-MS1)		**Source: 1709057-05**		Prepared: 02-Oct-17 Analyzed: 03-Oct-17						
Phosphate, Total as P	0.13	0.01	mg/L	0.120	0.01	101	80-120			

Laboratory Quality Control Data

Total Metals by Inductively Coupled Plasma Mass Spectrometry

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B17I266 - Digestion by 200.8										
Blank (B17I266-BLK1)				Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Total recoverable	ND	50.0	µg/L							
LCS (B17I266-BS1)				Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Total recoverable	5130	50.0	µg/L	5000		103	85-115			
Matrix Spike (B17I266-MS1)		Source: 1709092-02		Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Total recoverable	5130	50.0	µg/L	5000	ND	103	70-130			
Matrix Spike Dup (B17I266-MSD1)		Source: 1709092-02		Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Total recoverable	5130	50.0	µg/L	5000	ND	103	70-130	0.1	20	

Laboratory Quality Control Data

Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B17I265 - Digestion by 200.8										
Blank (B17I265-BLK1)				Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Dissolved	ND	50.0	µg/L							
LCS (B17I265-BS1)				Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Dissolved	5090	50.0	µg/L	5000		102	85-115			
Matrix Spike (B17I265-MS1)		**Source: 1709092-02**		Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Dissolved	5090	50.0	µg/L	5000	ND	102	70-130			
Matrix Spike Dup (B17I265-MSD1)		**Source: 1709092-02**		Prepared: 28-Sep-17 Analyzed: 29-Sep-17						
Iron, Dissolved	5100	50.0	µg/L	5000	ND	102	70-130	0.2	20	

Qualifiers and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LOD	Limit of Detection
LOQ	Limit of Quantitation
ND*	In order to provide a consistent report format, numeric results provided by outside laboratories that are below the listed LOQ have been changed to "ND" at the LOQ provided by the outside laboratory.

Oregon Department of Environmental Quality Chain of Custody Record [1]

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1709137

Client[2]: *Drinking Water Source Monitoring*

Project[3]: *South Coast Source Water Fire Response* QAPP or SAP#[4]:

Survey[5]: Survey Batch[6]:

Sample Collector (s)[7]: *Thomas Lossen* Sampling Agency[8]: *DEQ* QTime Code[9]: 45513

LEAP Coordinator and Contact #11: *Aaron Borisenko x* Report Recipients[12]: *Aaron Borisenko* TAT or Due Date[10]:

Sample Information						Bottle Types[20]						
Item[13]	LASAR ID #[14]	Collection Date[15]: 09/26/2017 Station Name[16]	Time[17]	Sample Type[18]	Report Matrix[19]	Poly 1000mL; NaOH	Poly 250mL; HNO3	Poly 250mL; HNO3; Filtered	Poly 500mL; H2SO4			Request for Analysis[21]
1	*38949	City of Brookings, intake Chetco River 70m SW of RC	1145	GS	RS	1	1	1	1			
2	*38950	City of Gold Beach, intake WWTP, south bank of Rogue	1405	GS	RS	1	1	1	1			
3	*38948	Harbor Water PUD, intake Chetco R 100m DS of RC	0950	FP GS	RS	1	1	1	1			
4	10000	Equipment Blank	1442	EB	RW	1	1	1	1			
5	*38948	Chetco R 100m DS of RC Harbor Water PUD	0951	FD	RS	1	1	1	1			

Event Comments: * stations and descriptions created after samples were collected. 10/12/17 SR

Chain of Custody[22]

Relinquished By:	Agency/Company	Date/Time	Received by:	Agency/Company	Date/Time
Thomas Lossen	ODEQ	09/27/2017 0850	ARC	ODEQ	9/27/17 941

Oregon Department of Environmental Quality Chain of Custody Record [1] Page 2 of 3

* Office Use Only *
Affix Work Order Barcode Here
1709137

Client[2]: *Drinking Water Source Monitoring*

Project[3]: *South Coast Source Water Fire Response* QAPP or SAP#[4]:

Survey[5]: Survey Batch[6]:

Sample Collector (s)[7]: *Thomas Lossen* Sampling Agency[8]: *DEQ* QTime Code[9]: *45513*

LEAP Coordinator and Contact #11: *Aaron Borisenko x* Report Recipients[12]: *Aaron Borisenko* TAT or Due Date[10]:

Sample Information					Field Data[19, 20, 21]									
Item[13]	LASAR ID #[14]	Collection Date[15]: 09/26/2017 Station Name[16]	Time[17]	Sample Type[18]	Cond umhos (X)	DO (Lum) mg/L (X.X)	DO Sat (Mem.) % (X)	pH SU (X.X)	Temp °C (X.X)	Turb NTU (X)				Item Comment:[22, 23]
1	*38949	City of Brookings, intake Chetco River	1145	GS	114	10.2	118	8.3	21.0	<1	99232 N. Bank Chetco River Road			80. to 19000 cfs range confluence N. Fork Chetco 42.07381 -124.21372
2	*38950	City of Gold Beach, intake WWTP raw water	1405	GS	113	8.0	92	7.5	19.9	<1	raw water at plant before treatment			42.46471 -124.36274
3	*38948	Harbor Water PUD, intake Chetco River	0950	FP GS	107	9.9	106	7.4	18.2	<1		water	clear	42.06522 -124.23926
4	10000	Equipment Blank	1442	EB	1	8.6	108	6.0	25.9	<1				
5	*38948	~~Chetco River Harbor Water PUD, intake~~	0951	FD	119	9.4	110	7.8	21.2	<1				

Event Comments:

Oregon Department of Environmental Quality Field Meter Continuing Calibration Verification (CCV) For Office Use Only: Page 3 of 3 Work Order #: 170913

Client[2]: *Drinking Water Source Monitoring* Project[3]: *South Coast Source Water Fire Response*

Sample Collector(s)[7]: *Thomas Lossen* Survey[5]: _____ Survey Batch[6]: _____

Date[15]: 09/26/2017 Sampling Agency[8]: *DEQ*

Conductivity Meter ID[22]: SN JC01480 Accuracy Criterion: +/- 7%

	Pre time: 0820				Post time: 1501			
Std	Temp (°C)	Read (µS/cm)	Diff (%)	Pass[21] (Y/N)	Temp (°C)	Read (µS/cm)	Diff (%)	Pass[21] (Y/N)
100	15.7	99	-1%	Y	24.3	100	Ø	Y
1000	15.4	987	-1.3	Y	25.0	982	-1.8	Y

pH Meter ID[22]: 2574976 Accuracy Criterion: +/- 0.2 SU; Recalibration Criterion: +/- 0.1 SU

	Pre time: 0820					Post time: 1501				
Std	Temp (°C)	Theo (SU)	Read (SU)	Diff (SU)	Pass[21] (Y/N)	Temp (°C)	Theo (SU)	Read (SU)	Diff (SU)	Pass[21] (Y/N)
4	15.9	4.01	4.01	Ø	Y	25.0	4.00	4.03	0.03	Y
7	15.5	~~7.07~~ 7.06	7.06	-0.01	Y	27.0	7.00	7.03	0.03	Y
10	15.6	10.11	10.11	Ø	Y	25.6	10.00	10.03	0.03	Y

DO Meter ID[22]: 14A103211 Accuracy Criterion: btw 0.4 & -0.3 mg/L

Standard Type (Circle one):	Pre time: 0820				Standard Type (Circle one):	Post time: 1501			
Pre	Temp (°C)	mmHg	Read %	Read mg/L	Post	Temp (°C)	mmHg	Read %	Read mg/L
(Air)	16.5	761	100	9.8	(Air)	30.2	759	100	7.5
Water	Std (mg/L)	Diff (mg/L)	Pass[21] (Y/N)		Water	Std (mg/L)	Diff (mg/L)	Pass[21] (Y/N)	
Winkler	9.3	Ø	Y		Winkler	7.6	-0.1	Y	

Turbidity Meter ID[22]: 51386 Accuracy Criterion: +/- 5%

	Pre time: 0820				Post time: 1501		
Std	Read (NTU)	Diff (%)	Pass[21] (Y/N)	Read (NTU)	Diff (%)	Pass[21] (Y/N)
5.69	5.44	-4.4	Y	6.14	+7.9	N
46.9	47.0	0.2	Y	49.0	4.5	Y
491	487	0.8	Y	496	1.0	Y

ORP Meter ID[22]: Accuracy Criterion: +/- 20mV

	Pre time:				Post time:			
Std	Temp (°C)	Read (mV)	Diff (mV)	Pass[21] (Y/N)	Temp (°C)	Read (mV)	Diff (mV)	Pass[21] (Y/N)

Chlorophyll Meter ID[22]: Accuracy Criterion: +/- 5%

	Pre time:			Post time:		
Std	Read (NTU)	Diff (%)	Pass[21] (Y/N)	Read (NTU)	Diff (%)	Pass[21] (Y/N)

Calibration/Check Comments[23]:

Sample Receipt Checklist

Event Number: 1709137 Date & Time Received: 9-27-17 0941

Event Name: DRINKING WATER-SM S.C. FIRE RESPONSE Sampled Same Day: ☐ Y ☑ N

Shipping Containers

Number of shipping containers: 1

Samples require thermal preservation: ☑ Y ☐ N

Cooler(s) contained ice: ☑ Y ☐ N

Container / Cooler:	1			
Associated Items:	All			
Temperature Check:	0.1 °C	___ °C	___ °C	___ °C
Thermometer/Blank	☐	☐	☐	☐
IR/Sample	☑	☐	☐	☐

Corrective Actions

If the samples require thermal preservation and the cooler does not contain ice and the temperature check is >6°C, contact the sample collector and analytical manager and determine if analysis will proceed. All decisions to proceed, cancel, or resample must be documented in writing and attached.

Sample Containers

Yes	No	Standards
☑	☐	Were samples collected in the appropriate containers?
☑	☐	Were sample containers clearly and properly labeled?
☑	☐	Were sample container numbers recorded correctly on COC?
☑	☐	Were samples received intact and without damage?
☑	☐	Were sample volumes sufficient for the requested analyses?
☑	☐	Were all samples received within their holding times?

Corrective Actions

If the response to any standard is "No", contact the sample collector and analytical manager and determine if analysis will proceed. All decisions to proceed, cancel, or resample must be documented in writing and attached. Notify analysts of any holding times that are less than 72 hours.

Sample Preservation

Yes	No	Standards
☑	☐	Was sample preservation checked at the time of sample receipt?
		Answer the following question only if the previous response was "Yes."
☑	☐	Were all samples properly preserved (where appropriate)?

Corrective Actions

If the response is "No", notify analytical staff that preservation must be checked prior to analysis.

If the response is "No", attach the "Sample Preservation exception Form".

Chain-of-Custody

Yes	No	N/A			
☐	☐	☑	Was a custody seal present?	☐ On Cooler	☐ On Container
☐	☐	☑	Was the custody seal intact?	☐ On Cooler	☐ On Container
☑	☐	☐	Was the Chain of Custody form present and properly signed?	☐ Not Present	☐ Not Signed

Comments

Sample Receiver/Date: DRO 9/27/17

This form was created to comply with the requirements set forth in the NELAC 2003 standards Section 5.5.8.

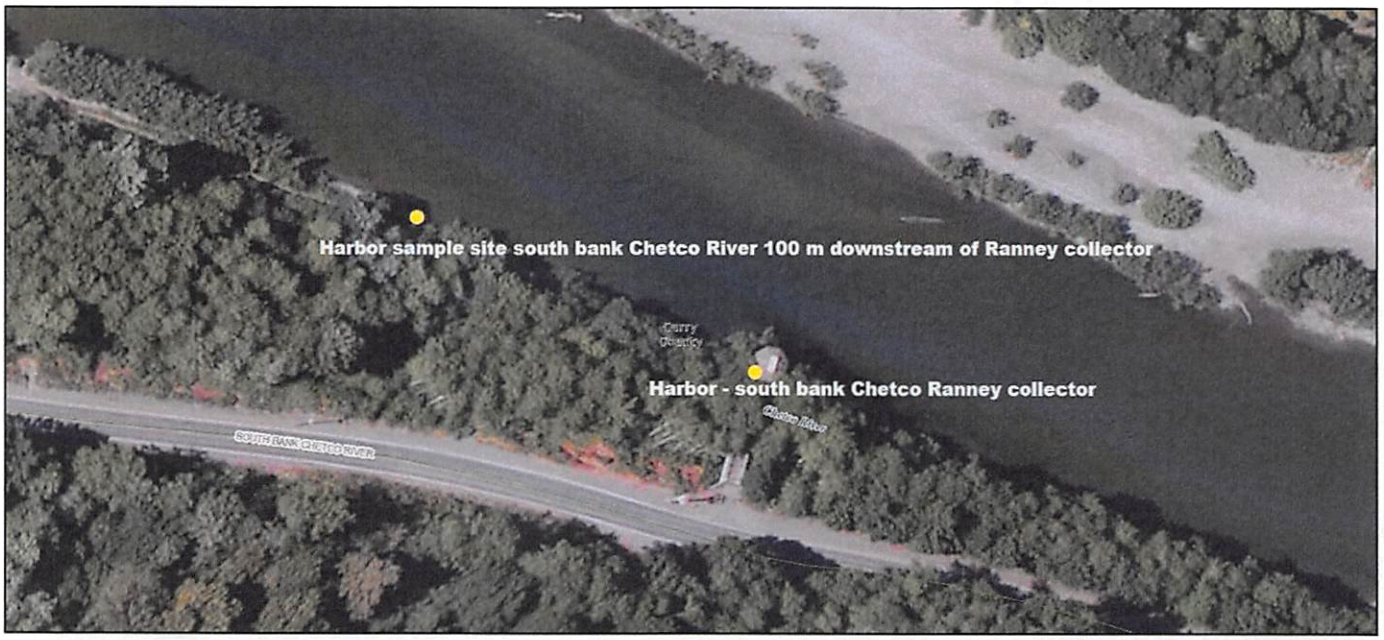
DEQ04-LAB-0043-FORM Version 1.3
Effective Date: 4/17/2012

South Coast Source Water Fire Response
09/26/2017

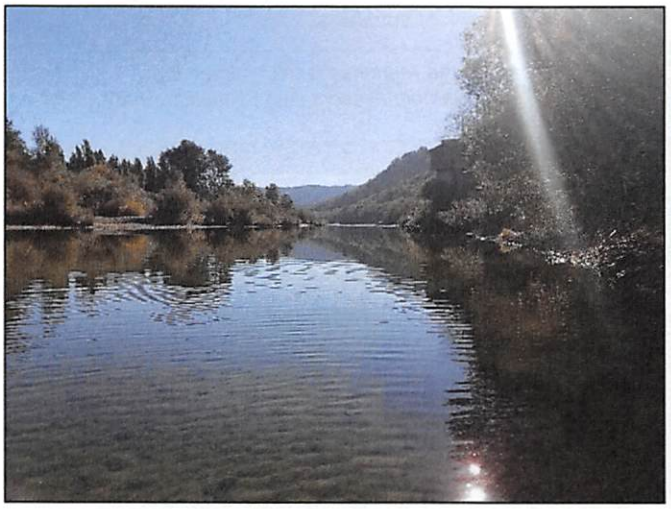
ODEQ Lab traveled to Brookings and Gold Beach to collect drinking water samples in response to the Chetco Bar Fire. The analytical parameters required raw water samples that had not been chlorinated.

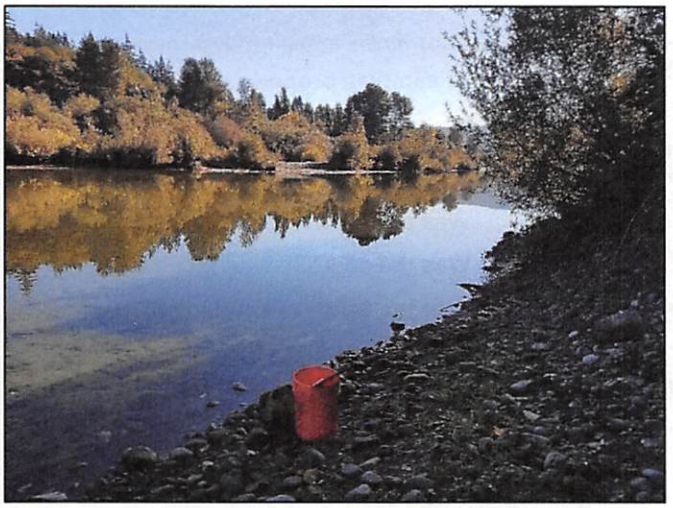
Harbor and Brookings have Ranney collector wells on the Chetco River. The Ranney wells collect water from the aquifer below the river. Public utility district personnel report most of the water in the well is supplied by the Chetco River. The well water is chlorinated at the source so the lab decided to collect water from the river source near the collector wells.

The Harbor drinking water samples were collected about 100 m downstream from the well where there was an access trail to the south bank of the Chetco River.



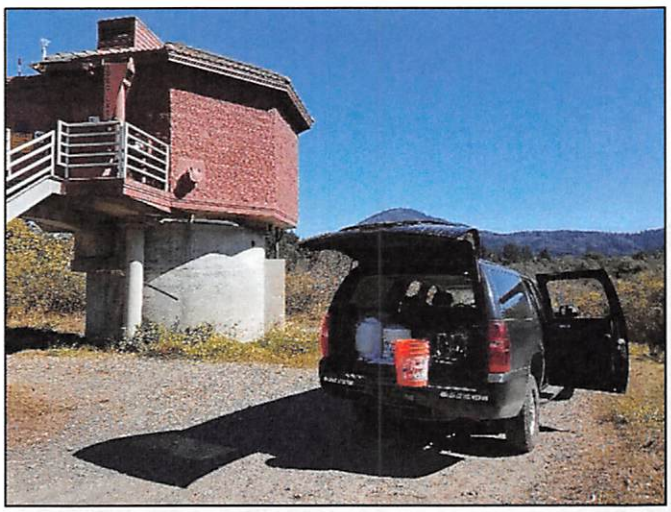
Harbor sampling site on the south bank of the Chetco River.

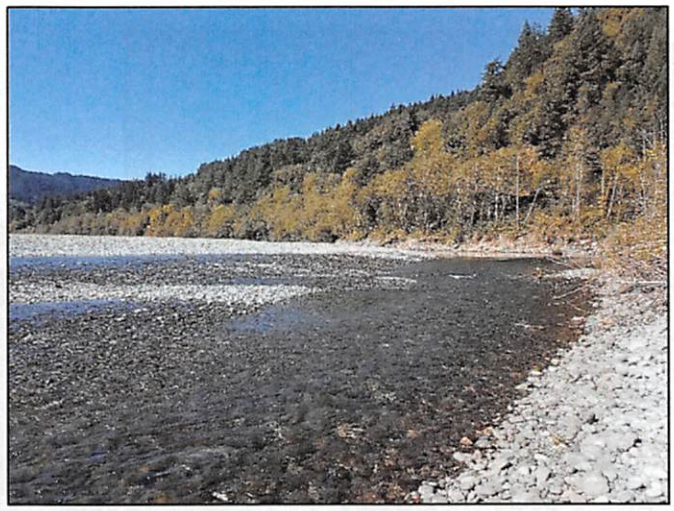




The Brookings drinking water samples were collected about 70 m southwest of the well a few meters downstream of the confluence of the Chetco and the North Fork Chetco Rivers.

Brookings sampling site 70 m SW of the well on the north bank of the Chetco River. The Mount Emily ridge in the background of the well and truck photo was burned in the fire.

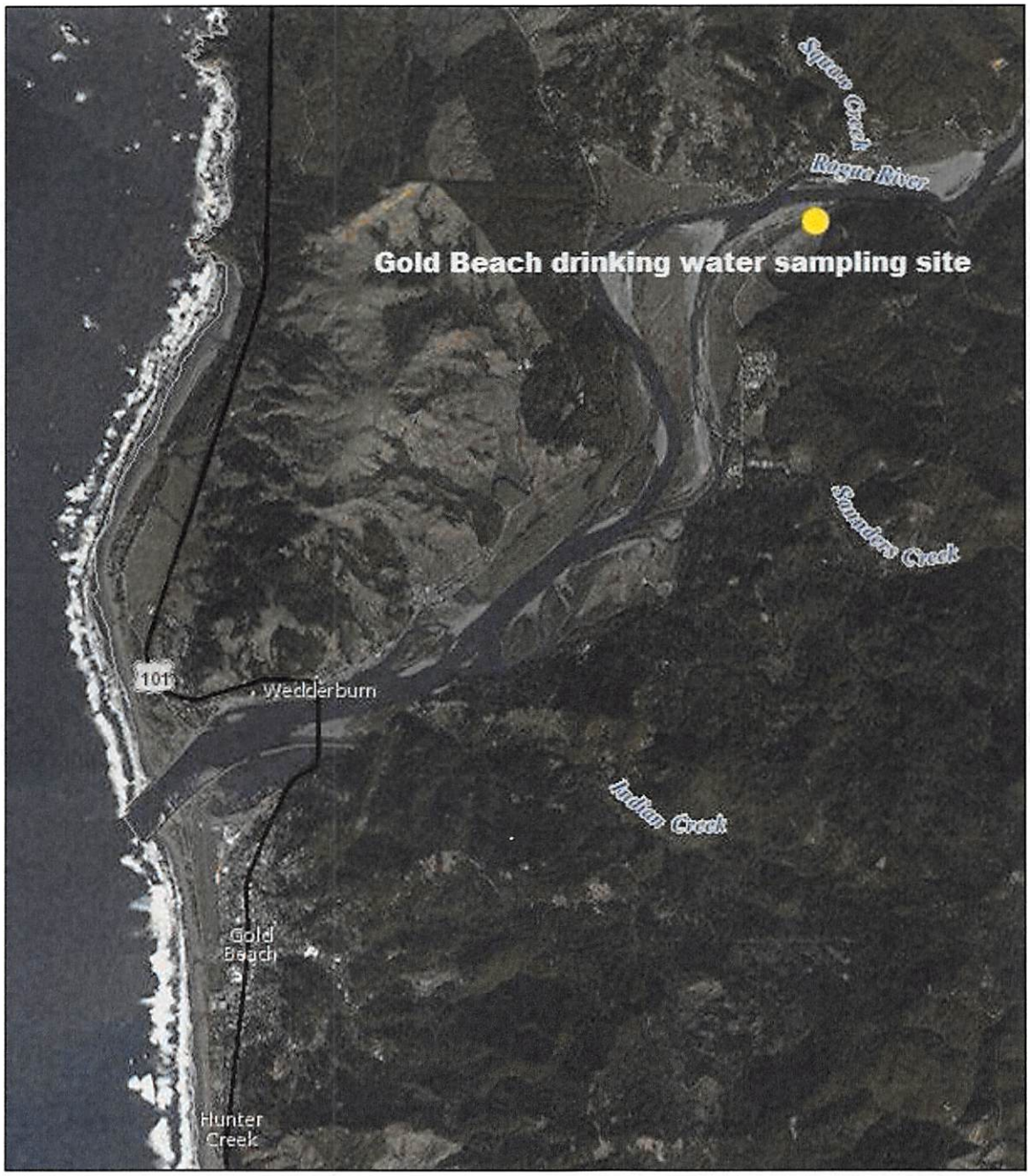




The Gold Beach drinking water samples were collected at the water treatment plant on the south bank of the Rogue River from a raw water spigot access.

The Gold Beach samples were collected from a spigot at the water treatment plant before treatment was added.

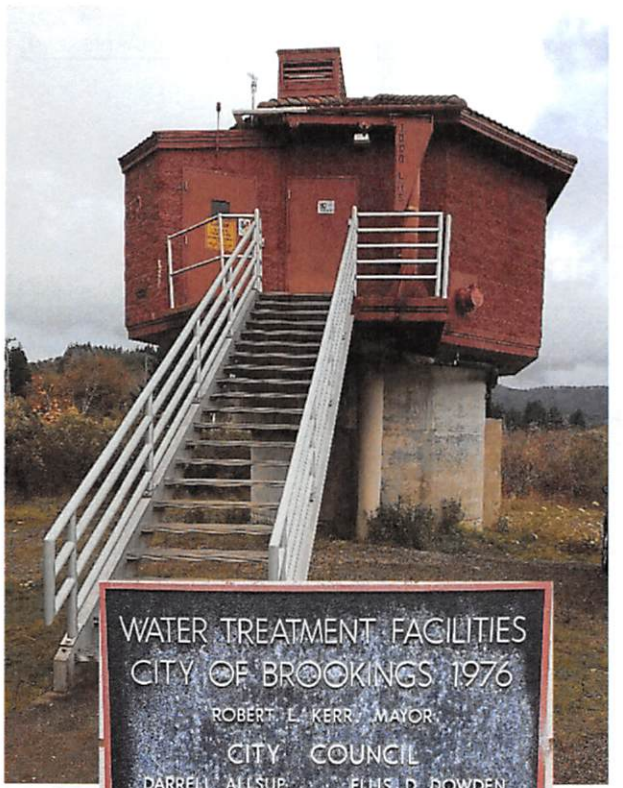
Gold Beach sample location: 42.46471N X -124.36274W



Brookings sample location: 42.07381N X -124.21372W
Harbor sample locatioin: 42.06522 X -124.23926

Attachment C – Stantec Report

Review of Potential Improvements or Modifications to the Existing Water Supply, Treatment Plant and Distribution System – In Response to Chetco Bar Wildfire, May 2, 2018.



Review of Potential Improvements or Modifications to the Existing Water Supply, Treatment Plant and Distribution System

In support of Contract for Technical Assistance for the Chetco Bar Fire impact on the City Water System

May 2, 2018

Prepared for:

City of Brookings

Prepared by:

Stantec

GSI Water Solutions, Inc.

BROOKINGS

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LIST OF APPENDICES

Executive Summary

The recent Chetco Bar Fire burned a significant portion of the Chetco River watershed and the water quality in rivers and streams could be impacted for many years to come. The City of Brookings' potable water supply is extracted underneath the Chetco River via a Ranney Collector and is classified as groundwater by the Oregon Health Authority. However, the resulting river water quality changes may affect City's supply in many ways including:

- Elevated turbidity, suspended solids, and/or pathogens
- Elevated color and total organic carbon (TOC) concentrations which can form high levels of DBPs following disinfection using chlorination
- Objectionable tastes and odors
- Trace concentrations of other objectionable organics, metals, and nutrients

The water quality pumped from the Ranney Collector can generally be described as excellent. Daily water use within the City has ranged from 0.6 to 1.9 mgd over the past 6 years, with annual average usage ranging from 0.9 to 1.0 mgd. Brookings is fortunate to have a 2 mgd conventional filtration plant (WTP) that can provide a barrier against certain contaminants such as turbidity and pathogens, but not for all of the potential contaminants listed above. The 40-year old WTP was operated daily through 2008, and has only operated a few weeks per year (on average) over the past few years, mainly to exercise equipment or as a safeguard when turbidities from the Ranney Collector exceed 0.1 NTU. It should be noted that the City is not required by the State to operate the WTP at all. However, as the WTP is a valuable asset, the City continues to maintain the WTP and keep it ready for operations if needed, including weekly backwashing of the multi-media filters.

Depending on the concentration and duration of the contaminants of concern from wildfire impacts, the existing WTP may need the following modifications to provide improved treatment:

- Higher coagulant doses (enhanced coagulation) to remove color and/or TOC
- New flocculators to take advantage of the tube settler systems (to clarify the water prior to filtration)
- Improvements to solids/backwash water handling system
- UV disinfection for inactivation of certain pathogens
- GAC contactors downstream of the high service pumps at the WTP for trace organics and tastes and odor control
- RO or NF to remove trace contaminants not removed by other processes
- VFDs for pumps at the Ranney Collector and at the WTP, to allow for slower/steadier flows throughout each day, which may allow a lower capacity treatment system to be installed

- De-rating of WTP capacity; customers could be asked to reduce or conserve water if necessary

The cost to implement some of these treatment improvements (dependent on which are needed) could be in the millions of dollars, and may take over a year to implement. These are presented in **Table ES-1**, and costs are provided as a rough order of magnitude for comparison purposes. The City could lower costs by implementing certain operational measures, such as reducing water consumption via conservation requirements.

Table ES.1 – Summary of Potential Treatment Improvements (2 mgd)

Improvement	Benefits	Project Cost	Increased Annual O&M Costs
Flocculators and misc. WTP and Ranney upgrades	Allows for enhanced coagulation for higher TOC and turbidity loading.	$1.5M+	$25k+
UV disinfection and electrical upgrades (inside WTP)	Increased pathogen inactivation (*Cryptosporidium*)	$500k+	$5k+
GAC pressure vessels (outdoors)	Treatment for trace organics and T&O.	$750k+	$20k+
New Reverse Osmosis Treatment System (new building)	Multiple trace contaminants.	$5M+	$300K+

Results from the limited baseline water quality sampling activities in 2018 have indicated minimal impacts to raw water quality from the Chetco Bar Fire. However, it could take another year or two (coupled with heavy rain events) for more-significant impacts to be observed.

1.0 INTRODUCTION

The City of Brookings' source of water comes from the Chetco River Watershed, a mostly forested area largely located on U.S. Forest Service (USFS) and Bureau of Land Management (BLM) lands. The City's raw water is collected through a subsurface intake system (also known as a "Ranney Collector") located near the lower end of the Chetco River watershed at the confluence of the North Fork River and mainstem of the Chetco River. Though classified as a groundwater source, the City has the option to filter the water pumped from its Ranney Collector at its water treatment plant (WTP), or deliver it directly after disinfection (by chlorination) to its 8,000 citizens.

1.1 BACKGROUND

The City has sporadically (0 to 6 weeks per year) used the conventional filtration plant over the past decade. It has typically only been used during periods when turbidities from the Ranney Collector have exceeded 0.1 NTU, or to exercise process equipment. The WTP is a "carryover" from when the City used to withdraw water from an adjacent surface water intake, but was continued to be used on a daily basis from 1985 (when the Ranney Collector was built) until 2008. **Figure 1** presents a location map indicating the main features of the City's supply and treatment system. Also shown for perspective is the location of Harbor Water's Ranney Collector.

During July through October 2017, the Chetco Bar Fire burned nearly 192,000 acres of the watershed. These acres are almost entirely within the City's source watershed upstream of the Ranney Collector. Both the Bureau of Land Management (BLM) and United States Forest Service (USFS) completed assessments of the burn area (Fall 2017), and identified major impacts with the potential for immediate and long-term increases in runoff flows, erosion, and water quality risks. BLM and USFS assessments noted that the intensity of the burn can cause physical changes to the drainage characteristics of the soils, reducing infiltration and increasing runoff from the watershed. As pointed out by the USFS hydrologist through e-mail communication, the increased runoff increases the risks of lateral and vertical channel scour from higher peak flow events. This could reduce the filtering capacity of the City's Ranney Collector, and expose it more directly to impacted water quality in the surface water. The loss of cover vegetation has also left the impacted portion of the watershed vulnerable to erosion, creating a high potential for runoff to carry significantly greater quantities of silt and ash during heavy rain events.

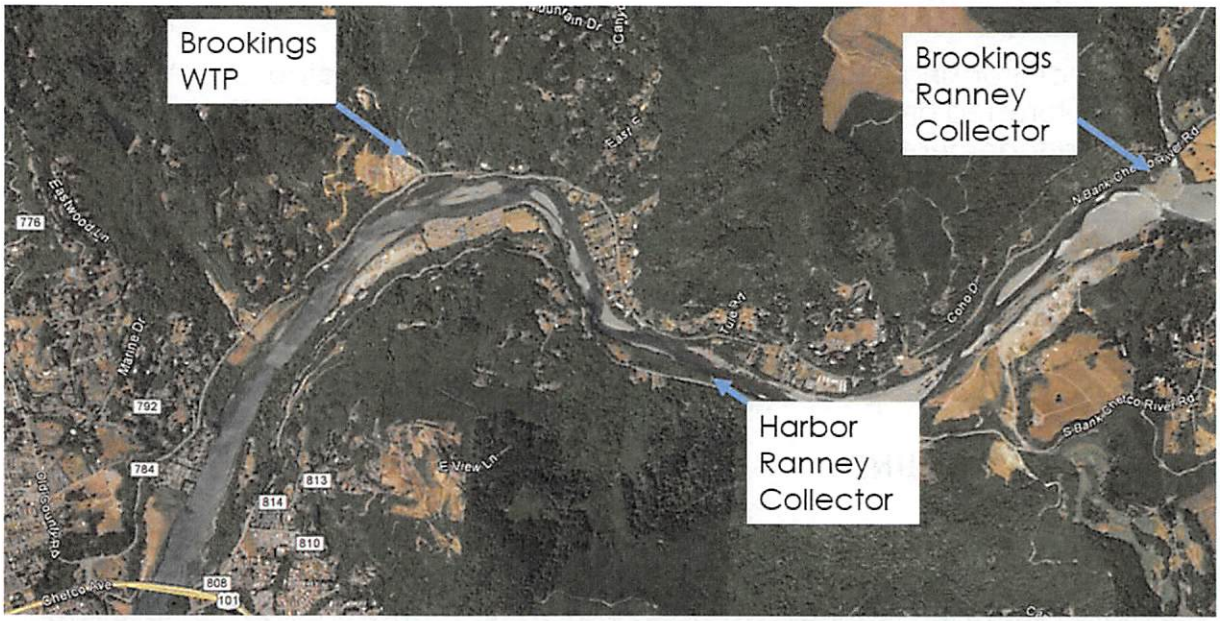

Figure 1 – Aerial Photo of WTP and Ranney Collector

The USFS assessment also noted major risks from water quality impacts of the fire, including elevated sediment/turbidity, dissolved organic compounds, nutrients, and metals in the river which could enter the Ranney Collector. Further, large quantities of aerial fire retardant (Phos-chek) were applied to combat the fire. The combined potential for channel scour exposing the collector laterals, and increased turbidity and poorer water quality could render it difficult for the City to deliver water that meets drinking water quality regulations and/or satisfy its customers. The USFS assessment also noted the risk of forming elevated levels of disinfection by-products (DBPs) as a result of chlorinating water that has higher levels of dissolved organics.

1.1.1 Purpose

The City of Brookings (City) established a professional services contract with GSI Water Solutions, Inc. (GSI) to provide as-needed technical assistance to address the Chetco Bar Fire impacts on the City's water system. GSI included Stantec as a teaming partner to assess treatment issues from potential water quality impacts from the fire. The work is funded in part by an Emergency Source Protection grant awarded to the City by Oregon Health Authority.

Per the Scope of Work developed, the main purposes of this report are to:

- Review the current conditions and recent historical performance of the WTP and Ranney Collector, and
- Identify potential treatment modifications/upgrades and distribution system operational adjustments based on anticipated/potential water quality changes as a result of the Chetco Bar wildfire.

This high-level evaluation considers the various processes/technologies that can address the types of water quality constituents that may be present following a significant wildfire in a large watershed, and which could occur for many years following the wildfire. The evaluation also presents costs and operational considerations.

1.1.2 Related Activities

Concurrent with the WTP Evaluation, other activities completed as part of the overall contract, include:

- Review of available historical water quality data from the Chetco River watershed to develop baseline information to compare and assess with new water quality and sampling efforts.
- Development and implementation of a water quality sampling and analysis plan (SAP), focused on various water quality parameters that could evolve following a large wildfire in the watershed.
- Analysis and interpretation of the first three rounds of the SAP (in 2018) within the context of the City's ability to treat the water (coordinated with this WTP evaluation).
- Assessing flow and river channel conditions and potential scour impacts to the Ranney Collector system, and develop potential modifications to consider
- Development of a Water System Response and Protection Plan

Findings and recommendations from these activities are documented in the summary technical memorandum "Water System Response and Protection Plan" prepared by the Project Team (last item in the bullet list above).

1.2 EXISTING SYSTEM BACKGROUND

As mentioned above, the City of Brookings provides high-quality drinking water, from its Ranney Collector system underneath the Chetco River, to over 8,000 citizens and to multiple businesses via 3,300+ service connections. **Figure 2**

presents a schematic of the distribution system which includes eleven reservoirs and seven pumping stations.

The untreated water supply, classified by OHA as groundwater, is pumped from the Ranney Collector, chlorinated (the only required treatment) and then delivered in a 16-inch diameter pipeline to the 2 mgd WTP located approximately 2.5 miles west. Typically, the chlorinated water by-passes the clarification and filtration systems at the WTP and discharges into the clearwell. Sodium hydroxide (NaOH) is added to increase the pH for corrosion control, and then the water is pumped from the clearwell to the distribution system via a 16-inch diameter transmission main. Chlorine can also be added at the clearwell, if desired to boost the residual.

1.2.1 Historical Water Usage

Water demand within the City varies on a seasonal basis. **Table 1** summarizes key water usage information for the past six years (2012-2017). **Figure 3** graphically presents daily water production for the past six years, and **Figure 4** presents average monthly production. The peak day usage each year has been in the range of 1.8-1.9 mgd and the annual average use has been in the range of 0.9-1.0 mgd.

Table 1 - Summary of Brookings Water Production from 2012-2017 (mgd)

Year	Annual Average	Peak Season[1] Average	Off Season[2] Average	Minimum Monthly Avg.		Maximum Monthly Avg.		Maximum Daily	
				Month	Value	Month	Value	Date	Value
2012	0.89	1.09	0.80	Mar	0.74	Aug	1.15	Aug-9	1.99
2013	0.95	1.16	0.85	Feb	0.75	Jul	1.24	Sep-13	1.90
2014	0.98	1.23	0.85	Dec	0.77	Jun	1.29	Sep-15	1.97
2015	1.01	1.26	0.89	Nov	0.79	Jul	1.37	Jul-29	1.79
2016	0.99	1.27	0.86	Apr	0.78	Aug	1.31	Jul-1	1.95
2017	1.02	1.24	0.91	Apr	0.82	Jul	1.37	Aug-2	1.96

[1]Peak Season is June through September
[2]Off Season is October through May

The Ranney Collector has three installed pumps, each rated at approximately 1,400 gpm (2 mgd) with 40 hp motors. The pumps are operated on a start/stop daily basis to meet system demands. One or two pumps are operated at a time, depending on demand and time of year.

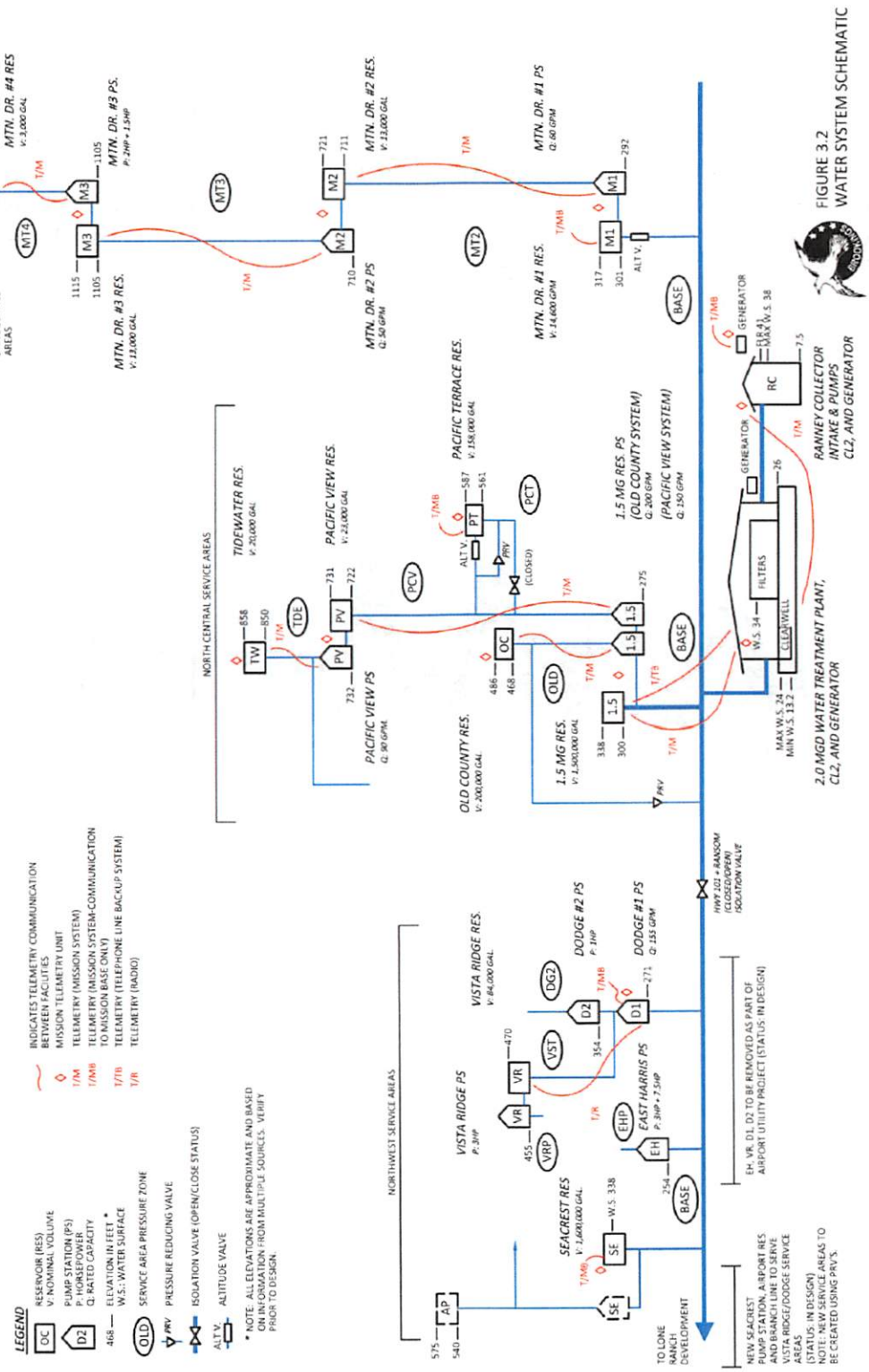

Figure 2 – City of Brookings Water System Schematic

There are three high service pumps located at the clearwell of the WTP, each rated at approximately 700 gpm (1.0 mgd). These pumps operate in similar fashion as the Ranney Collector pumps, to serve the City's zones on a daily basis and to fill 1.5 MG Reservoir. The pumps start when the water level in this reservoir reaches 33 feet and the pumps are stopped when the reservoir HWL of 38 feet is reached. Depending on system demand and pumping rates, the pumps at the Ranney Collector and at the WTP can be cycled on-off, two to three times per day. All of the pumps use constant-speed motors and none are equipped with variable frequency drives (VFDs).

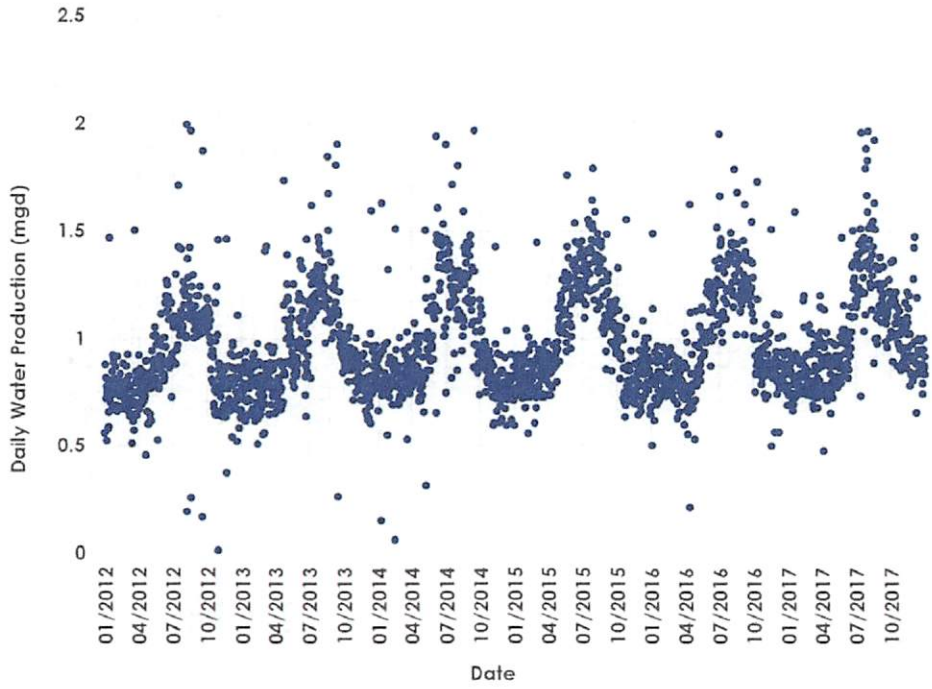

Figure 3 – Average Daily Water Production from 2012-2017

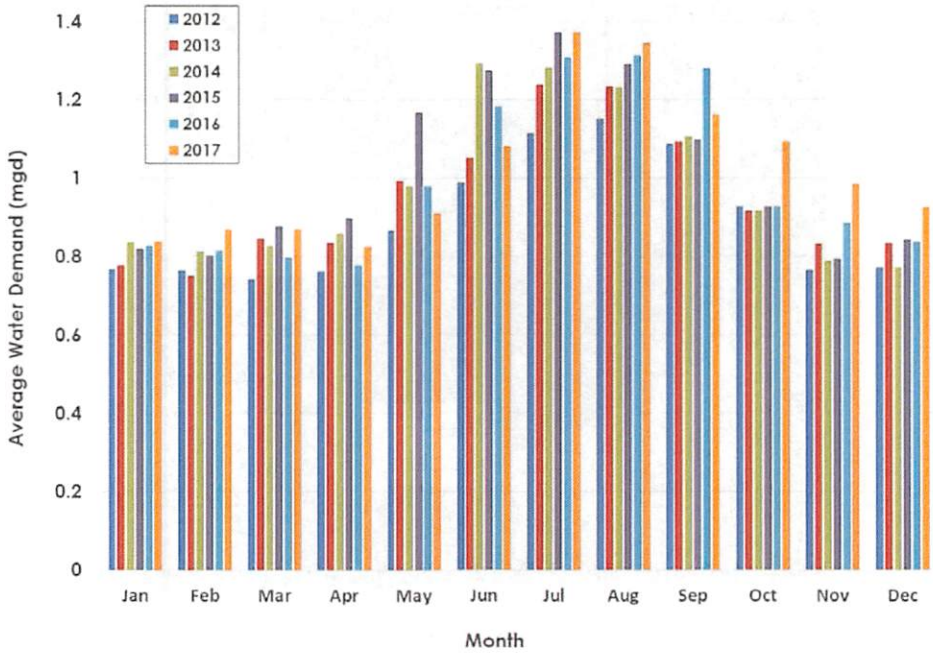

Figure 4 – Average Monthly Water Production from 2012-2017

1.2.2 Overview of WTP

Figure 5 is an aerial photograph of the WTP site including the main building, backwash/sludge holding pond and access road. **Figure 6** shows an interior floor plan inside the building.

The WTP was initially constructed and put into operation in 1976, and is now over 40 years old. It was originally built to treat river water withdrawn from an adjacent infiltration gallery. When the Ranney Collector was built in 1985, the WTP continued to be used to treat (filter) the water before distribution on a full-time, daily basis. According to City staff, the WTP was operated daily through 2008 and then was converted to a part-time/occasional operation.

The primary treatment processes for the WTP are contained in two, parallel pre-engineered (package) treatment units within steel basins, each rated at 1 mgd nominally. Three treatment stages are included within each unit:

- Horizontal paddlewheel flocculators
- Tube settlers
- Mixed-media filters

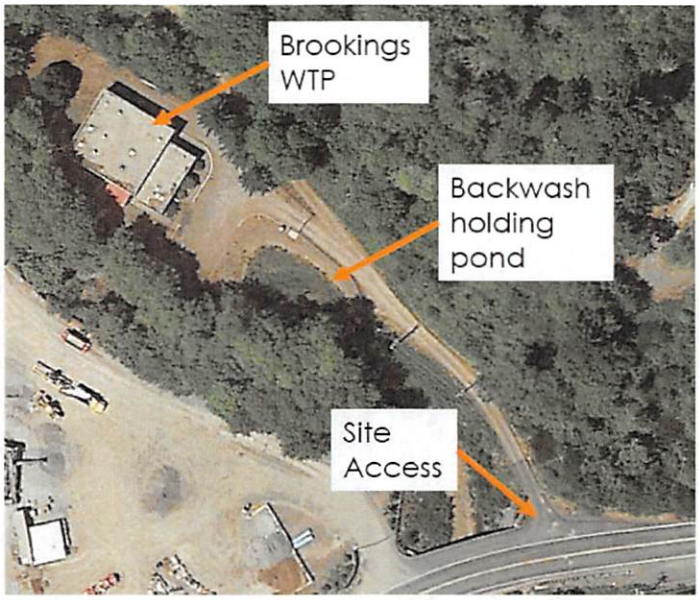

Figure 5 – Aerial Photo of WTP Site

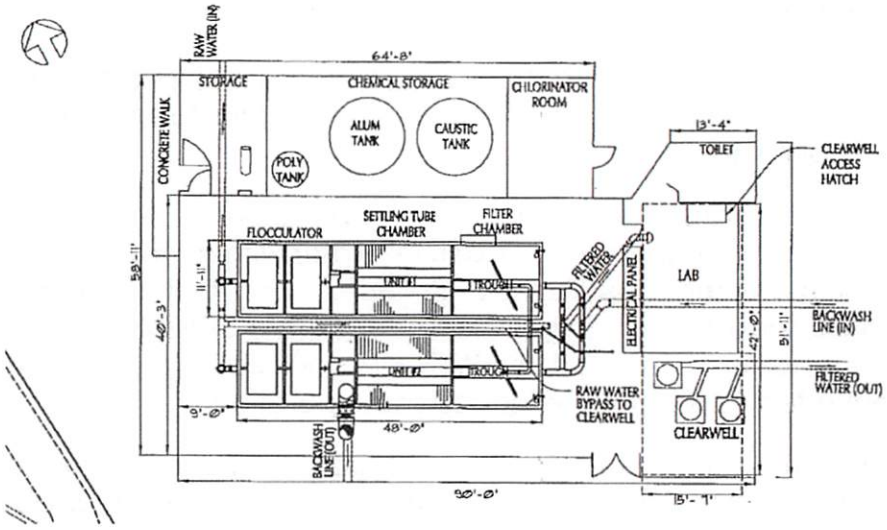

Figure 6 – Interior WTP Floor Plan from Master Plan (HGE)

The flocculators were removed from both units prior to 2008 for unknown reasons (perhaps due to maintenance problems), and have not been replaced. This has not affected treatment performance since the turbidities being treated are less than 1.0 NTU during the periods when the plant has been operated since 2008.

As mentioned previously, the City continues to keep the WTP ready for service, including the treatment units, even though the Ranney Collector supply is classified as a groundwater by the State and filtration is not required. Since 2008, the Ranney Collector supply by-passes the treatment/filter units unless the turbidity is greater than 0.1 NTU. The filters are backwashed weekly and the water within the treatment units is replaced with the same frequency.

The only chemicals used at the WTP on a continual basis are chlorine gas (Cl_2) and liquid sodium hydroxide (NaOH). Chlorine is added at the clearwell, when necessary, to provide a free chlorine residual of approximately 0.6 to 1.0 mg/L in the water delivered to the distribution system. NaOH is added to the water to increase the pH of the finished water to approximately 7.0 to provide corrosion control.

When the plant is operated to reduce the turbidity, two chemicals are added including liquid aluminum sulfate (alum) and a polymer. Alum doses have ranged from 3 to 5 mg/L, and polymer dose has ranged from 0.5 to 1.0 mg/L

1.3 HISTORICAL WATER QUALITY AND TREATMENT

This section briefly summarizes historical water quality and how it may impact treatment. One of the most-important water quality parameter is turbidity because it affects the City's decision to operate the WTP (filtration) versus by-passing the treatment units. The turbidity is generally less than 0.1 NTU, but has been greater than this level for periods over the past 6 years; perhaps correlating with high river flows. The WTP has been operated at times during 8 months over the past 6 years, when turbidities have exceeded 0.1 NTU. The highest monthly average raw water turbidity observed was 0.2 NTU in January 2012. As mentioned above, the WTP was operated daily from 1985 (when the Ranney Collector was built) until 2008, and then the City modified its operating procedures.

Other water quality parameters which can impact treatment performance include pH, alkalinity, temperature and organic carbon (TOC). While there is limited temperature and TOC data, the City routinely monitors pH, alkalinity and

conductivity. The following sections summarize these parameters from 2012-2017.

1.3.1 Alkalinity

Alkalinity is important in water treatment because of its impact on coagulation performance as well as its impact on corrosivity and pH stability. Alkalinity above 20 mg/L as CaCO3 is generally considered adequate for alum coagulation and for improved pH stability in the distribution system. Alkalinity can also impact Total Organic Carbon (TOC) removal requirements, depending on raw water organic concentrations.

The alkalinity from the Ranney Collector supply appears to vary seasonally as depicted in **Figure 7**. The raw water alkalinity can be as low as 10 mg/L during winter periods and can be as high as 30 mg/L during the summer. When the alkalinity is low and if turbidities become elevated, the addition of NaOH may be required to maintain a proper coagulation pH if a high alum dose is needed.

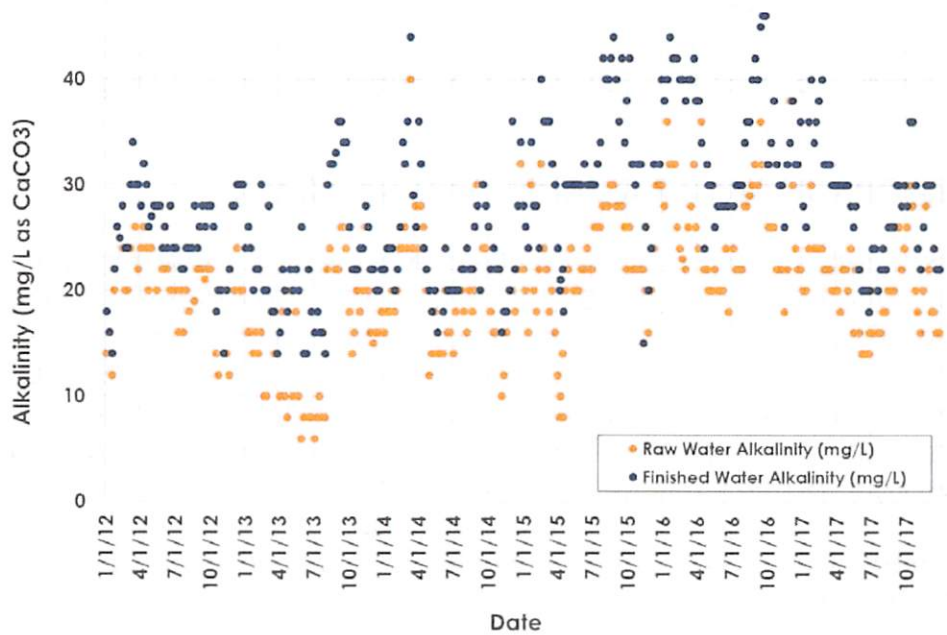

Figure 7 – Raw and Finished Water Alkalinity from 2012-2017

1.3.2 Finished Water pH

The pH is a measure of the acidic or basic nature of a water sample and can also be indicative of whether or not a water is corrosive. A pH of 7.0 represents neutral conditions, and pH values in excess of this are normally considered acceptable for corrosion control. Water with pH values less than 7.0 usually indicate corrosiveness, which can lead to leaching of toxic metals into the water system and degradation of conveyance facilities. The pH is also important in water treatment because of its impacts on coagulation performance and chemical disinfection. A pH in the range of 6.5 to 7.0 is considered optimum for alum coagulation (when removing turbidity only). In WTPs lacking the ability to adjust pH at several points throughout the treatment process, corrosion control typically governs pH, with perhaps some sacrifice in coagulation and disinfection performance. The pH can be altered with the addition of certain treatment chemicals; alum depresses the pH and NaOH increases the pH.

Figure 8 shows that the finished water pH has generally hovered between 6.7 and 7.2, with a target of 7.0.

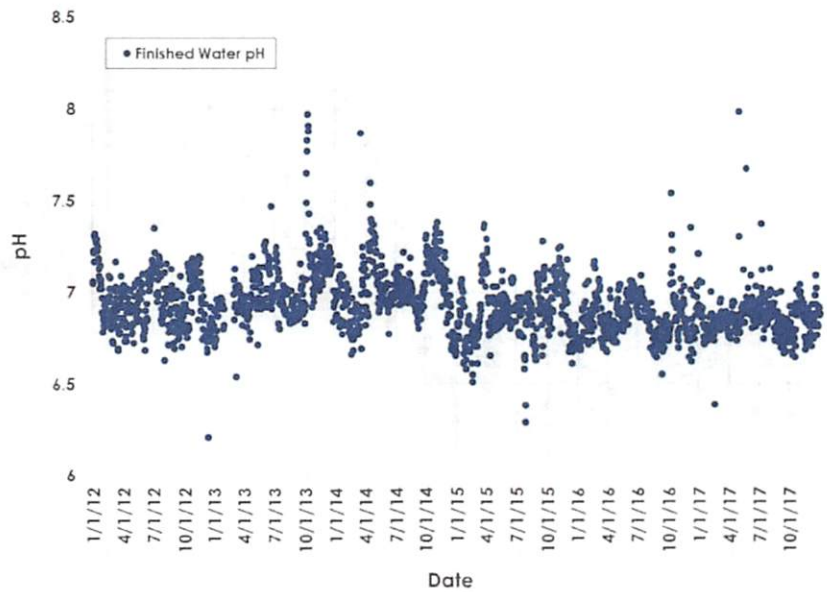

Figure 8 – Finished Water pH from 2012-2017

1.3.3 Conductivity

The City has also been monitoring total dissolved solids (TDS) as measured by conductivity. This water quality parameter has recently become important because of concerns regarding elevated salinity caused by seawater intrusion. The Harbor People's Utility District also utilizes a Ranney Collector on the southern bank of the Chetco River approximately 1.5 miles downstream of Brookings' Ranney Collector. Starting in 2014, Harbor started noticing elevated TDS (sometimes greater than 1,000 mg/L = 1,560 uS/cm of conductivity) during the late summer when rivers flows were below average and coinciding with high tides. Therefore, Brookings decided to start monitoring for conductivity and this data is presented in **Figure 9**. The calculated TDS of the water pumped from Brookings' Ranney Collector has always remained low (less than 100 mg/L), and is probably too far upstream to be affected by high tides. The reason for the "jump" in conductivity values between 2014 and 2015 is yet unclear. *(Note, further discussion and input with the City warranted for this observation)*

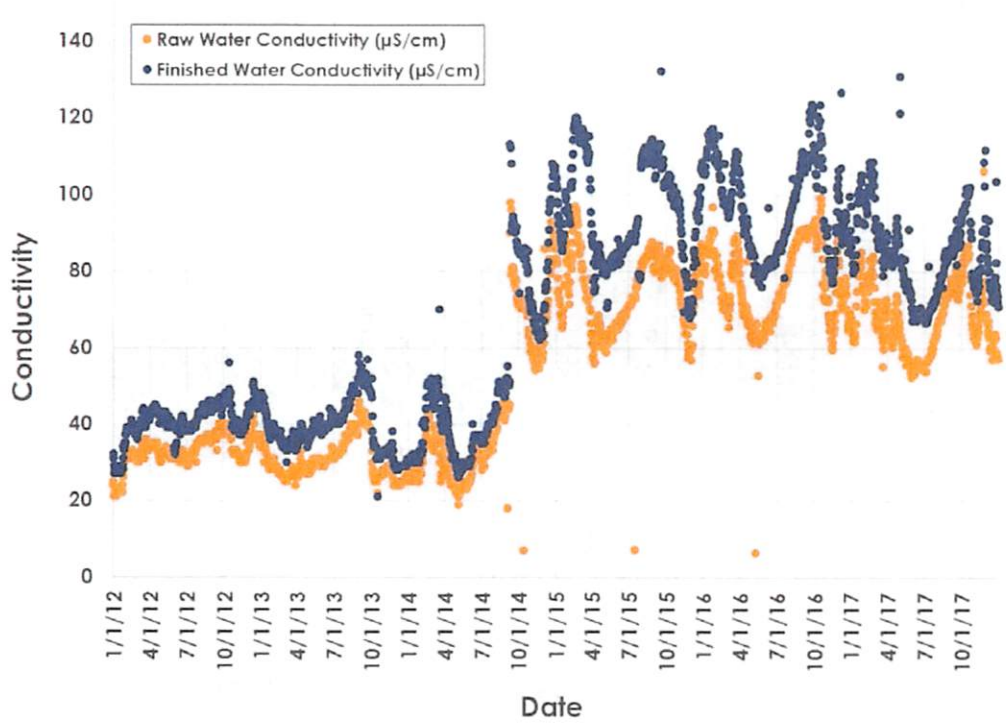

Figure 9 – Raw and Finished Water Conductivity from 2012-2017

1.3.4 Regulatory Review

There are currently drinking water quality standards for 95 primary and 12 secondary contaminants in the State of Oregon (State). Under the Oregon Drinking Water Quality Act, each contaminant has either an established MCL or recommended treatment technique. These contaminants are grouped into the following general categories with the current City schedule requirement:

- Inorganic Contaminants (IOCs) – 9 years,
- Organic, Synthetic and Volatile, Compounds (SOCs and VOCs) – 3 years,
- Radiologic Contaminants – 9 years,
- Disinfectants and Disinfection Byproducts – twice annually, and
- Microbial Contaminants – monthly

In the latest round of required regulatory sampling, there were mostly non-detects or levels well below regulatory limit for contaminants.

1.3.4.1 Disinfectants and Disinfection Byproducts

The Federal Total Trihalomethane Rule (TTHM Rule) was published in the Federal Register in November 1979; Oregon adopted the MCLs established in this law in September 1982.

The TTHM Rule set an MCL for TTHM of 0.10 mg/L based on a running annual average of quarterly sampling in the distribution system. However, these MCLs were superseded when the State of Oregon adopted the Stage 1 Disinfectants/ Disinfection Byproducts Rule (D/DBPR) on July 15, 2000. The Stage 1 D/DBPR added an MCL of 0.060 mg/L for five haloacetic acids (HAA5), and reduced the MCL for TTHMs to 0.080 mg/L. The Stage 2 D/DBPR was promulgated by the EPA on January 4, 2006 and built on the Stage 1 rule by requiring that compliance be based on locational running annual averages (LRAAs) rather than a system-wide average of all sample locations. In addition, the Stage 2 D/DBPR required systems to revisit sample locations and perform more DBP sampling to determine sample locations that are most representative of worst-case DBP water quality.

The current schedule for the City requires two samples be taken annually for HAA5s and TTHMs. Over the past 5 years, the City has routinely had non-detect levels (below lab method detection) of HAA5s, and levels of TTHMs well below (less than 10%) the regulatory limit.

1.3.5 Taste and Odors

Taste and odor events from the City's water supply are very rare in Brookings. As mentioned prior, Harbor PUD's customers located downstream on the Chetco River have experienced seasonal salty tasting water. The conditions upstream are apparently not as conducive to potential seawater intrusion impacts.

Increase in organics loading in the river post-wildfire could promote algal activity during the summer and fall in the upper parts of the watershed. Algae can produce excessive concentrations of MIB and geosmin which are organic compounds that impart earthy or musty tastes and odors to the water and could migrate through the Ranney Collector. These compounds do not present a health hazard, but create an aesthetic and public perception problem. They can be detected by humans at levels as low as 3 parts per trillion.

Because of the low historical occurrence of taste and odor in its water supply (only eight complaints since 2012) and the high quality of its source, the WTP is not equipped with processes capable of removing earthy or musty tastes and odors. The only treatment alternatives for this particular water quality issue include the following:

- Oxidation with ozone
- Adsorption with high doses of powdered activated carbon (PAC)
- Adsorption with granular activated carbon (GAC), either as a filter adsorber or in a separate contactor
- Oxidation using ultraviolet (UV) light combined with addition of hydrogen peroxide

1.3.6 Chemical Usage

As mentioned prior, chlorine is added at the Ranney Collector using chlorine gas stored in 50-lb containers. Chlorine can also be added at the WTP to boost the chlorine residual in the finished water, if necessary. The City typically will use 8 to 12 pounds of chlorine per day.

Also mentioned prior, liquid sodium hydroxide (NaOH) is added at the WTP to raise the pH for corrosion control purposes. Typical NaOH use has been around 7 to 10 pounds per day.

When the plant is operated to reduce the turbidity, two coagulant chemicals are added including liquid alum (4 to 6 pounds per day) and a polyacrylamide polymer.

2.0 POTENTIAL WATER QUALITY IMPACTS FROM WILDFIRE

Based upon information gathered from other utilities' experiences following a major wildfire (EPA 2009) and based upon site-specific discussions with Brookings' staff, the following are considered to be highest-priority water quality impacts within the Chetco River basin which may occur in the aftermath of the Chetco Bar wildfire:

- High sediment loadings in the river
- Elevated turbidity/suspended solids
- Elevated pathogens (*Giardia*, *Crypto*, viruses, coliforms, etc)
- Elevated color and/or organic carbon (TOC and DOC)
- Objectionable tastes and odors (T&O)
- Trace inorganics/organics (fire retardants, etc.)
- Nutrients (nitrogen and phosphorus compounds)
- Metals and cyanide

Each of these water quality challenges is discussed briefly below, mostly as it relates to how these might impact the City's ability to continue providing high-quality potable water to its customers if any of these contaminants are present in the water supply.

2.1 HIGH SEDIMENT LOADS

This condition could occur during and following heavy rains which could wash out high volumes of soils and silts from the affected areas of the wildfire, which would then end up in the river. This would be more of a concern if Brookings had a surface water intake, but the subsurface Ranney Collector system, underlying sands and gravels, should avoid large volumes of settleable solids from entering the raw water pipeline.

However, if high sediment loads persist in the river, it could conceivably be possible to plug the river bed and thereby reduce the infiltration capacity into the collector laterals. The presence of high sediments is also related to the potential occurrence of high turbidities, which is discussed below.

2.2 HIGH TURBIDITY/SUSPENDED SOLIDS

Turbidity is a measure of the light-scattering property of water which contains suspended particulate matter. Turbidity usually represents the very small

particles which will not settle without "assistance" (such as colloids). Turbidity may also represent a fraction of the settleable solids within the water column.

It is quite possible that high turbidities in the river can impact what enters the Ranney Collector laterals. Based on historic turbidity data from the Ranney Collector, turbidities have approached 0.3 NTU during some winter months, which probably correlates with high river flows and high turbidities. So, if excessively high turbidities occur in the river from the wildfire runoff, it is possible that turbidities > 0.3 NTU could occur in the Ranney Collector effluent. It is difficult to predict how high turbidities from the Ranney Collector might reach, but it seems like 5 NTU is a "reasonable" upper limit.

The existing WTP has been able to successfully filter the higher-turbidity water in the past, and is likely to be able to filter even higher turbidity water if necessary. It would be ideal if the flocculators were operational to help with floc formation and filterability during an extended period of elevated turbidities, but as long as the influent turbidity is less than 5 NTU, the existing plant without flocculators may still be able to produce acceptable water without backwashing too frequently.

Higher turbidities will likely require higher coagulant dosages and more-frequent backwashing. These conditions could impact the ability of the existing backwash/sludge pond to clarify the residual stream before the overflow is discharged to the adjacent creek.

2.3 ELEVATED PATHOGEN CONCENTRATIONS

There is limited reference information available that addresses pathogen level impacts after a wildfire event. While it is unlikely that there will be a measurable increase in net pathogen (coliform, virus, etc.) activity in the watershed, what may occur is that a larger concentration could be washed into receiving streams during storm events via increased sediment loads.

2.4 ORGANICS AND COLOR

The current levels of dissolved organic carbon (DOC), TOC and color in the Chetco River, and in the water pumped from the Ranney Collector, are low. This is further reflected by the low concentrations of disinfection by-products (DBPs) in Brookings' distribution system. If the concentrations of TOC/DOC and/or color increase in the wake of the Chetco Bar fire, it is possible that the Ranney Collector supply could also exhibit elevated TOC/DOC and color.

Color and/or TOC can be removed from the water via conventional treatment methods (coagulation/sedimentation/filtration), with coagulation conditions (type, dosage, pH) dependent on concentrations and desired finished water quality. Advanced oxidation and adsorption can also be considered as additional treatment options.

2.5 TASTES AND ODORS

Briefly discussed in the water quality review section, objectionable tastes and odors (T&O) can come from a variety of sources and are generally considered to be aesthetic issues and not health-related issues. The sources of T&O in drinking water can originate from high concentrations of algae (which then release T&O compounds into the water), from decaying organic matter, or from high concentrations of minerals or metals. Customers will often notice high concentrations of chlorine which can be considered a nuisance. In the case of the Chetco River, the occasional presence of elevated TDS/salinity (as experienced in the Harbor water supply recently) can result in objectionable T&O. The frequency and duration of T&O events can vary widely from year-round to infrequent seasonal episodes.

The potential for objectionable T&O to occur in a surface water supply following a major wildfire in the watershed is considered to be fairly high based on literature and experiences in other western United States locations. Often times this can present as smoky or earthy tasting water (Waskom 2013).

Depending on the type of T&O and the concentration/frequency/duration, various treatment methods can be considered including advanced oxidation and adsorption.

2.6 OTHER TRACE ORGANICS

Based on reported/documented occurrences elsewhere in the western US, there is the potential for degraded WQ with trace organics to continue for many years following the wildfire, or have little to no impact dependent on a number of factors (EPA 2009). As the City has not detected SOCs or VOCs from routine regulatory monitoring, if there are any detections in the future, they could potentially be linked to the impacts from the wildfire.

2.7 NUTRIENTS

Chemical compounds which include nitrogen (N) or phosphorus (P) can be released into the waterways following a wildfire via releases from vegetation and/or soils, or from the use of fire retardants. These compounds can be either organic (associated with carbon) or inorganic. Phos-Chek was apparently used over wide areas during the Chetco Bar fire. Inorganic nitrogen compounds such as nitrite and nitrate can occur in water under the right conditions.

The presence of high concentrations of nutrients, including ammonia and phosphates, can trigger growth of algae species in water, which can then lead to T&O events. These events can be seasonal in nature since algae thrive in warmer water.

Depending on the type of compounds present in the water, removal can be achieved via conventional treatment (coagulation/filtration) or adsorption.

2.8 METALS AND CYANIDE

Up until the 2009 Station Fire in Southern California, there had been limited information collected and summarized about trace metal levels seen in receiving waters after a wildfire (Burton 2016).

Concentrations of copper, iron, manganese, mercury, arsenic, lead, and nickel were higher in samples collected inside the burn area post storm event, which indicated the Station Fire played a major role in mobilizing these trace elements. The primary mechanism for the mobility of these trace elements was with the movement of sediment. It should also be noted that a blanket of ash (lye) can increase soil pH, and influence the species of metals that get released.

Cyanide levels may also be observed after a wildfire. Sodium ferrocyanide is found as an anti-corrosion agent in fire retardants, and can release cyanide ions when UV degraded or exposed to high temperatures.

3.0 TREATMENT AND OPERATIONAL OPTIONS TO MITIGATE WATER QUALITY CHALLENGES

Based on information presented above, there are treatment modifications which can be considered by the City if the water quality from the Ranney

Collector is degraded as a result of the Chetco Bar fire. The City is fortunate to have a 2 mgd conventional WTP which can be used for select circumstances, but it was not designed to treat/remove many contaminants of concern for this situation. There are also possible operational modifications which can be considered to mitigate or reduce impacts from certain WQ conditions.

3.1 TREATMENT MODIFICATIONS

There are many potential improvements or modifications that could be made to improve treatment performance, but for this high-level evaluation they have been categorized into the five options discussed further in this section.

3.1.1 Enhanced Coagulation

This option would help address increased turbidities, some organics, and sediment loading in the source water. Specific components are around improving the existing flocculation/sedimentation basins and would include:

- Replace/reinstall the flocculators
- Improve baffling and reduce short-circuiting within the basins
- Evaluate different coagulants and high doses of coagulants
- Improve chemical feed systems
- Expand backwash/residuals handling pond to handle additional loading from WTP

3.1.2 Enhanced Disinfection

If pathogens become a concern, the WTP could be used continuously to provide a physical removal step in addition to chlorine disinfection. However, depending on the level of treatment credit that may be required, disinfection using ultraviolet light (UV) or chlorine dioxide could be a more sustainable long-term solution. This could be used with or without filtration depending on water quality challenges. An example of a medium-pressure UV unit is shown in **Figure 10**.

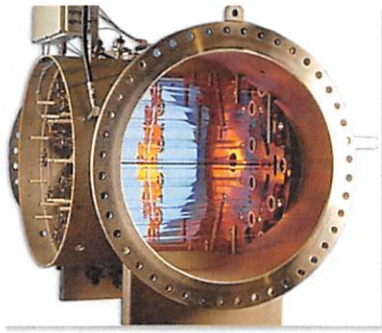

Figure 10 – Medium Pressure UV Reactor

3.1.3 Activated Carbon Adsorption

Powdered activated carbon (PAC) and granular activated carbon (GAC) have a long track record for being able to remove and treat many types of organic contaminants.

PAC is typically dosed in a slurry solution as far upstream in the treatment process as possible to provide a long contact time for adsorption of target contaminants. At the WTP, the PAC would be settled out in the sedimentation basin and would likely generate a large amount of sludge (depending on dosage) that would then need to be disposed. PAC can be an attractive alternative as it can be mobilized quickly and has a relatively low capital cost for implementation. However, using on a long-term or extended basis would result in high material costs, and increased solids handling. A temporary PAC feed system is shown in **Figure 11**.

Figure 11 – PAC Temporary Feed Bulk Bag System

GAC comes in different sizes, but can be used as a filter media that is lighter than traditional anthracite media. GAC has open areas on its surface that facilitate adsorption of molecules/compounds. The adsorption capacity of GAC depends on a lot of different variables, but the most important is the length of time that the water is in contact with the media. The primary design criteria for GAC adsorption of organics is empty bed contact time (EBCT). EBCT is calculated as the volume of the GAC divided by the flowrate. An optimal EBCT for most organics removal is 10 minutes (or greater), and the typical minimum suggested EBCT is 5 minutes. There are some installations of GAC as a filter media which use < 5 minutes of EBCT. The GAC's adsorption capacity eventually exhausts and the GAC needs to be replaced, with the frequency of replacement depending on flow volumes treated and water quality; such as total organic carbon (TOC).

GAC can be employed at the WTP using two different methods:

1. As a filter media, and/or
2. As a stand-alone contactor arrangement, either in pressurized vessels or in open/gravity basins.

The primary purpose of multimedia filters is for particle removal, however the top layer of anthracite media can be replaced with GAC media to provide a dual role of particle removal and to facilitate removal of organics. In order for GAC to be effective at removing selected organic compounds sufficient EBCT must be provided. Therefore, the depth of GAC needs to be enough to provide a minimum EBCT to meet the removal requirements, at the maximum filtration rate. Preliminary analysis of the existing WTP filter beds indicate that replacement of the anthracite with GAC would not provide sufficient EBCT if the WTP were to be run at its 2.0 mgd capacity.

It is possible to achieve >7.5 minutes of EBCT if new pressure GAC contactors are used downstream of the existing filters. The most economically feasible pressure vessel for this application would be vertical and 10-feet diameter by 20-feet tall, containing about 20,000 pounds of GAC. Two vessels would be needed to provide 2.0 mgd of treatment capacity. An example of this system is shown in **Figure 12**. Of the activated carbon options, this is the one that would be recommended to be evaluated further for potential implementation. Costs for this option do not include a building, and assume a suitable location could be found between the filters and first customer in the distribution system.

Figure 12 – GAC Pressure Vessels (courtesy of TIGG)

It should be noted that the adsorption capacity of the GAC will decrease over time, as it continues to remove TOC from the feedwater. Hence, the GAC must be replaced/regenerated every few years depending on site-specific conditions and GAC type. Therefore, if using for organics or T&O control, the ability of GAC decreases over time, until the media is replaced. The GAC replacement requirement is often considered a major disadvantage of using GAC as a filter media for T&O control, when compared with other options, since it disrupts plant operations and creates additional costs. However, GAC has the advantage of being passive in that it doesn't need to be turned on/monitored like a PAC or advanced oxidation system.

3.1.4 Advanced Oxidation

Certain oxidants or oxidation processes are strong enough to alter/destroy trace organics or contaminants of concern. These processes include:

- Ozonation
- UV-mediated advanced oxidation process (UV AOP) using high-dose UV plus chlorine or peroxide as an oxidant

The use of ozone in drinking water treatment plants has increased over the past two decades as provides multiple water quality benefits, including excellent T&O control, reduction of chlorinated DBPs, disinfection of *Cryptosporidium* and *Giardia*, oxidation of trace organics, micro-flocculant for improved filtration performance, ability to enhance the bio-filtration process, and destruction of algal toxins. Ozone is usually added to the raw water prior to coagulation, or prior to filtration following clarification.

Use of UV-mediated AOP for T&O control requires a post-filtration location (to achieve the highest UV transmittance possible through the UV reactors) and is not as widespread in the US compared to ozone, however it offers potential cost, space and operating complexity benefits (compared to ozone) which should be considered. This process creates extremely reactive species such as hydroxyl radicals and/or chlorine radicals which destroy organic compounds in the water, while the high-dose UV continues to provide disinfection benefits. This process is still considered "evolving" as many utilities and manufacturers around the country are studying it to develop better design, operating and cost information.

Due to the large overall costs and operational complexities of using advanced oxidation, it was not considered further as part of this evaluation.

3.1.5 High-Pressure Membrane Filtration (NF or RO)

The most extreme case of advanced treatment would be considering use of nanofiltration or reverse osmosis. Nanofiltration (NF) is typically used when trying to soften water, and reverse osmosis (RO) for dealing with brackish or high TDS waters. If enough minerals and/or ions start impairing water quality, a high-pressure membrane system may be an option worth investigating further.

One of the biggest challenges facing RO systems is the volume and quality of reject water (also referred to as concentrate or brine), mostly as it relates to its handling and disposal. Up to 20% of the RO influent flow is produced as concentrated brine solution, which represents 0.5 mgd (350 gpm) at the maximum permeate flow of 2.0 mgd to replace/supplement the WTP. An RO system would represent the most robust treatment system that could be employed for severely impaired water.

Implementation of an RO system would require a new building, chemical feed systems, and a post WTP filter tie-in location. Also, brine disposal would need to be handled by the City's wastewater treatment plant or some other method.

3.1.6 Summarized Cost Comparison for Treatment Improvements

High-level, rough order of magnitude project and O&M costs for the treatment options screened for consideration are presented in **Table 2**. These are provided as a baseline for comparison and can be used to help the City decide if they would like to evaluate any particular option(s) further.

Table 2 – Summary of Potential Treatment Improvements (2 mgd)

Improvement	Benefits	Project Cost	Increased Annual O&M Costs
Flocculators and misc. WTP and Ranney upgrades	Allows for enhanced coagulation for higher TOC and turbidity loading.	$1.5M+	$25k+
UV disinfection and electrical upgrades (inside WTP)	Increased pathogen inactivation (*Cryptosporidium*)	$500k+	$5k+
GAC pressure vessels (outdoors)	Treatment for trace organics and T&O.	$750k+	$20k+
New Reverse Osmosis Treatment System (new building)	Multiple trace contaminants.	$5M+	$300K+

3.2 OPERATIONAL MODIFICATIONS

There are a number of operational modifications that could be made separately or in combination to the existing WTP and Ranney Collector to help mitigate water quality impacts. These are summarized in the following bullets:

- Keep WTP flows low to increase sedimentation time and decrease filter loading rates. This may require curtailment or conservation measures be implemented by the City.
- Extend daily Ranney Collector/WTP operation and reduce instantaneous pumping (longer and slower). This may require variable frequency drives (VFDs) be installed on the Ranney Collector and WTP pumps.
- Increase alum and polymer dosing in response to increased turbidities. Will also need to use additional caustic to adjust pH.
- Increase chlorine dose in response to increase in specific pathogens or as a pre-oxidant to select contaminants.

While the chemical dosing options will result in higher chemical costs and increased solids handling, flow reductions may become a political and community concern. A proactive public relations and information campaign could help reduce customer strain. Extended operations could impact labor costs and may require capital investment for VFDs.

4.0 SUMMARY AND CONCLUSIONS

Review of the most recent rounds of sampling yielded no quantifiable impacts to be noted. There have been moderate storm events that occurred over the winter, which resulted in very turbid water. Based on conversations with City staff, the observed water quality (turbidity, pH, and alkalinity) has not been statistically outside the typical seasonal range. It does not appear that substantial sediment/organics migration or plugging of the Ranney Collector has occurred so far.

At this time, it is recommended that the City continue monitoring efforts over the next few seasons or years as a safeguard to help provide an early warning in case conditions change. The City could also consider updating their emergency response plan to incorporate potential responses and level of services goals to an impaired water quality event.

5.0 REFERENCES

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Attachment D – Stillwater Sciences, Inc. Technical Memorandum

City of Brookings Municipal Post-Fire Stabilization/Rehabilitation Assessment – Hydrology and Geomorphology Assessment, May 8, 2018.

Stillwater Sciences
108 NW Ninth Ave., Suite 200, Portland, OR 97209
phone 503.267.9006

TECHNICAL MEMORANDUM

DATE: May 8, 2018

TO: Ronan Igloria, GSI Water Solutions

FROM: Glen Leverich (Oregon Registered Geologist #2401)
Dylan Caldwell (Oregon Registered Geologist #2523)

SUBJECT: City of Brookings Municipal Watershed Post-Fire Stabilization/Rehabilitation Assessment - Hydrology and Geomorphology Assessment

In support of the City of Brookings' Municipal Watershed Post-Fire Stabilization/Rehabilitation Assessment (the "Assessment"), we present herein a report of methods and findings from our focused evaluation of potential post-fire changes in the runoff hydrology and channel morphology of the Chetco River.

1 INTRODUCTION

The purpose of the overall assessment has been to provide technical assistance to the City of Brookings to address potential effects on the City's water system following the recent Chetco Bar Fire that burned the majority of the Chetco River watershed in the summer and fall of 2017. The City draws its water supply from a Ranney Collector facility located on a floodplain alongside the lower Chetco River near the confluence with the North Fork Chetco River (Figure 1). Through an infiltration gallery, the collector withdraws shallow groundwater that has a direct hydrologic connection with the Chetco River. The City therefore identified a potential threat to its infiltration gallery and water-supply quality from anticipated changes in landscape runoff and sediment delivery following the large wildfire event. The project team was contracted by the City to conduct three primary tasks:

1. Assess water quality in the City's source water and potential treatment issues
2. Assess flow and channel conditions and potential scour and/or aggradation impacts to the infiltration gallery
3. Develop the "Wildfire Source Water Protection Sampling and Analysis Plan" (GSI 2018)

Stillwater Sciences was contracted by GSI Water Solutions, Inc. on behalf of the City to conduct the project's second task. Specific objectives of this task included the following:

- Develop and initiate a plan for assessing post-fire changes to runoff hydrology and channel morphology at and upstream of the infiltration gallery. The plan will primarily rely on establishing photo-log monitoring locations at discrete sections of the Chetco

River to identify visible changes in vertical and/or lateral channel adjustments. It is assumed that subsequent photo-log monitoring will be conducted by the City to further track the range of events and conditions.

- Analyze and interpret discharge measurements and field/photo observations to evaluate the potential for vertical and/or lateral channel changes that could affect the infiltration gallery.
- Review infiltration gallery current conditions and performance, and identify any additional field monitoring and analytical studies (*e.g.*, HEC-RAS or other modeling) to estimate long-term impacts.

2 ASSESSMENT

The assessment of potential post-fire changes in runoff hydrology and channel morphology was conducted through synthesis of literature review, field reconnaissance, and professional experience in the region. The assessment considers the potential effects of the Chetco Bar Fire of 2017 to rainfall-runoff dynamics, sediment-production (erosion) and sediment-delivery processes, and channel (in) stability. The U.S. Forest Service (USFS) recently published their Burned Area Emergency Response (BAER) reports for the Chetco Bar Fire (USFS 2017a,b), which served as important resources for this assessment. Our assessment is further informed by effects recorded by other researchers from two other past wildfires: Silver Fire of 1987 and Biscuit Complex Fire of 2002 (Figure 2). The following sections discuss the watershed's hydrology, geology, and land cover/use, as well as its wildfire history and potential effects to watershed runoff and channel morphology.

2.1 Watershed Setting

The Chetco River is the southern-most coastal watershed completely within the state of Oregon. It drains approximately 350 mi^2 (910 km^2) across the Klamath Mountains physiographic province, which is composed of sedimentary and ultramafic rocks that have been intruded by younger igneous rocks (Bishop 2006). The watershed remains largely undeveloped, with over 80% by land area federally managed as forest lands and wilderness (SCWC 2011). The topographic relief of the watershed ranges from about 5100 ft (1550 m) in the headwaters at Pearsoll Peak down to sea level near the city of Brookings. The mainstem river experiences perennial flow along much of its 57-mile (92-km) westward course from steep, canyon headwaters down to a low-lying, tidally influenced river-mouth at the Pacific Ocean. The river receives significant surface-water input from its major tributaries—South and North Fork Chetco rivers, Tincup, Boulder, Eagle, Box Canyon, Emily, and Mislatnah creeks, and Little Chetco River.

Large wildfires have become more common in recent decades, the three largest being the Silver Fire of 1987, Biscuit Complex Fire of 2002, and Chetco Bar Fire of 2017, which burned approximately 10%, 58%, and 68% of the watershed, respectively (Figure 2; see Section 2.1.5–Wildfires below).

The salient dimensions of the watershed and its major tributary subwatersheds are summarized in Table 1.

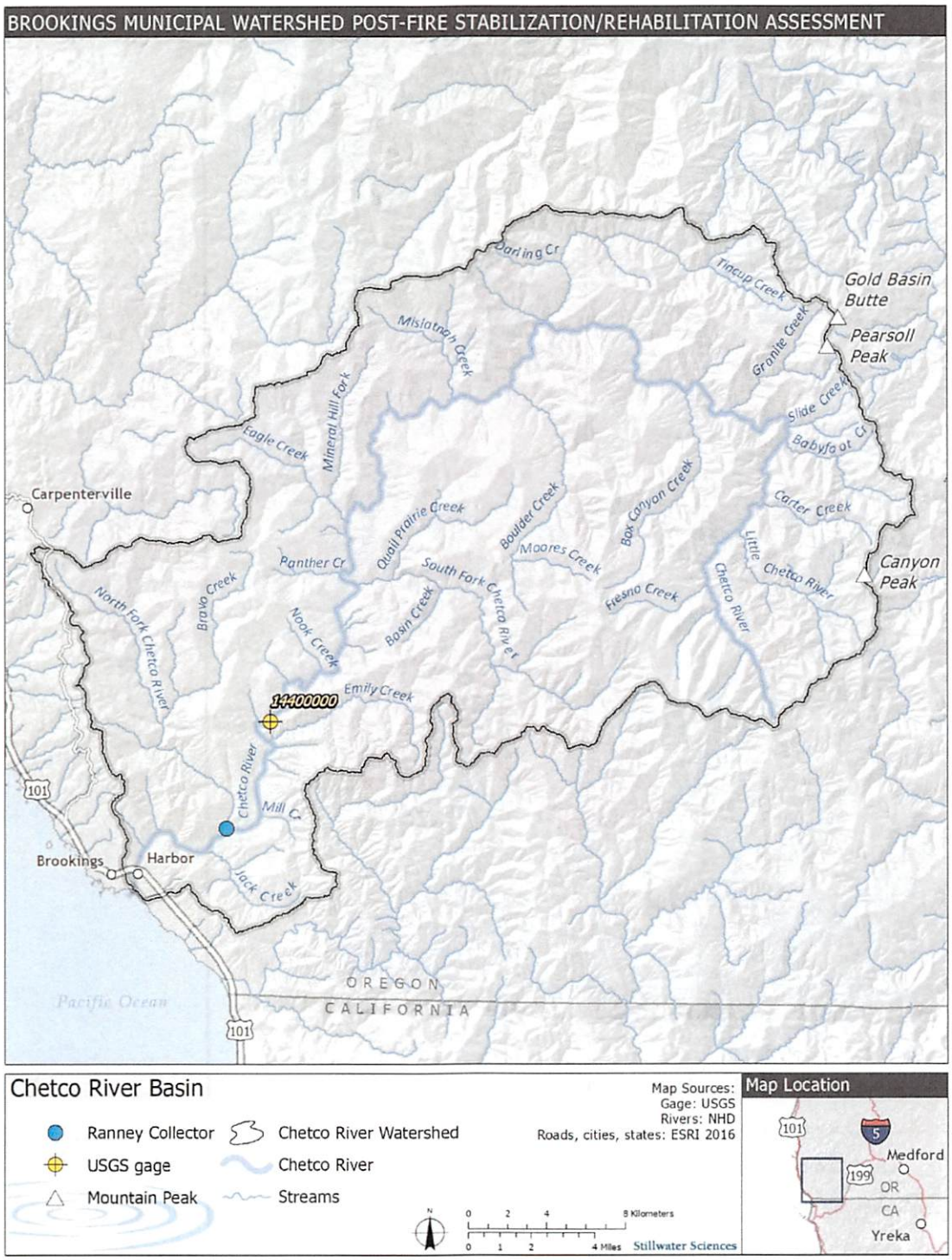

Figure 1. Base map of the Chetco River watershed in Curry County, Oregon.

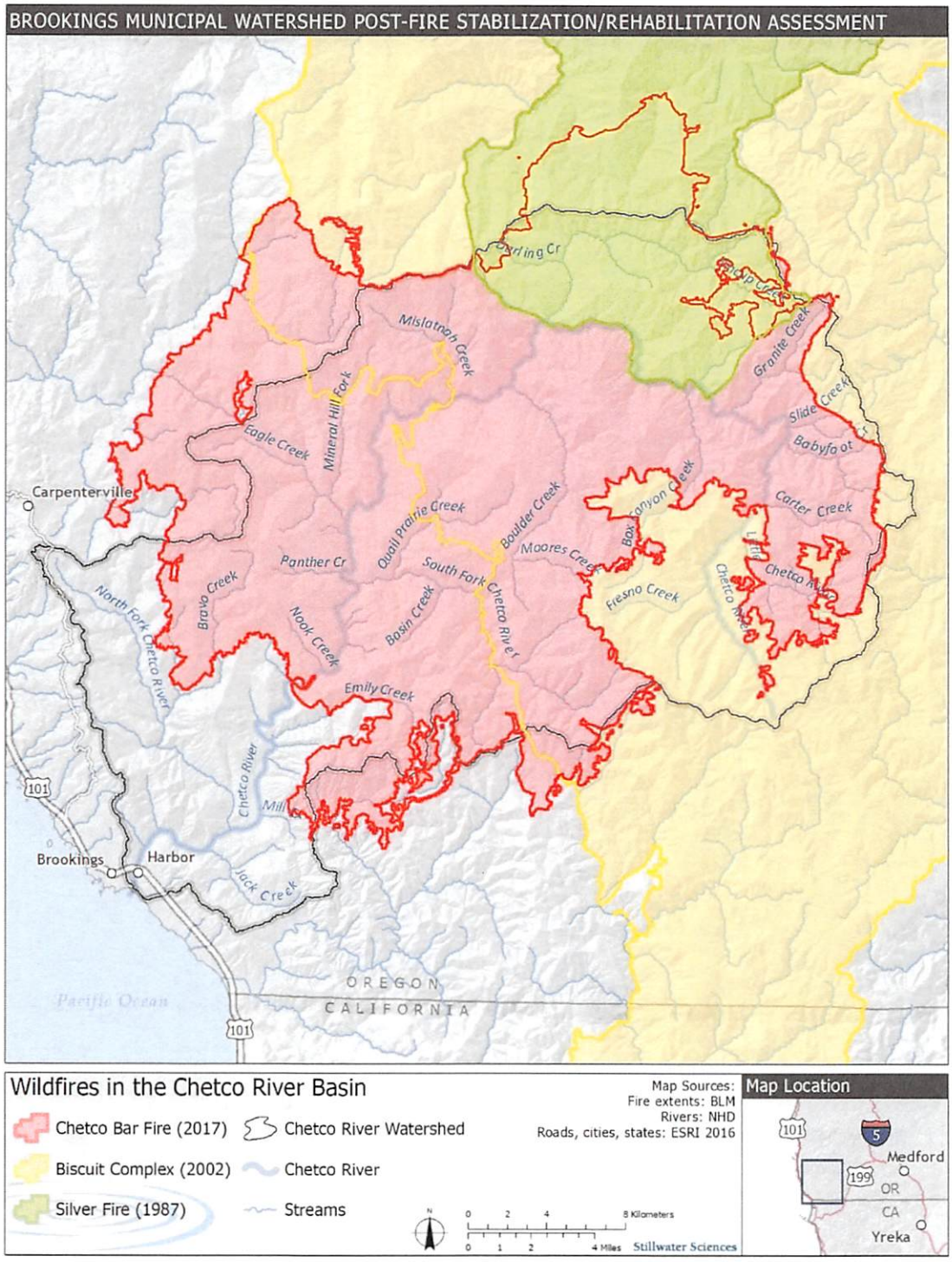

Figure 2. Largest wildfires recorded in the Chetco River watershed since the early 20th century (source data from BLM 2017; analysis by Stillwater Sciences).

Table 1. Physical dimensions of the Chetco River watershed.

Watershed and major tributaries [A]	Drainage area [B]		Stream relief (elev. range) [C]		Stream length [D]		Stream gradient [E]
	mi^2	km^2	ft	m	mi	km	
Chetco River	350	910	3370	1027	57	92	0.011
So. Fk Chetco R.	45	117	2390	728	14	22	0.033
No. Fk Chetco R.	40	104	1310	399	13	21	0.019
Tincup Cr.	28	72	3460	1055	13	20	0.052
Boulder Cr.	22	57	1980	604	9.6	16	0.039
Eagle Cr.	21	53	2000	610	6.0	9.6	0.063
Box Canyon Cr.	15	39	3010	917	9.1	15	0.063
Little Chetco R.	14	36	2040	622	6.5	10	0.060
Emily Cr.	13	32	1270	387	7.7	12	0.031
Mislatnah Cr.	11	29	2420	738	5.1	8.2	0.090

Table footnotes:

[A] Drainages larger than 10 square miles (mi^2)

[B] Drainage area of subwatershed derived in a GIS using the USGS's National Hydrography Dataset

[C] Stream channel relief determined in a GIS using maximum and minimum elevations of the designated mainstem channel contained in the USGS's National Hydrography Dataset overlain upon a 10-m digital elevation model of the watershed

[D] Stream channel length determined in a GIS using stream segments in the USGS's National Hydrography Dataset

[E] Stream channel gradient determined in a GIS using the quotient of stream channel relief and length

Abbreviations: R.=river, Cr.=creek, mi^2=square mile(s,) km^2=square kilometer(s), ft=foot/feet, m=meter(s), mi=mile, km=kilometer

2.1.1 Climate

The Chetco River watershed experiences a Pacific marine climate resulting in wet winters and dry summers (USACE 1893 as cited in Wallick *et al.* 2010). Air temperatures vary seasonally and with elevation and proximity to the coast, based on long-term atmospheric recordings at two monitoring stations positioned at difference locations in the watershed (Brookings near the coast at 25 ft elevation and Quail Prairie Lookout near Boulder Creek in upper watershed at 920 ft) (NOAA NCDC 2018). The monthly mean maximum and minimum temperatures have occurred in July–September and December–January, respectively (Figures 3a,b, left-panel plots). The long-term atmospheric recordings reveal a steady, albeit statistically weak ($R^2 \approx 3–20\%$), increase in annual mean minimum values (Figures 3a,b, right-panel plots), equating to about +1°F (+0.6°C) over the past half-century. Regional observations of air temperatures report annual mean increases of about 1.5°F (0.8°C) over the last century, and a predicted temperature rise of an additional 3 to 8°F by the end of this century (*e.g.*, USGCRP 2014). Increasing air temperatures will likely cause changes to the Chetco River watershed's hydrology, possibly leading to decreased snowpack, decreased soil moisture, increased drought severity, changed forest structure and function, and increased wildfire frequency and severity (*e.g.*, USFS 2012).

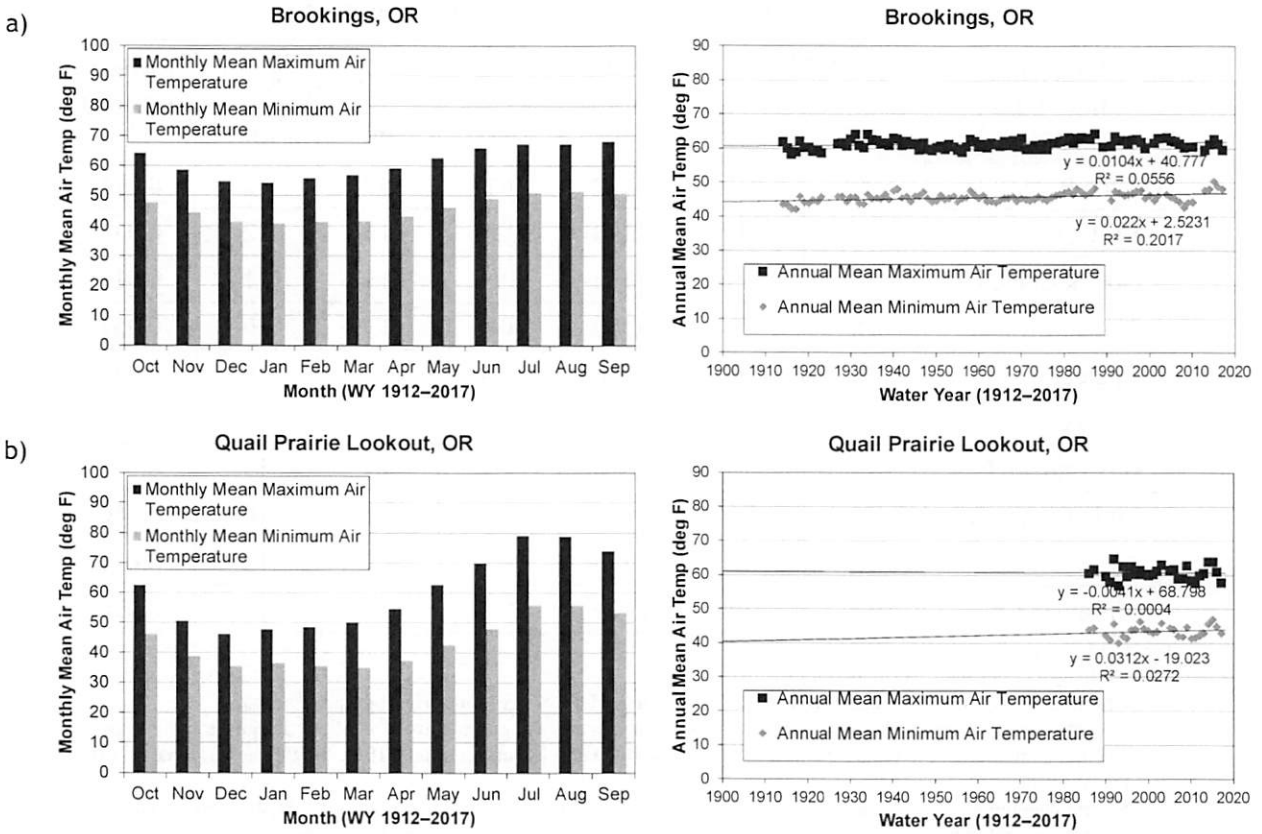

Figure 3. Long-term monthly mean air temperature (left panels) and annual mean air temperatures (right panels) recorded at the Brookings (a) and Quail Prairie Lookout (b) atmospheric monitoring stations in the Chetco River watershed (source data from NOAA NCDC 2017; analysis by Stillwater Sciences). Only years with mean daily values reported for at least 330 days (>90% of water year) were included in the plots.

The watershed receives high rainfall associated with its climate and physiographic setting. Across the entire watershed, annual mean precipitation has ranged between 74 and 167 in (187 and 424 cm) during the years 1981–2010, as reported by the U.S. Department of Agriculture (PRISM 2017). At higher elevations, winter precipitation falls as snow that persists through spring. A clear pattern of increased rainfall with elevation is expressed across the watershed, as the valley bottom and coastal plain areas receive less than half the precipitation received in the headwaters. These trends can be observed in precipitation records from long-term atmospheric monitoring stations near the city of Brookings (Figure 3a,b, left-panel plots) (NOAA NCDC 2018). There are no long-term precipitation recordings with recent data monitored elsewhere in the watershed.

Following the pattern of local air temperatures, the wettest months in the watershed have been December–January while the driest have been July–September. Total annual precipitation (Figure 4a) exhibits substantial variability over time, ranging over a factor of two. Longer-term cyclic patterns of precipitation in the watershed can be visualized when plotting the cumulative departure, or difference, of each annual total from the long-term average of annual totals (Figure 4b). The time-series of cumulative departures of annual precipitation records reveal decadal-scale

patterns of generally wetter than average (*i.e.*, gaining trend) and drier than average (*i.e.*, losing trend) in the watershed.

A recent wetter period since the mid-1990s can be inferred from the plotted trends. Two of the largest wildfires recorded in the watershed—Biscuit Complex and Chetco Bar fires—both occurred during this recent wetter period (Figure 4a, Table 2). Predictions of precipitation patterns in response to climate change in the region are varied, but overall they indicate a likely decrease in annual total snowfall, earlier snowmelt timing, and increased drought (*e.g.*, USFS 2012, USGCRP 2014).

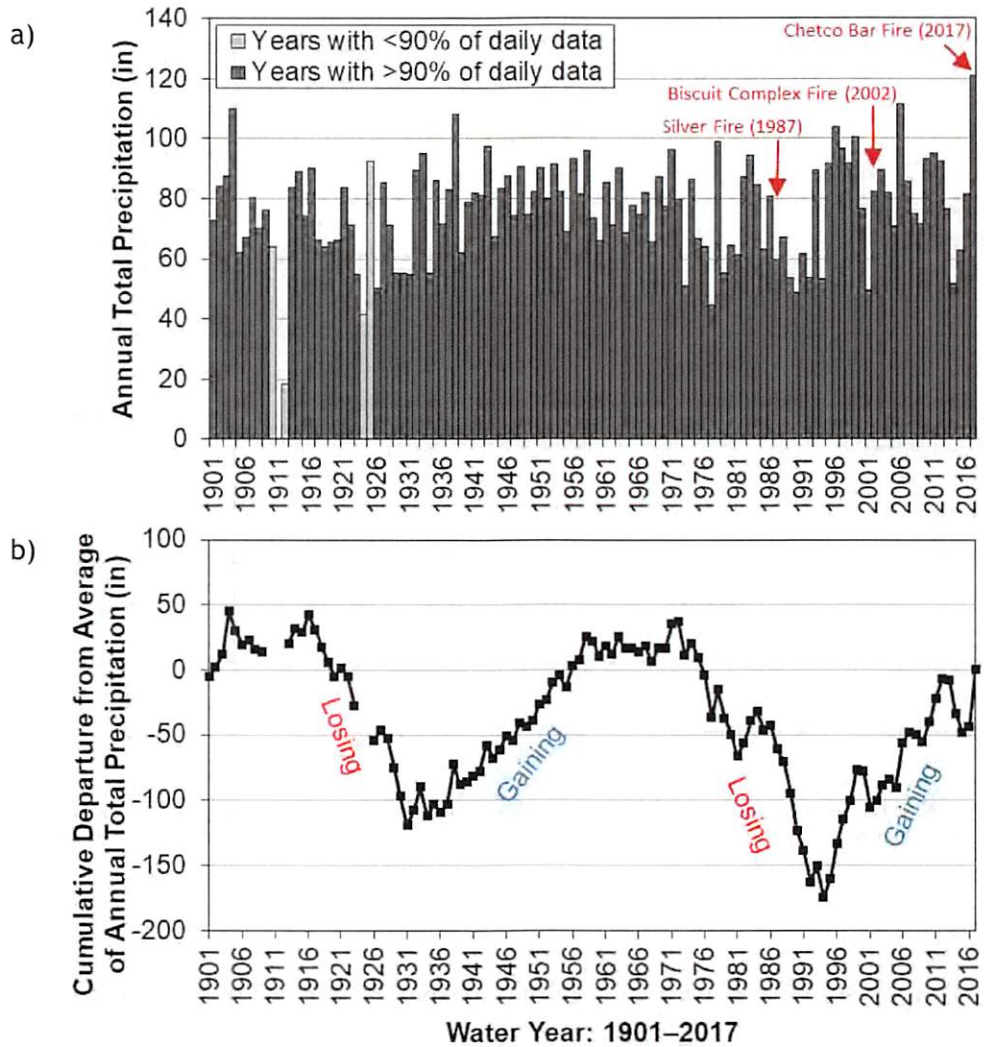

Figure 4. Long-term annual total precipitation amount (a) and patterns of variation from cumulative departures from average of annual total precipitation amounts (b) recorded at atmospheric monitoring stations in the vicinity of Brookings, Oregon (source data from NOAA NCDC 2018; analysis by Stillwater Sciences). Only years with mean daily vales reported for at least 330 days (>90% of water year) were included in the cumulative departure plot (b).

Table 2. Hydrologic conditions during initial three years following large wildfire events.

Parameter [A]	Water-years following wildfire event	Wildfire event [B]		
		Silver Fire (1987)	Biscuit Complex Fire (2002)	Chetco Bar Fire (2017) [C]
Maximum daily precipitation in water-years following event (in)	1st WY	2.1 (WY 1988)	3.3 (WY 2003)	2.3 (WY 2018; On 11/23/2017)
	2nd WY	2.0 (WY 1989)	4.2 (WY 2004)	TBD
	3rd WY	1.6 (WY 1990)	2.7 (WY 2005)	TBD
Maximum daily mean flow in water-years following event (cfs)	1st WY	27,800 (WY 1988)	26,100 (WY 2003)	12,600 (WY 2018; on 1/24/2018)
	2nd WY	30,200 (WY 1989)	35,200 (WY 2004)	TBD
	3rd WY	29,400 (WY 1990)	37,700 (WY 2005)	TBD
Annual peak flow in water-years following event (cfs)	1st WY	36,600 RI≈1.8 yr (WY 1988)	36,800 RI≈1.8 yr (WY 2003)	17,100 RI≈1.1 yr (WY 2018; on 1/24/2018)
	2nd WY	39,800 RI≈2 yr (WY 1989)	45,500 RI≈3 yr (WY 2004)	TBD
	3rd WY	49,300 RI≈4 yr (WY 1990)	48,200 RI≈4 yr (WY 2005)	TBD

Table footnotes:

[A] Daily precipitation records from NOAA NCDC 2018 and daily mean and annual peak discharge records from USGS 2018; analyses by Stillwater Sciences

[B] Abbreviations: WY=water year; TBD=to be determined; RI=recurrence interval

[C] Water-year 2018 is underway; data considered following the Chetco Bar Fire are from 10/1/2017 through 3/15/2018; the date of the highest recorded value during this period is provided for reference

Abbreviations: in=inch(es), cfs=cubic feet per second, WY=water year, TBD=to be determined

2.1.2 River flow

Discharge in the Chetco River is sourced from a combination of storm- and snowmelt-related runoff, and groundwater-sourced baseflow (USFS 1996, SCWC 2001). Surface-water stage and discharge have been monitored in the watershed continuously since water-year 1970 (*i.e.*, October 1, 1969 and onward) by the U.S. Geological Survey (USGS). The gage (#14400000) is located upstream of the river's confluence with Emily Creek, recording runoff from approximately 270 mi^2 (77%) of the entire watershed (see Figure 1). The river and its major tributaries—South and North Fork Chetco rivers; Tincup, Boulder, Eagle, Box Canyon, Emily, and Mislatnah creeks; and Little Chetco River—have perennial flow along much of their lengths

during most water years. In drought years, intermittent flows occur in the uppermost reaches (USACE 1893 as cited in Wallick *et al.* 2010, USFS 1996, SCWC 2001).

The watershed's seasonal hydrologic regime is well apparent in examination of monthly mean discharge recorded at the USGS gage (Figure 5). Over the long-term record, December and January have experienced the highest monthly mean flows while July–September have experienced the lowest. These patterns closely follow seasonal variability of precipitation in the watershed. Annual total runoff relates well ($R^2 \approx 76\%$) to annual total precipitation during water-years 1970–2017 (Figure 6). Also plotted in Figure 6 are the annual total runoff amounts versus annual total precipitation amounts during the initial three years following the Silver Fire in 1987 and Biscuit Complex Fire in 2002 (shown in orange and red, respectively), which together reveal a lack of distinguishable pattern from the total 48-year record (*i.e.*, no clustering of post-fire data), indicating that the rainfall-runoff relationship during those fire-recovery years exhibited no unusual patterns (see additional discussion in Section 2.4–Wildfire below).

Daily mean flows have been about 2,300 cfs on average over the past 48 years (Table 3). Overall, for 90% of the time, daily mean flows in the river have been less than about 6,000 cfs at the gage. Daily mean flows recorded during the initial three years following recent wildfire events have been moderate, with maximum values all being well below the long-term maximum daily mean flow recorded at the station (see Table 2).

In comparison with the daily mean flows, annual peak flows over the past 48 years have been substantially greater (*e.g.*, 2,300 cfs versus ~80,000 cfs) (Figure 7). The largest floods recorded in the river occurred in water years 1965, 1971, and 1997. The largest flood peaked at 85,400 cfs on December 22, 1964, which has an estimated return period of greater than 100 years (Table 4). Annual peak flows recorded during the initial three years following recent wildfire events have been relatively small, the largest of which having a 4-year recurrence interval (*i.e.*, a 4-year flood) (see Table 2). While the current water-year is in-progress, the annual peak flow since the Chetco Bar Fire has only reached a value equating to a 1.1-year flood event (see additional discussion in Section 2.4–Wildfire below).

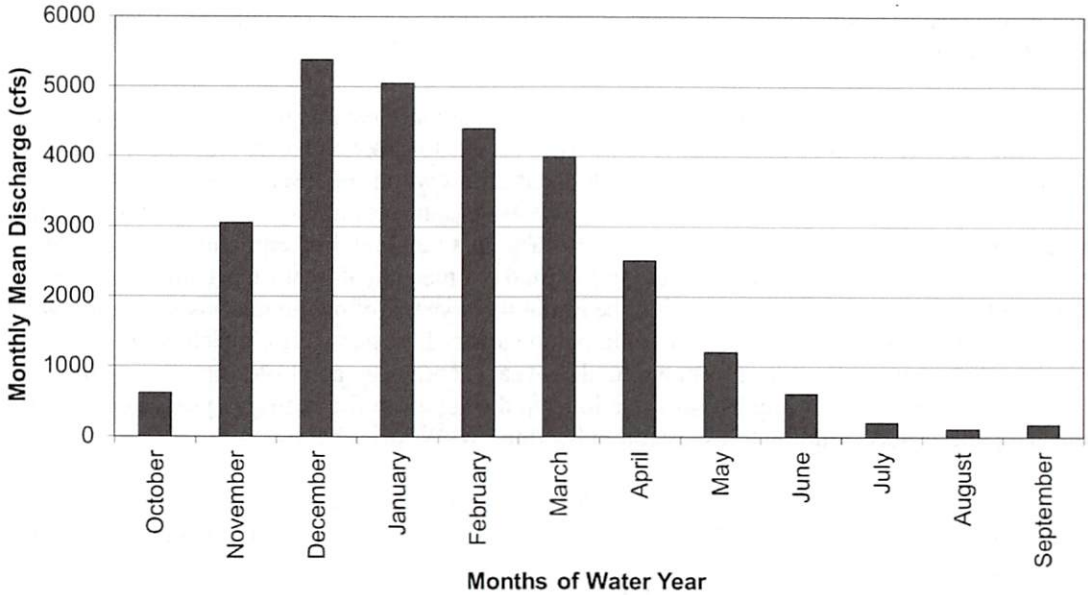

Figure 5. Monthly mean discharge characteristics of the Chetco River based on compilation of available long-term gaging records from water years 1970-2017 (source data from USGS 2018; analysis by Stillwater Sciences).

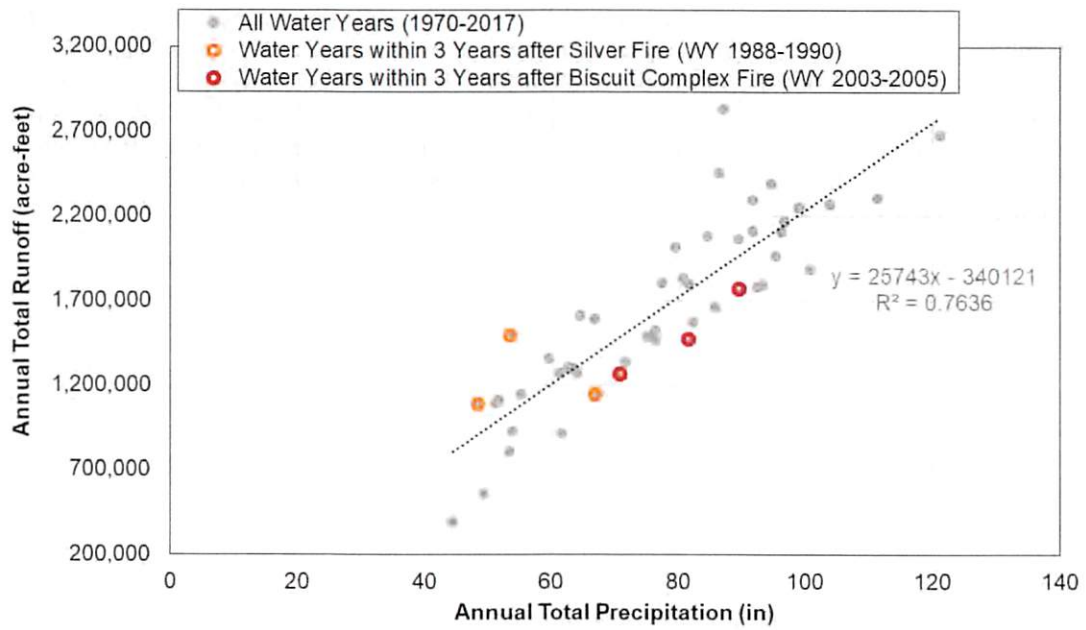

Figure 6. Relationship of annual total runoff as measured at the USGS streamflow gage versus annual total precipitation as measured near Brookings during water-years 1970-2017 (source data from USGS 2018 and NOAA NCDC 2018; analysis by Stillwater Sciences). Water years within three years after the 1987 Silver Fire and the 2002 Biscuit Complex Fire are also shown.

Table 3. Daily mean flow statistics of the Chetco River based on compilation of available long-term gaging records from water years 1970-2017 (source data from USGS 2018; analysis by Stillwater Sciences).

Parameter			Stream Gage Location: Chetco River near Brookings
Period of Record	Dates		10/1/1969–9/30/2017
	Water Years		1970–2017
Number of Readings			17,532
Flow (cfs)	Mean		2,268
	Standard Deviation		3,900
	Minimum		28
	Time of Exceedance (%)	100%	28
		90%	83
		80%	127
		70%	226
		60%	430
		50%	807
		40%	1,330
		30%	2,110
		20%	3,340
		10%	6,050
		5%	9,504
		1%	19,500
		0.1%	35,527
		0.01%	57,000
	Maximum		57,000

Abbreviation: cfs=cubic feet per second

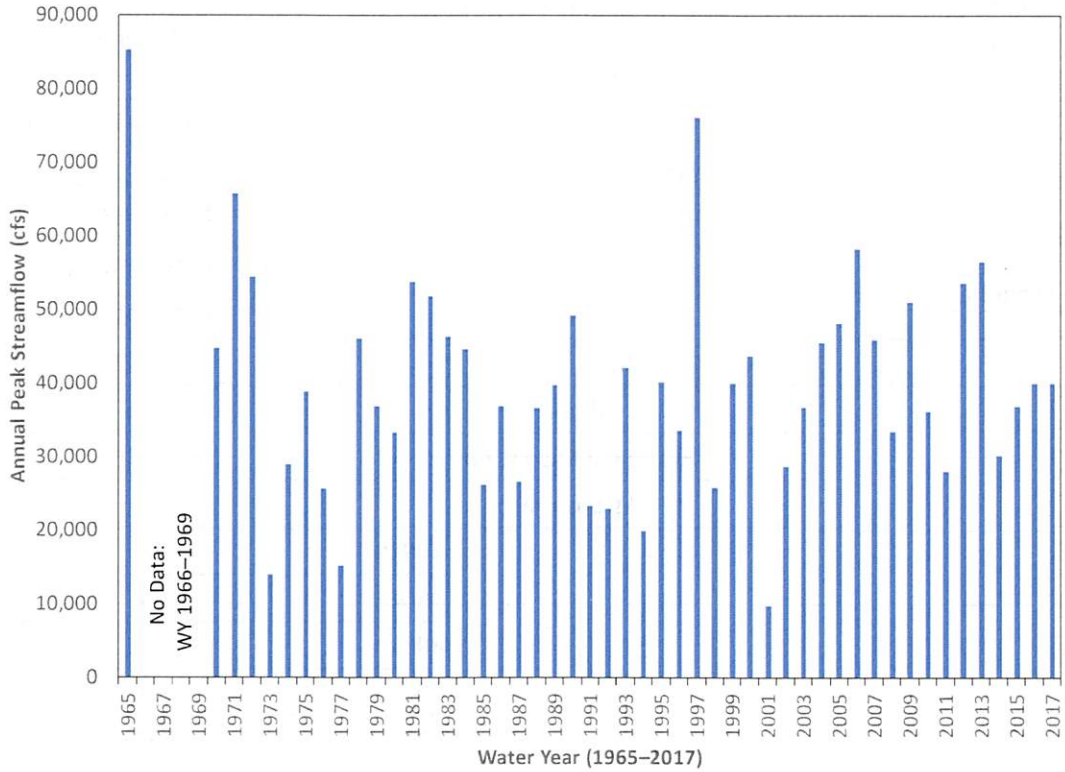

Figure 7. Historical annual peak discharge of the Chetco River based on compilation of available long-term gaging records from WY 1965-2017 (source data from USGS 2017; analysis by Stillwater Sciences).

Table 4. Flood frequency statistics based on historical annual peak discharge of the Chetco River from WY 1965-2017 (source data from USGS 2017; analysis by Stillwater Sciences).

Return Period (years)	Exceedance probability (%)	Discharge (cfs)
1.2	83%	26,700
2	50%	38,700
5	20%	52,500
10	10%	60,200
20	5%	66,500
50	2%	73,600
100	1%	78,200
200	0.5%	82,300
500	0.2%	87,000
1000	0.1%	90,200

Abbreviation: cfs=cubic feet per second

2.1.3 Geology and geomorphology

The rugged landscape of the Chetco River watershed is a product of tectonic processes that affixed several geologic terranes to western North America during the late Mesozoic era and early Tertiary period (Walker and MacLeod 1991, Bishop 2006, Wallick *et al.* 2010). The western two-thirds of the watershed is predominately composed of slightly metamorphosed sedimentary rocks of the Dothan Formation (unit "KJds" in Figure 8), whereas the eastern third of the watershed is predominately composed of older, highly deformed metamorphic rocks and intrusive igneous rocks described collectively by Walker and MacLeod (1991) as ultramafic and related rocks of ophiolite sequences (units "Ju," "Jv," and "JTRgd" in Figure 8). Soils in the watershed are primarily sandy, silty, and clayey loams of varying depths depending on parent material (*i.e.*, sedimentary versus ultramafics), ground-surface slope and aspect, and land uses (NRCS 2018). The Chetco Bar Fire burned areas primarily underlain by sedimentary rocks of the Dothan Formation, whereas the Biscuit Complex Fire burned a nearly even mix of the Dothan Formation rocks and the older ultramafic and intrusive igneous rocks (USFS 2017b) (see Figures 2 and 8).

Past researchers have found that the combination of geologically recent uplift, estimated at 1–4 mm/yr, and erodible rock types have shaped the watershed's steep slopes, high drainage density, and high coarse-sediment transport rates (*e.g.*, Ramp 1975, Wallick *et al.* 2010). While the geologic mapping depicted below in Figure 8 lacks details on landslide deposits, likely an artifact of the small scale at which the map information was documented, the Oregon Department of Geology and Mineral Industries classifies most of the watershed as having "moderate" to "high" landsliding potential (DOGAMI 2018). Coarse alluvial deposits sourced from the upper watershed are found along the lower river valley, within which the City's water-supply collector is located. Filling of the valley is expected to persist as the landscape continues to adjust to sea-level rise (*e.g.*, Wallick *et al.* 2010).

The mainstem Chetco River can be delineated into three geomorphic reaches: a steep, bedrock-bounded and canyon-confined mountain channel functioning primarily as a sediment-supply and sediment-transport reach (upstream of river-mile 19, which lies upstream of South Fork Chetco River in the Rogue-Siskiyou National Forest); a slightly wider, wandering alluvial channel with bar-pool morphology transitioning between a sediment-transport and sediment-deposition reach (between RMs 19 and 2); and a tidally influenced estuary channel (between RMs 2 and 0 in the harbor) (Wallick *et al.* 2010). The City's Ranney Collector, near the river's confluence with the North Fork Chetco River, is situated in the second reach type, where the mainstem exhibits a single-thread, gravel-bedded channel that migrates laterally within the narrow confines of the lower valley.

The USGS (Wallick *et al.* 2010, Wallick and O'Conner 2011) recently completed a multi-year study of channel change and sediment transport along the lower river (*i.e.*, RMs 0–19), wherein they found decadal adjustments in gravel-bar positions, channel sinuosity, and bed elevations associated with natural landscape evolution and man-made changes to sediment supply. They described the upper end of their study area as primarily a sediment-transport zone, with stable gravel-cobble bars providing transient storage of bed material (*i.e.*, coarse sand to cobble-sized clasts). The lower end of their reach, including near the City's Ranney Collector, are zones of active sedimentation and channel migration. The study found evidence of a ~30% reduction in gravel-bar area and a slight decrease in channel sinuosity, both potentially due to historic gravel-bar mining, and unchanged channel widths during the period of 1939–2008. The river segment near the North Fork confluence, near the Ranney Collector, was found to exhibit the greatest amount of lateral adjustment during this period, where the active channel has migrated across the

entirety of the valley bottom and its meander bend has shifted gradually closer towards the Ranney Collector (Figure 9). Channel-bed lowering was also detected, having occurred between 1977 and 2008 in response to large floods and/or instream gravel mining.

Measurement of sediment-particle sizes in the USGS study (Wallick *et al.* 2010) found a systematic coarsening of the river's gravel bars in the downstream direction until the North Fork Chetco River confluence (RM 8.5); thereafter, the gravel bars steadily become finer downstream. The gravel bar at the North Fork confluence, near to the Ranney Collector, exhibited some of the river's largest particle sizes, having a median diameter (D_{50}) of 39 mm (*i.e.*, very coarse gravel), with sizes above (D_{84}) and below (D_{16}) the median to be 97 mm (*i.e.*, cobble) and 16 mm (*i.e.*, medium gravel), respectively. Mean annual influx of bed material to the lower river from the upper watershed was estimated to be about 40,000 to 100,000 cubic meters per year (m^3/yr; ~1.4–3.5 million cubic feet per year [ft^3/yr]), with 5–30% of this bed-material load lost to particle degradation and subsequent delivery to the ocean or overbank floodplains by suspended-load transport. The proportion of bed-material delivered from the upper watershed but lost by these processes is assumed to be largely balanced by bed material supplied by tributaries to the lower river, namely Emily Creek and the North Fork Chetco River.

Additional description of the river morphology near the North Fork confluence is presented below in Section 2.2–Field Reconnaissance.

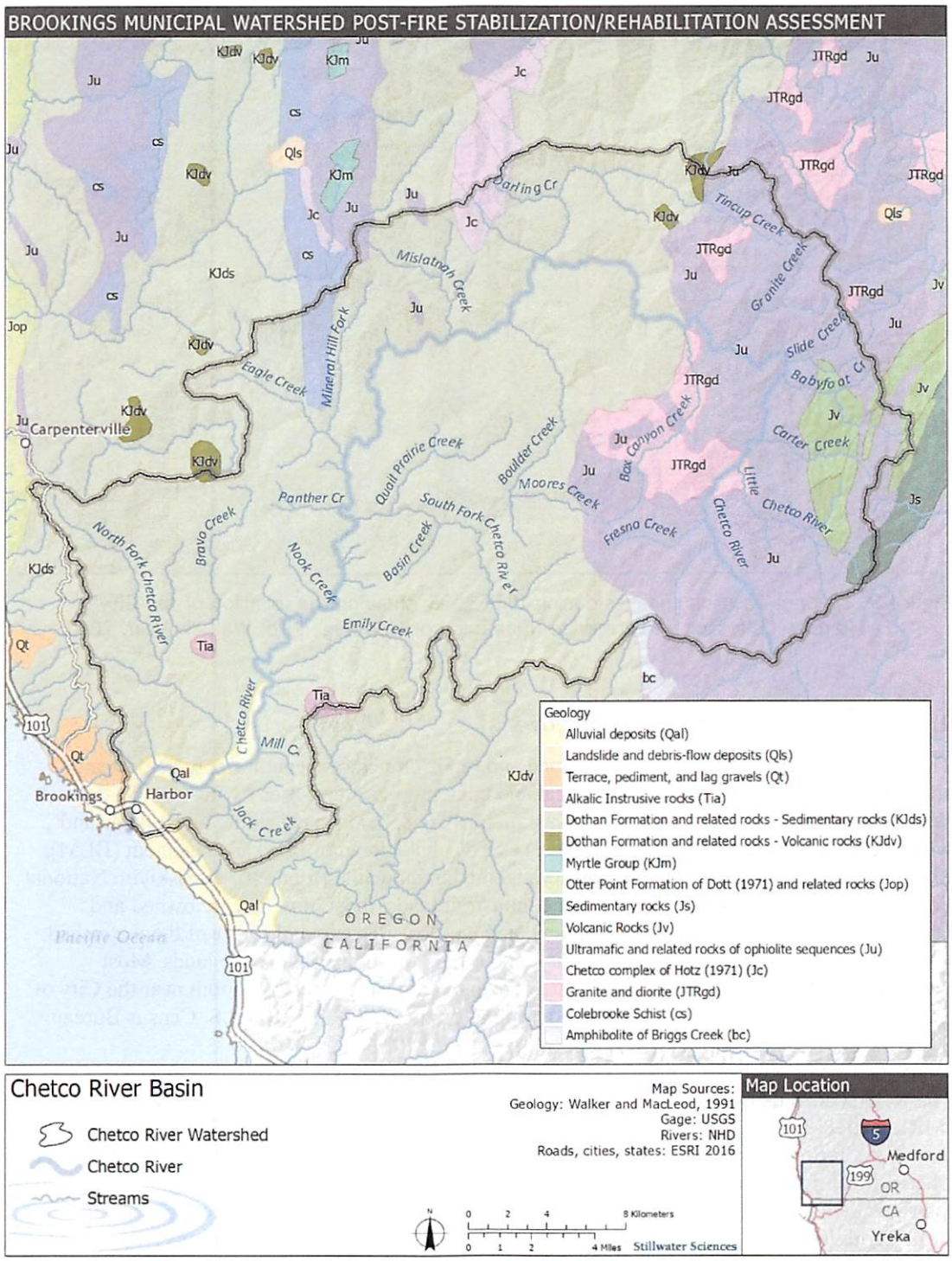

Figure 8. Geology of the Chetco River watershed and vicinity (source data from Walker and MacLeod 1991; cartography by Stillwater Sciences).

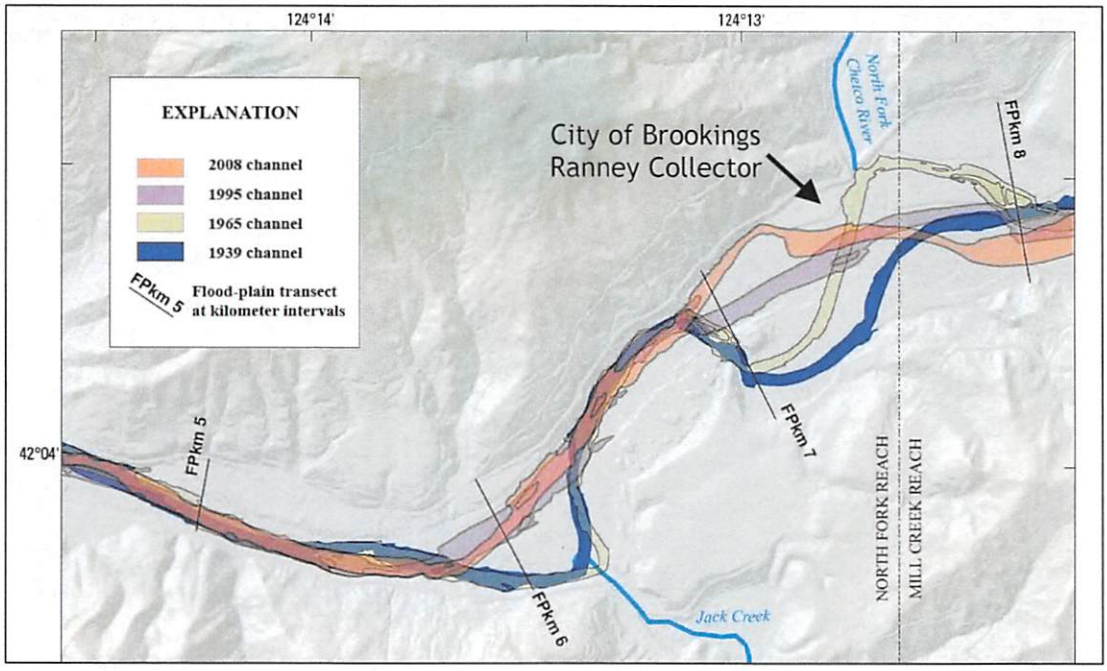

Figure 9. Channel-position changes during 1939-2008, showing the location of the City's Ranney Collector for reference (map excerpt from Fig. 13 of Wallick *et al.* 2010).

2.1.4 Land use and vegetation cover

The watershed remains greatly undeveloped and retains much of its natural, pre-settlement attributes, based on evaluation of historical and contemporary land-uses by the South Coast Watershed Council (SCWC 2011). The vast majority (~83%) is managed as forest lands and wilderness areas by the U.S. Forest Service (USFS) and Bureau of Land Management (BLM). These federal lands, situated in the upper watershed, include the Rogue River-Siskiyou National Forest and Kalmiopsis Wilderness. Private industrial lands, most of which are owned and managed by South Coast Lumber Company, account for approximately 11% of the watershed. The balance is owned by state, county, city, and other non-industrial private lands. Most industrial and residential developments are concentrated near the river's mouth near the City of Brookings and town of Harbor (combined population of ~8,700 in 2010 [U.S. Census Bureau 2018]).

The watershed is densely forested, as mapped in the National Land-Cover Database for 2011 (MRLC 2018; Figure 10). The dominant land-cover category is "evergreen forest" (70% by total land area), followed by smaller proportions of "shrub/scrub" (14%) and "mixed forest" (8%). The Chetco Bar Fire predominately burned lands hosting evergreen forest cover. Only about 3% of the watershed is covered by "developments," which range from open-space to high-density. The shrub/scrub land cover is strongly associated with the ultramafic rocks in the upper watershed (compare Figures 9 and 10), a phenomenon explained by the thinner and clay-rich soils formed by such rocks that are less accommodating (*e.g.*, toxic) to conifers endemic to the region (Alexander *et al.* 2007).

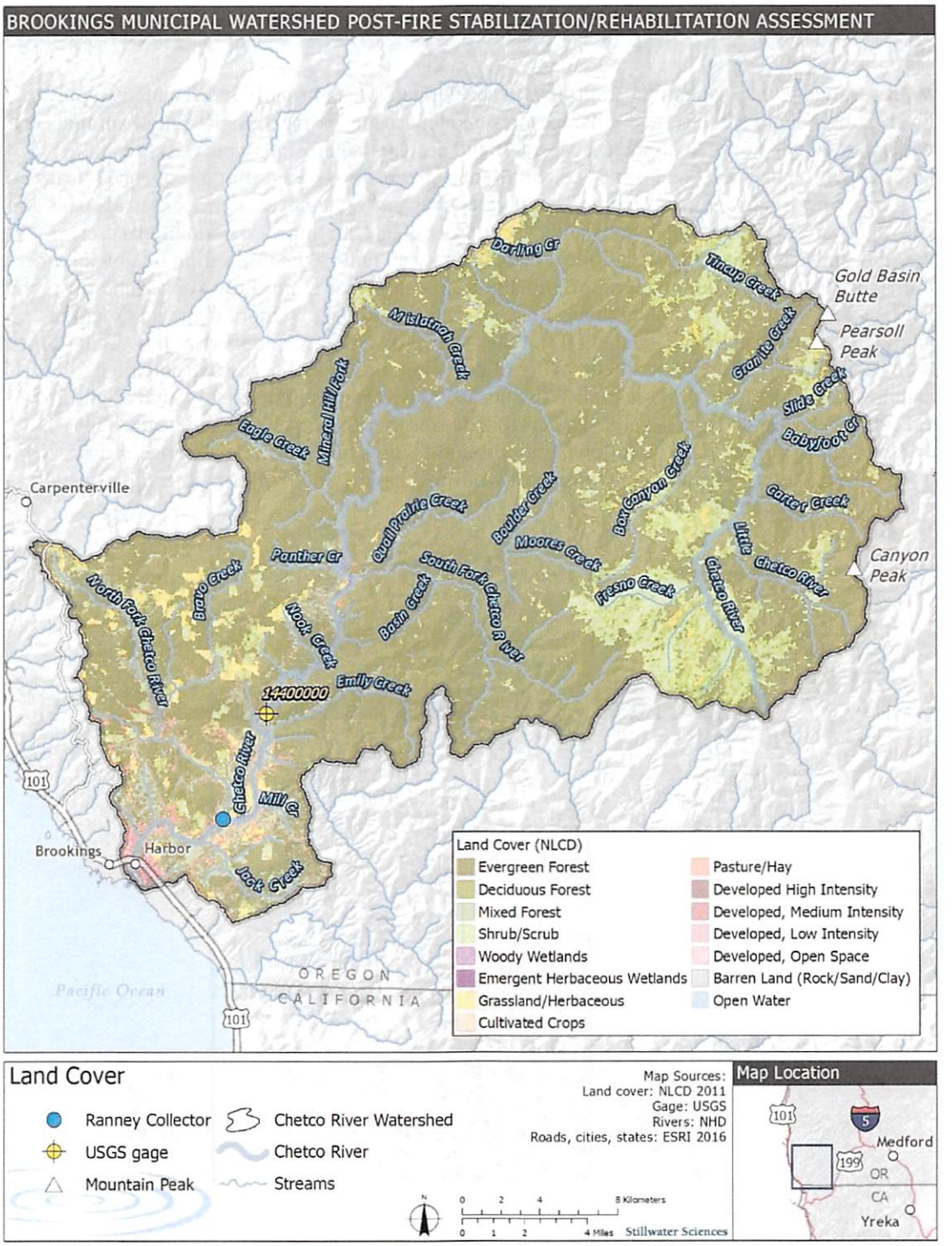

Figure 10. Land cover in the Chetco River watershed (source data from MRLC 2018; cartography by Stillwater Sciences).

2.1.5 Wildfires

Wildfire legacy

Wildfires in any landscape often contribute to accelerated rates of runoff and sediment supply during subsequent years. Burned hillslopes in steep landscapes prone to high rainfall amounts can respond to winter storms with increased runoff and accelerated erosion, which may result in debris flows, landslides, floods, and sediment-laden streamflow—a fire-flood sequence (Neary *et al.* 2005). Specific fire impacts include both direct changes to the physical properties of rocks and soil, and changes to hydrologic and geomorphic process rates until pre-fire conditions are reestablished (Shakeby and Doerr 2006). The changes can reduce the infiltration rate by an order of magnitude, shift the dominant runoff process from subsurface storm flow to overland flow, and increase peak flows and sediment yield (fine and coarse particles) by more than two orders of magnitude (Larsen and MacDonald 2007). Rates of soil disturbance and increased overland flow often decline rapidly following the first year of post-fire rains, which leads to a so-called "window of disturbance" (Prosser and Williams 1998) that begins immediately after a wildfire and can vary in length from several seconds to a decade, depending on fire and watershed characteristics (Figure 11). The following discussion focuses on post-fire disturbances observed in the Chetco River watershed following past wildfires that may help inform potential effects following the Chetco Bar Fire of 2017.

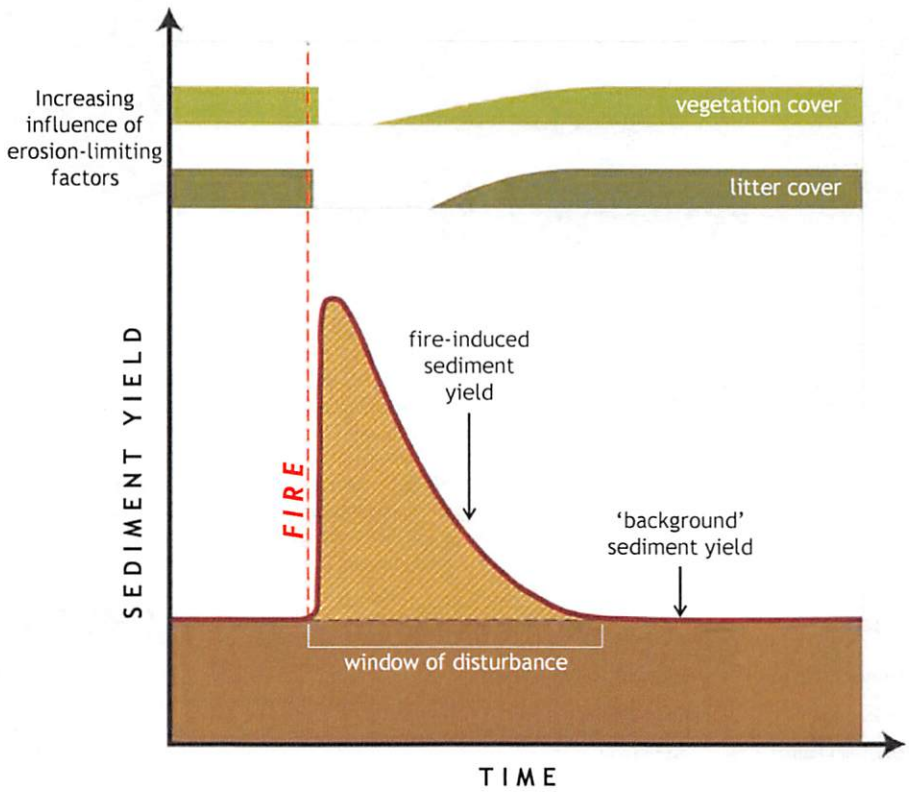

Figure 11. Conceptualization of sediment yield and associated vegetation and litter recovery during the fire-induced "window of disturbance" (adapted from Shakesby and Doerr 2006).

Over the past century, more than half of the Chetco River watershed has been burned by wildfire. There have been at least 28 wildfires recorded in the watershed since the early 20th century (BLM 2017), the four largest (>10 mi^2) are summarized in Table 5 (see also Figure 2). Fire frequency has been greatest near the highest elevation, and most remote, areas of the upper watershed (Figure 12). These more-frequently burned areas host a mix of "evergreen forest" and "shrub/scrub" vegetative cover and are underlain by ultramafic rocks (see Figures 8 and 10).

Table 5. Large wildfires (>10 mi^2) within the Chetco River watershed since the early 20th century (source data from BLM 2017; analysis by Stillwater Sciences).

Wildfire name	Recorded year	Wildfire description			
		Total Area (mi^2)	Area within Chetco River watershed (mi^2)	Proportion of watershed (%)	Location of watershed burned
unnamed	1936	14	10	3%	Eastern corner near Canyon Peak
Silver	1987	153	37	10%	Northeastern corner near Tincup Creek
Biscuit Complex	2002	781	203	58%	Eastern half (*2nd largest wildfire recorded in Oregon*)
Chetco Bar	2017	299	239	68%	Majority of watershed east of N.F. Chetco River

Abbreviation: mi^2=square mile(s)

The three most recent, and largest, wildfires are the Silver Fire of 1987, Biscuit Complex Fire of 2002, and the Chetco Bar Fire of 2017 (Table 5, Figure 2). Post-fire monitoring and treatment efforts conducted by the USFS and others consistently observed the fires burned heterogeneously, leaving a mosaic of live and dead vegetation, being primarily conifer and hardwood (tanoak) forest (Thompson *et al.* 2007, USFS 2017a,b). Following the Silver Fire, several changes were observed: (1) surface ravel of burned soils was prevalent along the inner gorges of tributaries and the headwaters of the Chetco River; (2) riparian shade in the headwater streams was reduced by <60%, though water temperatures were unaffected (2) streamflow, turbidity, and sediment deposition in receiving waters were unaffected; (3) vegetation regrowth in burned and timber-salvaged areas was strong; and (4) fish habitat and population were not adversely affected (USFS 1995). The Biscuit Complex Fire—Oregon's second largest recorded wildfire—led to similar effects in the watershed, in addition to the following: (1) organic layer of the soil column was often obliterated in high-burn areas; (2) soil erosion was concentrated on burned surfaces, but sediment accumulation in roadside ditches and other topographic depressions was largely absent; (3) understory growth and conifer regeneration occurred rapidly; and (4) areas unaffected by the 1987 Silver Fire burned at lower severities in 2002, while areas salvage-logged and planted after the 1987 Silver Fire burned more severely than comparable unmanaged areas (Bormann *et al.* 2005, Thompson *et al.* 2007).

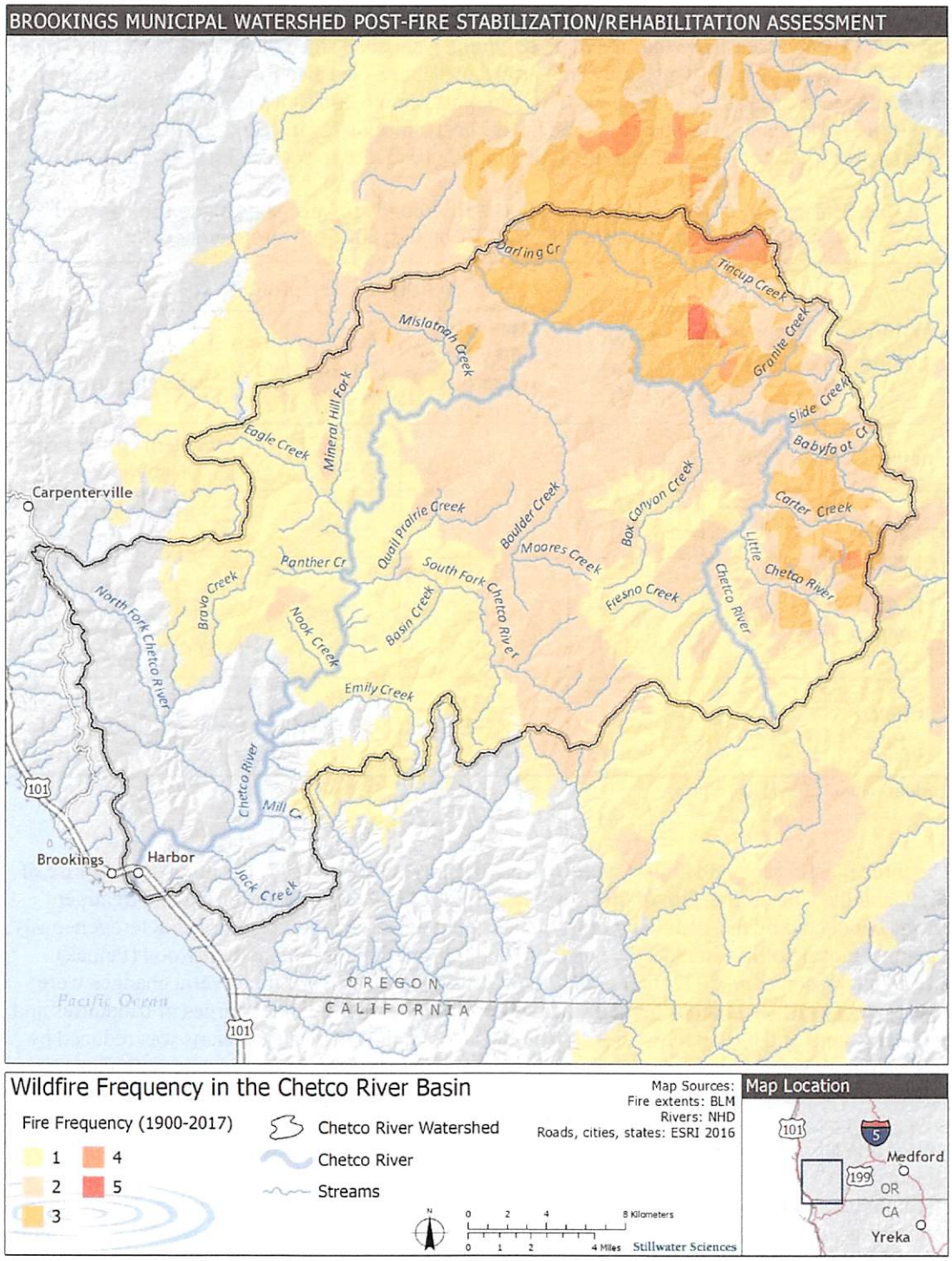

Figure 12. Frequency of recorded burn events in the Chetco River watershed (source data from BLM 2017; analysis by Stillwater Sciences).

To further investigate the potential impact of the Silver and Biscuit Complex fires on the runoff response in the Chetco River, two runoff-response metrics were computed using the available precipitation and riverflow records during water-years 1970–2017 following methods adapted from Saxe *et al.* (2018). An increase of either metric within the first few years after each of the two wildfire events signifies that runoff (*i.e.*, flashiness) increased due to the fires' impacts to the watershed. The "runoff ratio" plotted in Figure 13a represents the fraction of total runoff depth over total annual precipitation and, as depicted in the plot, reveals no systematic increase (or decrease) following either event. The Richards-Baker flashiness index (Baker et al. 2004; Figure 13b) measures the frequency and rapidity of inter-day changes in streamflow based on daily mean flow data. This metric also fails to reveal any systematic increase (or decrease) following either fire event. Thus, based on this investigation, neither wildfire event appears to have led to a measurable change in runoff or flashiness as observed at the USGS gage.

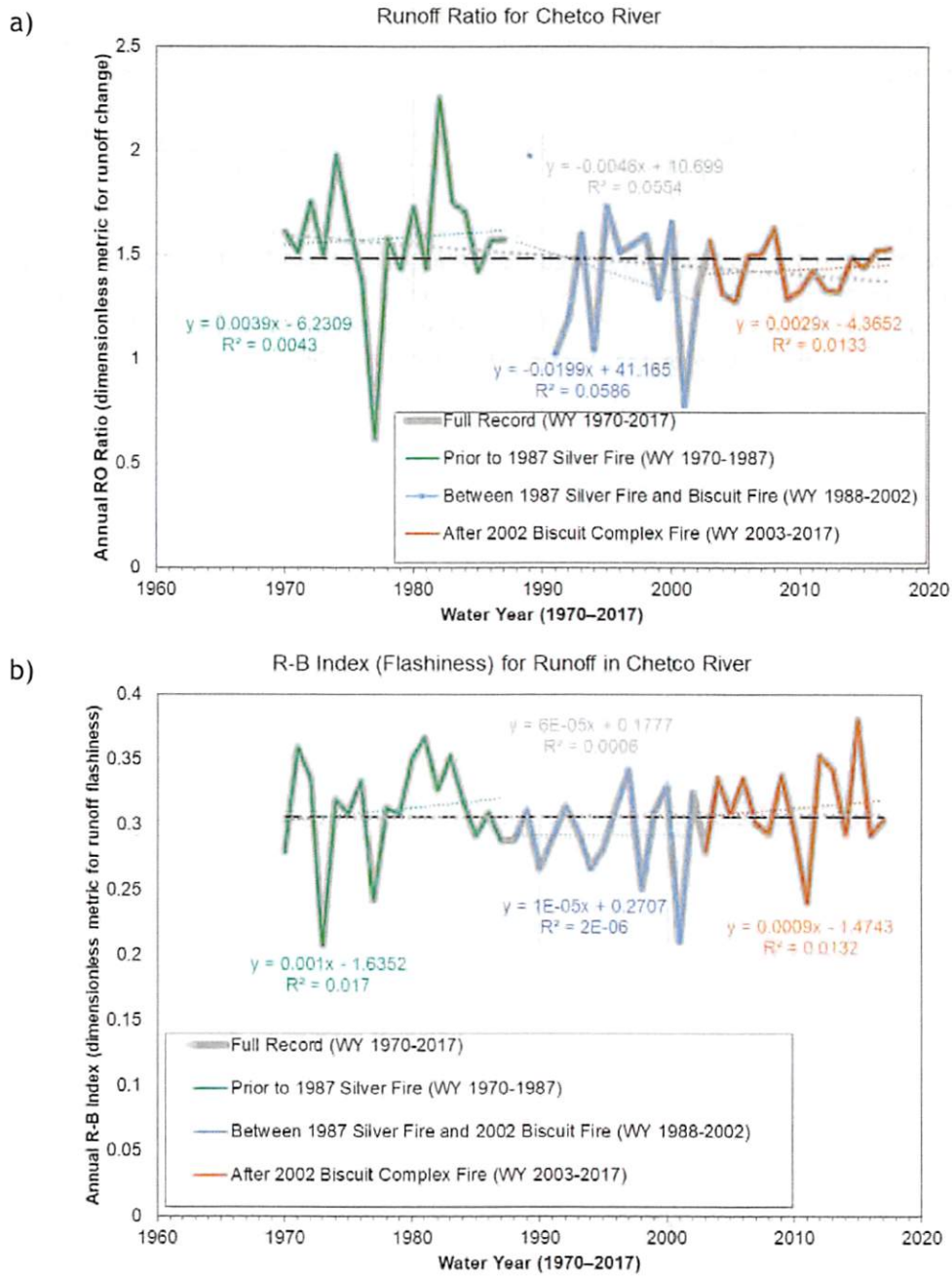

Figure 13. Estimated post-fire runoff-change metrics, runoff ratio (a) and R-B index (b), for the Silver and Biscuit Complex fires using daily precipitation recorded near Brookings and mean daily flow recorded at the USGS gage.

Potential Effects from Chetco Bar Fire

The Chetco Bar Fire resulted in a mosaic of burned and non-burned vegetative cover, and high to low soil-burn severity across the landscape (USFS 2017a,b). The USFS BAER Team produced a soil burn severity map based on rapid field assessment and aerial photo interpretation in order to identify and prioritize areas having potential for concentrated runoff, soil erosion, debris flow initiation and landslides, and impacts to critical ecosystem values (USFS 2017b; Figure 14). The BAER Team synthesized soil burn severity, hillslope gradient, effective ground cover, and reduced infiltration to estimate soil erosion hazard ratings, which were in turn used to estimate sediment-delivery rates in the burned subwatersheds of the Chetco River watershed (Table 6). The post-fire sediment-delivery rates for the 2-year and 5-year storm events, and for assumed conditions for untreated and treated (*e.g.*, seeded, mulched), were estimated to be a factor of 10–100 greater than pre-fire sediment-delivery rates from the burned areas.

Based on the BAER analysis, the implications for such high sediment yields to the drainage network and, particularly, to the mainstem Chetco River would be extreme. A large influx of fine and coarse sediment would overwhelm channel capacity and induce significant geomorphic change, overbank flooding, and water-quality impacts. Such impacts did not occur following the Silver and Biscuit Complex fires, however, and it can thus be inferred that the BAER sediment-delivery estimates for the Chetco Bar Fire are likely too high (USFS-BAER Team, pers. comm., 2018[1]). Thus, the primary value of these sediment-delivery estimates is likely in their predicted *relative* sediment-delivery potential from each of the watershed's major tributaries. The tributaries expected to have the highest potential are the South Fork Chetco River and Eagle Creek, and those with the lowest potential are Box Canyon, Little Chetco, and North Fork Chetco River (Table 6). Fish biologists with the Oregon Department of Fish and Wildlife (ODFW) have recently observed localized, ash-laden siltation in pools along lower Panther Creek, which is located near Eagle Creek and similarly drains high soil burn severity lands (ODFW, pers. comm., 2018[2]).

Table 6. USFS BAER-estimated sediment delivery for the Chetco River watershed within the Chetco Bar Fire for the 2-yr and 5-yr storm events (source data from Table 8 in USFS 2017b).

Subwatershed	Total 2-yr Untreated		Total 2-yr Treated		Total 5-yr Untreated		Total 5-yr Treated	
	(tons)	% of Total	(tons)	% of Total	(tons)	% of Total	(tons)	% of Total
Boulder Cr.	2,556,203	11%	1,077,010	10%	3,560,123	10%	1,685,714	9%
Box Canyon	807,887	4%	341,108	3%	1,132,323	3%	505,911	3%
Eagle Cr.	5,466,156	24%	2,643,327	24%	8,372,749	23%	4,408,130	25%
Granite Cr.	2,279,788	10%	885,279	8%	3,147,772	8%	1,278,853	7%
Little Chetco	680,581	3%	257,694	2%	1,008,752	3%	413,600	2%
Nook Cr.	2,444,837	11%	1,171,672	11%	3,939,923	11%	2,059,935	12%
N.F. Chetco R.	443,509	2%	246,118	2%	800,535	2%	438,487	2%
Sluice Cr.	2,692,702	12%	1,199,906	11%	3,909,060	11%	1,881,550	11%
S.F. Chetco R.	5,056,866	23%	2,337,396	21%	7,653,951	21%	3,869,145	22%
Tincup Cr.	2,456,007	11%	1,087,305	10%	3,479,173	9%	1,657,137	9%
Total	***22,439,700***		***11,000,699***		***37,044,360***		***17,760,035***	

[1] J. Brazier, Forest Soil Scientist, USFS Rogue River-Siskiyou National Forest
[2] T. Slaven, Experimental Biological Aide, ODFW Gold Beach Field Office

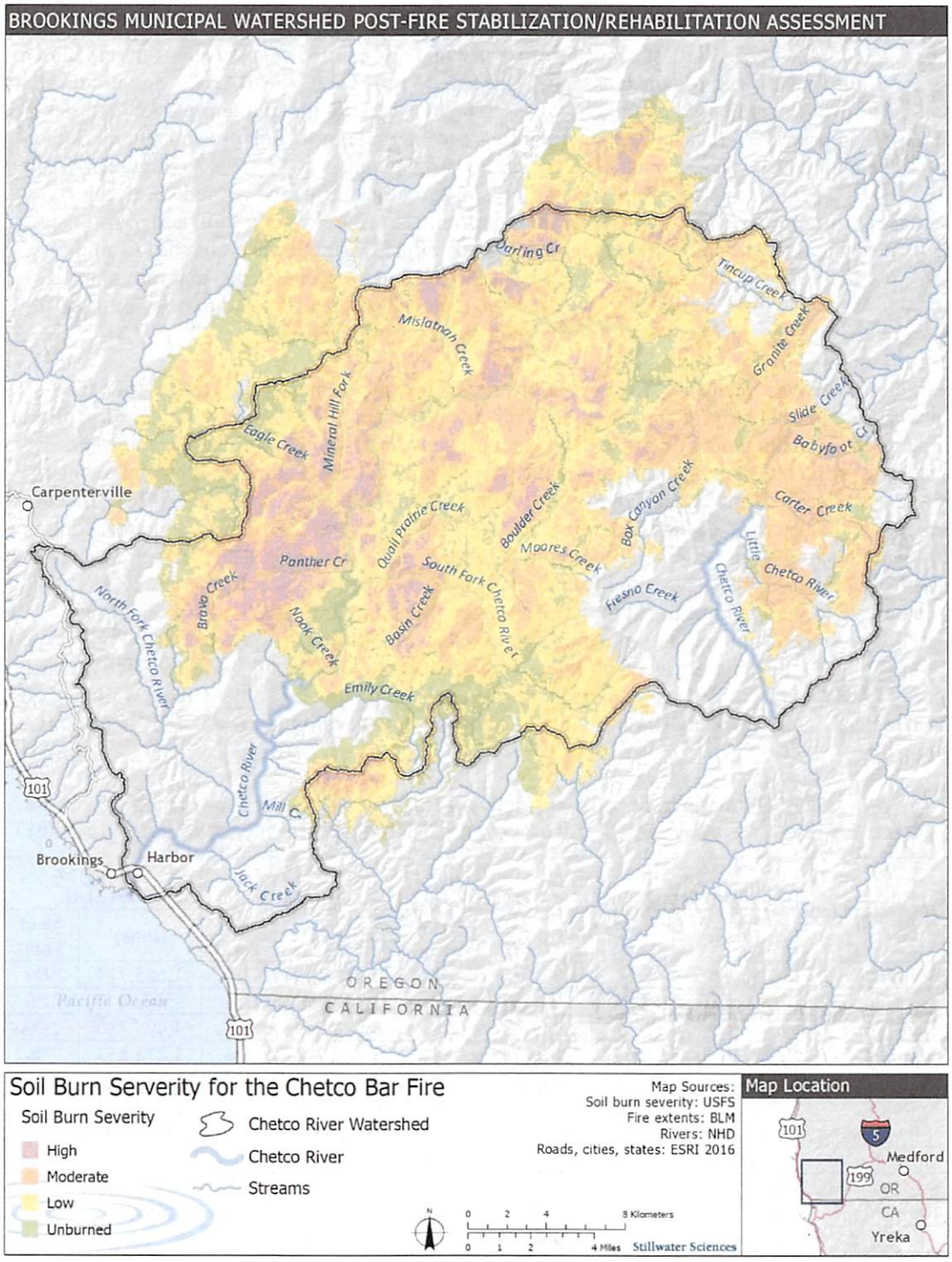

Figure 14. Estimated soil-burn severities from the Chetco Bar Fire (2017) (source data from USFS 2017b; cartography by Stillwater Sciences).

2.2 Field Reconnaissance

Stillwater Sciences staff conducted a brief field reconnaissance of the burned and unburned areas of the watershed on January 30, 2018. The field assessment relied on visual observations made via driving and hiking along or near to the North Bank Chetco River Road and branching Forest Service roads. The objectives of the reconnaissance were to: (1) field-validate conditions gleaned from the literature, such as the USFS BAER Team reports; (2) make new observations of post-fire erosion and sedimentation near the City's Ranney Collector and farther upstream along the mainstem Chetco River, North Fork and South Fork Chetco rivers, and other nearby tributaries and hillslope areas; and (3) establish photo-monitoring points that may be re-visited by the City to qualify changes over time in the scour or deposition of the channel.

Daily mean river flows during the reconnaissance were receding (4,960 cfs) following the water year's largest mean flow of 12,600 cfs on January 24th. This accompanied an instantaneous peak of 17,100 cfs (~1.1-year flood return period), which is the highest flow since the Chetco Bar Fire based on gage recordings made through March 14, 2018. Active timber-salvage logging in the burned areas was ongoing in the vicinity of the South Fork Chetco River confluence. Clear-water runoff in small seasonal streams was observed throughout the assessment area; the only turbid (muddy) waters were observed near the timber-salvage logging activities. Discrete post-fire deposits of fine sediment and burned organic debris were observed upon the larger gravel bars, and assumed to have deposited during the recent high flows. No obvious turbid waters or channel-bed or bank-scour were observed anywhere along the mainstem river corridor between the North Fork river confluence and Eagle Creek confluence (*i.e.*, RMs 5–20).

The following describes conditions observed at discrete locations in the watershed. Because the Ranney Collector is within a depositional reach of the river, field reconnaissance was focused on large depositional gravel bars where evidence of post-fire debris accumulation may most likely be observed. Photo monitoring points established during the field reconnaissance are described in Appendix A.

NF Chetco River Gravel Bar

This portion of the river lies about 7 mi. (~11 km) downstream of the burned perimeter of the Chetco Bar Fire. The large gravel bar formed at the mouth of the North Fork Chetco River ("North Fork Bar") lies at a point along the Chetco River where Wallick *et al.* (2010) characterized as being one of the most coarse-grained and geomorphically active reaches in the lower river valley (see Section 2.1.3–Geology and Geomorphology). The City's Ranney Collector is situated nearby upon a higher alluvial floodplain between the gravel bar and the North Bank Chetco River Road (Figure 15). The collector building is about 90-ft (28-m) from the edge of the geomorphically active gravel-bar surface that is demarked by a 3–6-ft (~1–2-m) high riverbank composed of alternating layers of sand-dominated and gravel-dominated flood deposits. The top of the riverbank appeared to be about 10 ft (~3 m) above the water surface of the Chetco River. The gravel bar has minimal shrub or grass cover indicating that it is flooded frequently enough and with sufficient force to preclude vegetation establishment. A higher-flow channel, or swale, runs along the back edge of the entire gravel bar, which likely conveys higher velocity flows. A long, linear and fresh deposit of silty sands and burned organic debris was observed along the gravel bar that is assumed to have deposited during the peak river flows of January 24th (Figure 16). The gravel bar and surrounding channel features exhibited no other evidence of fire-related deposition or scour.

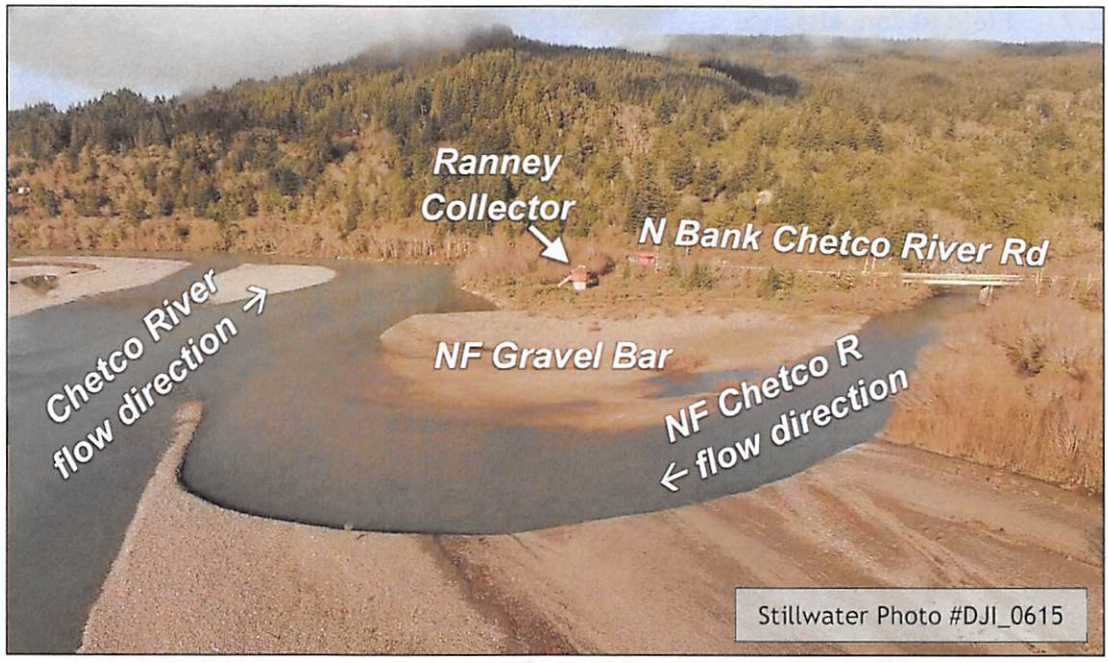

Figure 15. Oblique aerial view of the North Fork Chetco River gravel bar near the Ranney Collector.

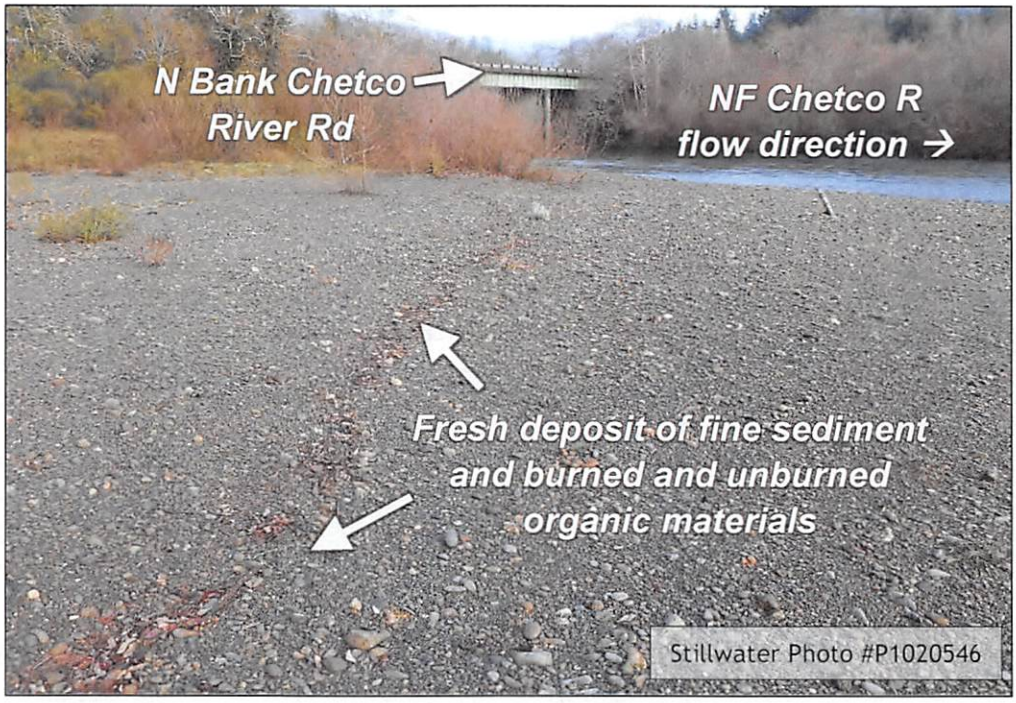

Figure 16. Photo of the North Fork Chetco River gravel bar near the Ranney Collector, looking north at a fresh linear deposit of fine sediment and burned/unburned organics.

Loeb State Park Gravel Bar

This portion of the river lies about 3.5 mi. (~5.5 km) downstream of the burned perimeter of the Chetco Bar Fire. The large gravel bar located on the western side of the Chetco River in Alfred A. Loeb State Park (~RM 15) is positioned on the inside of a fixed meander bend just downstream from and opposite to the Emily Creek confluence (Figure 17). Wallick *et al.* (2010) found the gravel-dominant bar (termed the "Loeb Park Bar") has experienced subtle lateral readjustments and nearby channel-bed aggradation over the past several decades. The opposing river bank on the river-left side exhibits exposed bedrock which acts as a control on the river's position in this reach. The gravel bar has minimal shrub or grass cover indicating that it is either: (1) flooded frequently enough and with sufficient force to preclude vegetation establishment; (2) disturbed by vehicular and foot traffic from recreation activities, such as boating and fishing; or (3) both. Evidence of recent higher flows, presumed to be the January 24th high-flow event, included laid-down grasses, large woody debris (some burned) (Figure 18), and fine sediment deposition at both ends of the bar, as well as a long, linear deposit of silty sands and a mix of burned and unburned organics composed mostly of leaves that ran along most of the bar's length (see Figure 17). The bar and other channel features visible in this reach exhibited no other evidence of deposition or scour that could be potentially attributed to the Chetco Bar Fire. Further, despite that the headwaters of Emily Creek were within the burn area, deposits at the creek's mouth appeared coarse and lacking evidence of recent movement or deposition of fines (Figure 19).

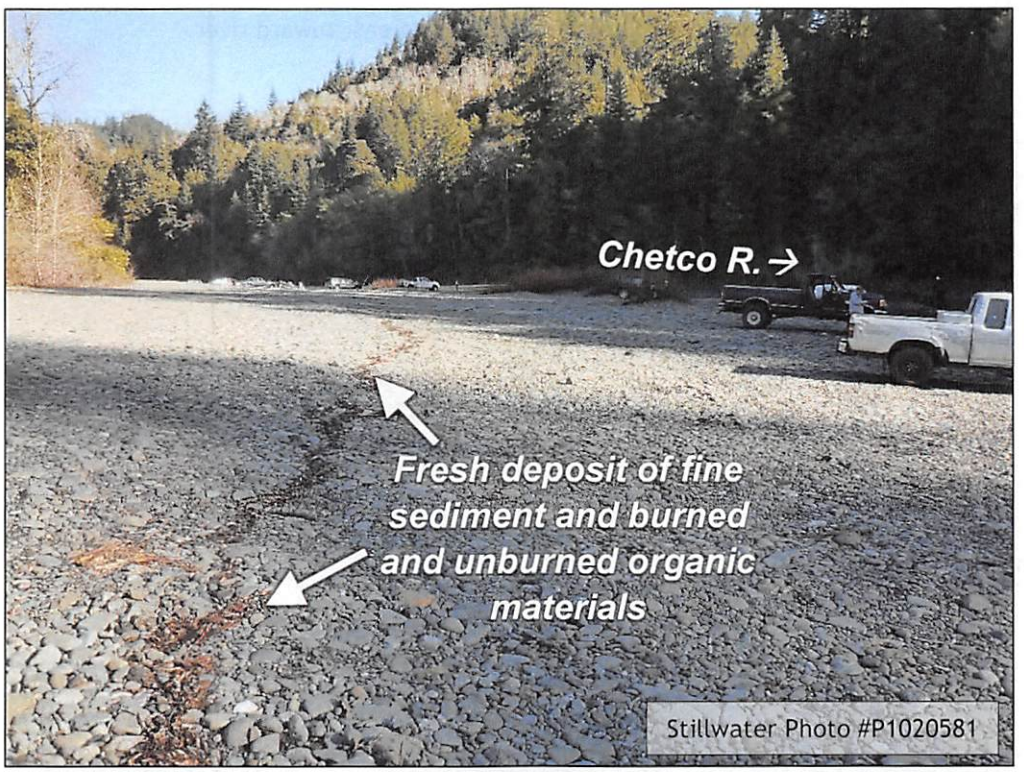

Figure 17. Photo of the Loeb State Park gravel bar along the Chetco River, looking north (upstream) at a fresh linear deposit of fine sediment and burned/unburned organics.

Figure 18. Photo of recently captured large woody debris with burn marks on the Loeb State Park gravel bar along the Chetco River, looking east toward river.

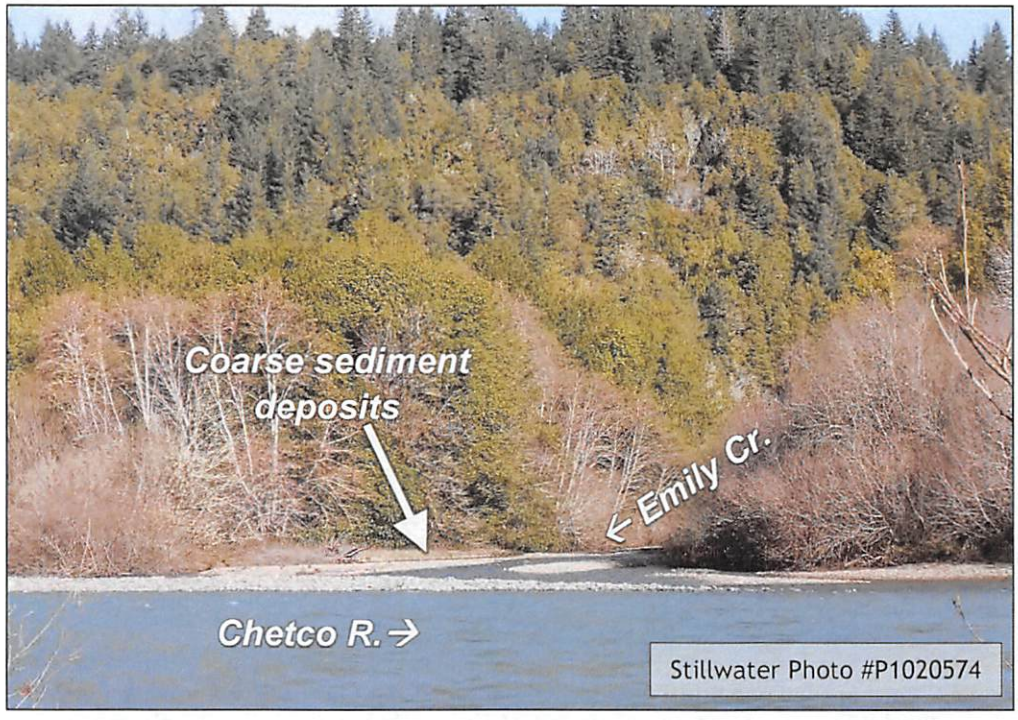

Figure 19. Photo of the mouth of Emily Creek entering the Chetco River, taken from the upstream end of the Loeb State Park gravel bar.

North Bank Chetco River Road at the USGS Gage

The North Bank Chetco River Road crosses over to the south (river-left) side of the river via a high-span bridge, which lies about about 1.8 mi. (~2.9 km) downstream of the burned perimeter of the Chetco Bar Fire. The USGS gage is located on the right (west) bank of the river immediately upstream of the bridge. Wallick *et al.* (2010) describe this as the upper end of the river's alluvial valley that functions primarily as a transport reach and, accordingly, has experienced minimal lateral changes due to bedrock riverbanks and steep canyon walls, while vertical changes have fluctuated about 6 ft (~2 m) between 1971 and 2007. Two large gravel bars are fixed upstream and downstream of the bridge that reveal evidence of frequent higher-flow scour and recreation uses that precludes vegetation establishment. Fresh fine-sediment deposits were observed on the downstream side of the upstream gravel bar, some of which appeared to contain burned organics. The gravel bar and surrounding channel features exhibited no other evidence of fire-related deposition or scour.

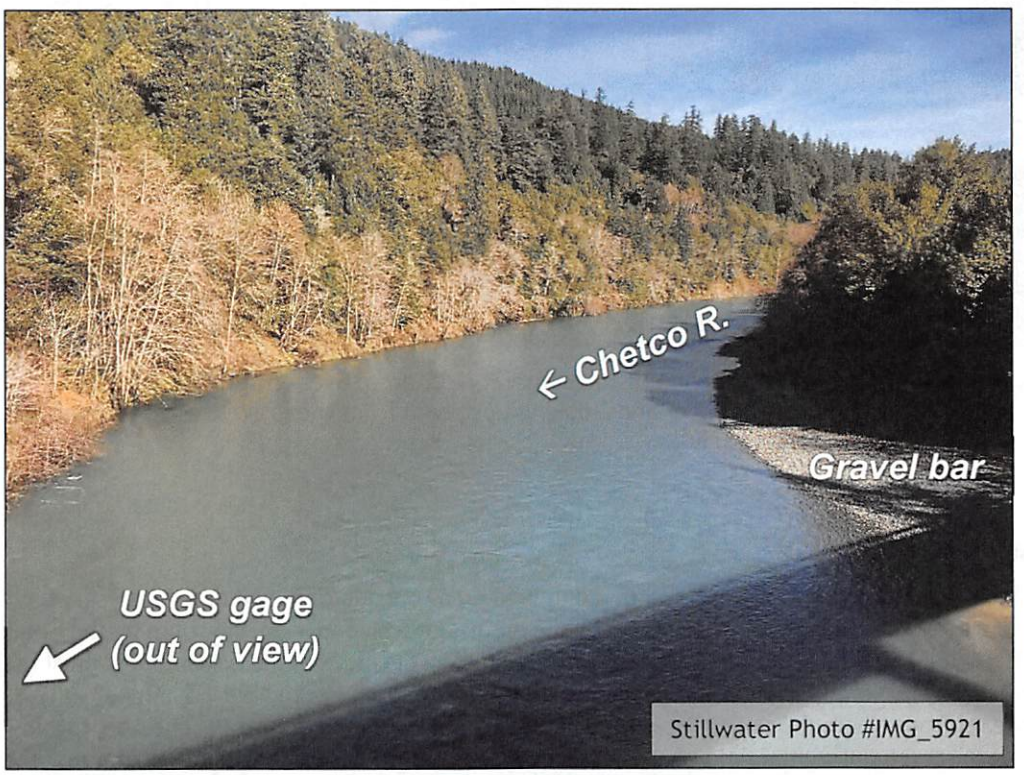

Figure 20. Photo of the Chetco River looking upstream from the North Bank Chetco River Road next to the USGS gage.

South Fork Chetco River Confluence

The South Fork Chetco River, all of which lies within the burn area, pours into the mainstem Chetco River on Forest Service lands within the perimeter of the Chetco Bar Fire. The South Fork joins the river in a broad allviual reach bordered on the east (river left) by steep, forested canyon wall and on the west (river right) by a higher, alluvial floodplain with vegetation (Figure 21). The river winds around large gravel bars and higher floodplain surfaces within the confines of steep

canyon walls with isolated bedrock outcrops. Evidence of burned trees on higher hillslopes was observed, whereas none of the riparian trees and shrubs near the river appeared to have been burned. The gravel bar at the confluence is composed of clean sands and gravels with minimal shrub or grass cover indicating that it is flooded and reworked frequently during higher flows. Water clarity, or turbidity, in the South Fork appeared slightly less clear than in the mainstem river. Active salvage logging operations were ongoing on the hillslopes near this location. The bar and other channel features visible in this reach exhibited no other evidence of deposition or scour that could be potentially attributed to the Chetco Bar Fire.

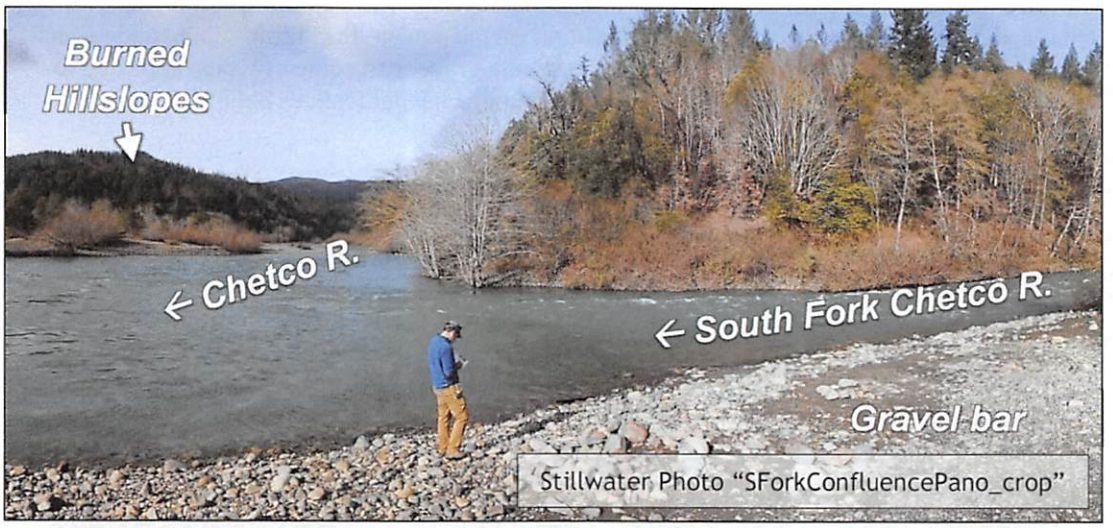

Figure 21. Photo of the confluence of the South Fork Chetco River with the mainstem Chetco River on Forest Service lands looking upstream from the gravel bar formed at the mouth of the South Fork.

Quail Prairie Creek

Active salvage logging was observed in the upland areas outside of the National Forest, which was bordered approximately on the west by the mainstem Chetco River, the south by the South Fork Chetco River, and the east by Quail Prairie Creek. This creek is the downstream-most major tributary to the South Fork Chetco River, which joins the South Fork about 1.2 mi. (~2 km) upstream from where the South Fork joins the mainstem river (see Figure 1). The only turbid runoff observed during the field reconnaissance was in small, unnamed tributaries draining the lands being actively salvage-logged, one of which was observed from Red Mountain Road to be delivering brownish colored water into Quail Prairie Creek (Figure 22). The turbidity plume was also observed to quickly dissapate once delivered to the clearer and more voluminous waters of Quail Prairie Creek (Figure 23). Apart from burned trees and ground surfaces, the channel features visible in the vicinity exhibited no other evidence of deposition or scour that could be potentially attributed to the Chetco Bar Fire.

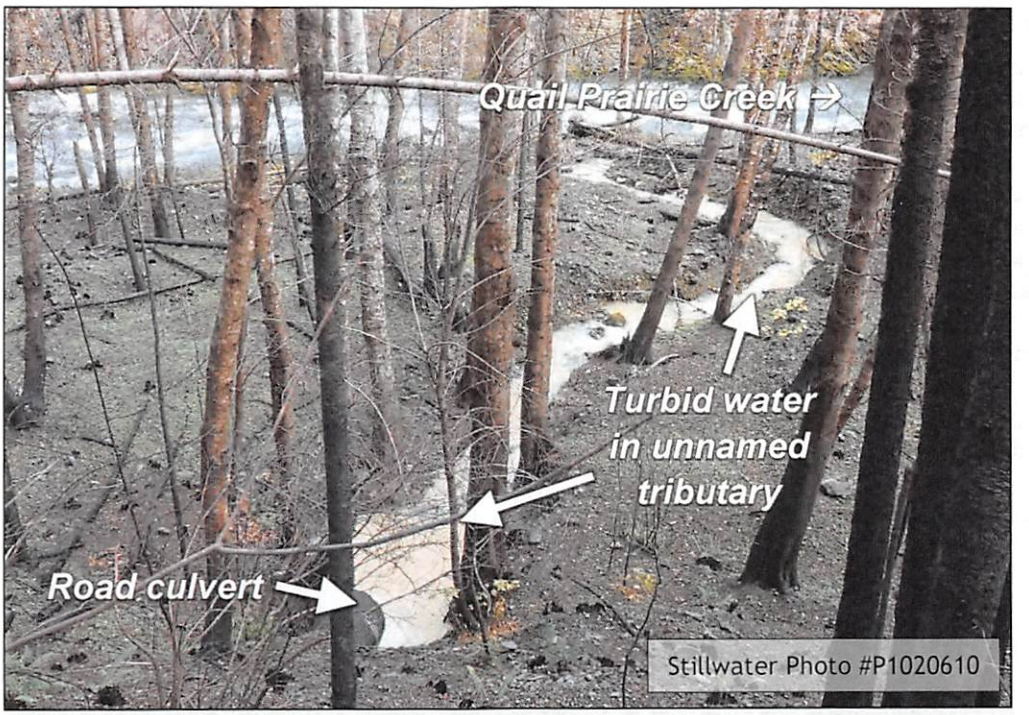

Figure 22. Photo from Red Mountain Rd in the National Forest looking at turbid water in an unnamed tributary flowing into Quail Prairie Creek.

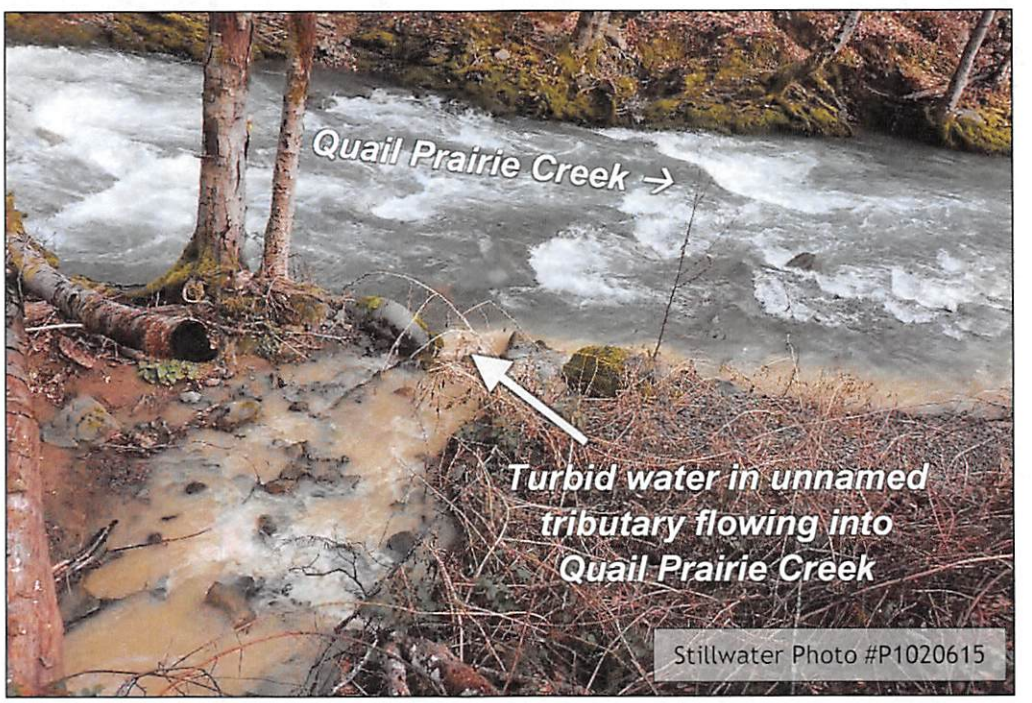

Figure 23. Photo of turbid water from the unnamed tributary flowing into Quail Prairie Creek.

Panther Creek Confluence

Information from ODFW personnel indicated that significant post-fire siltation of fish-spawning pools along Panther Creek had been observed earlier in the month (see Section 2.1.5—Wildfire above), which directed Stillwater Sciences to investigate the lower creek and confluence for post-fire changes. The Panther Creek subwatershed is entirely within the burned area—the drainage basin appeared burned throughout (Figure 24). The USFS BAER Team estimated much of the subwatershed and surrounding areas as having high-intensity burn severity (see Section 2.1.5–Wildfires above). Panther Creek empties into a tight, fixed meander bend of the Chetco River upstream of the South Fork where a large alluvial fan and gravel expanse with minimal vegetation cover is commonly present. An alluvial fan composed of a mix of silts, sands, and gravels with evidence of fresh fine sediment and burned organics indicated that these were post-fire deposits (Figure 25). Water clarity appeared slightly less clear in lower Panther Creek as it poured into the river. The gravel bar and surrounding channel features exhibited no other evidence of fire-related deposition or scour.

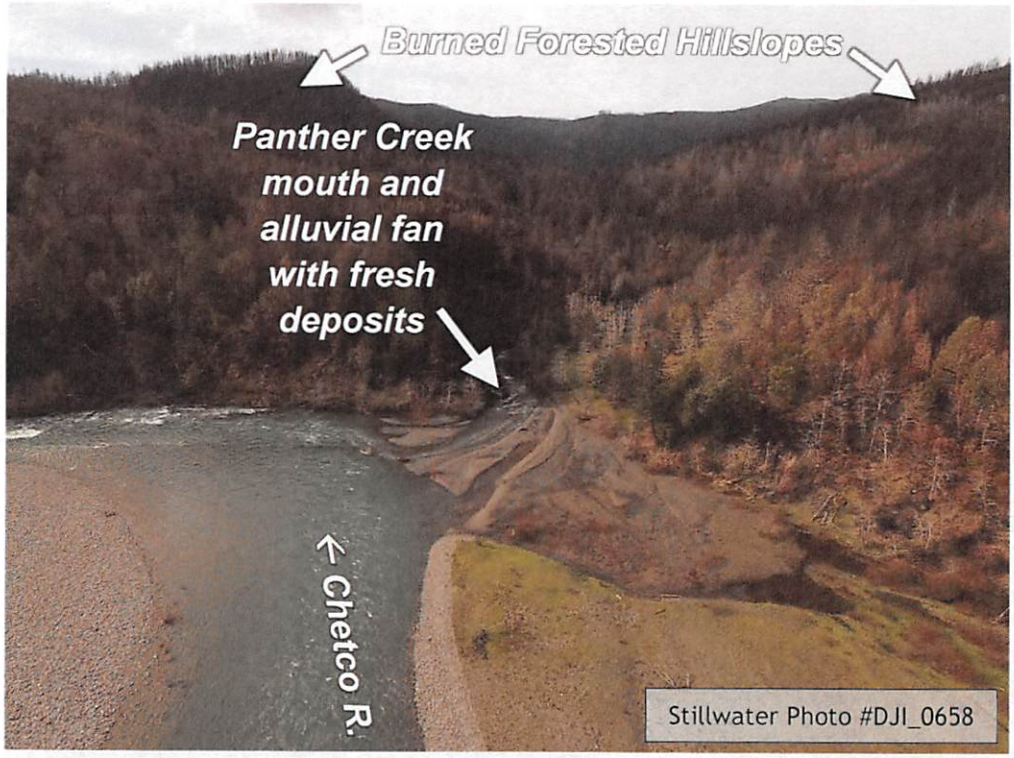

Figure 24. Oblique aerial view of the confluence of Panther Creek with the mainstem Chetco River within the burned area.

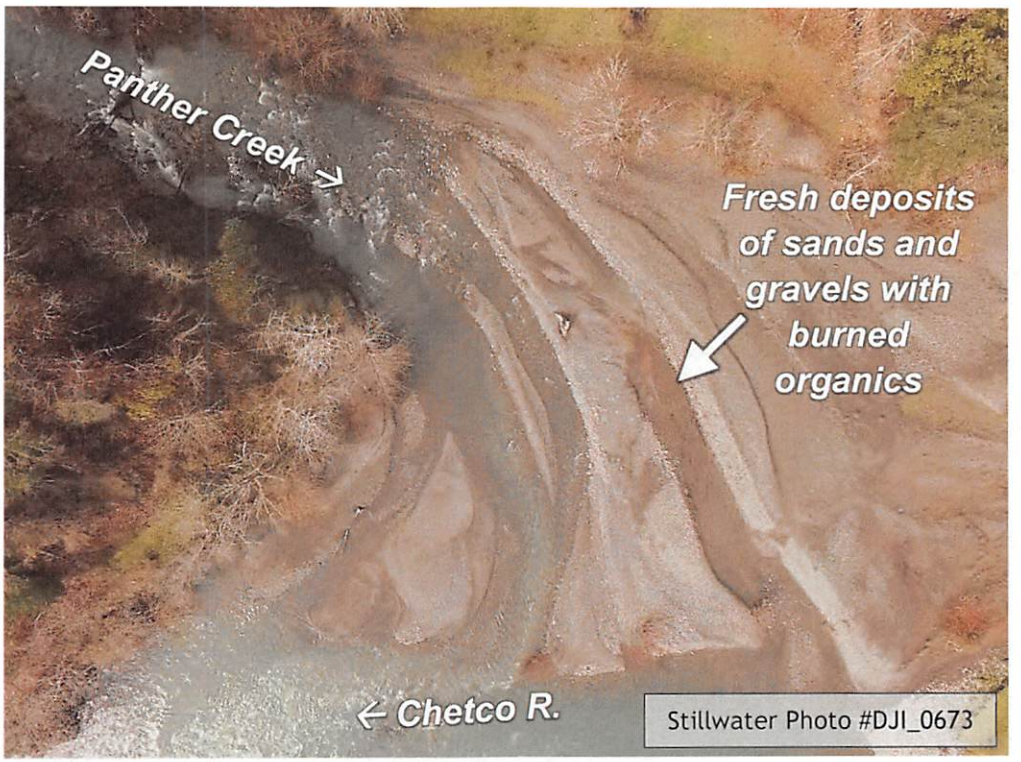

Figure 25. Nadir aerial view of the Panther Creek mouth looking at fresh alluvial deposits composed of fine sediments and burned organics.

High Prairie Road Bridge

The most upstream field observation was made from the High Prairie Road bridge that crosses the Chetco River about 1.7 mi. (~2.7 km) upstream of the Eagle Creek confluence, which are all within the burned area Chetco Bar Fire, but still downstream from the burned area of the older Silver and Biscuit Complex fires. The river width is well-constrained on both sides by steep canyon walls, from which several small, unnamed tributaries flow. Evidence of burned forested hillslopes outside of the riparian corridor was noted and clear-water flowed from several small tributaries that did not appear to have been impacted by the recent fire (Figure 26). Water clarity in the mainstem river appeared similar to that observed farther downstream near the Ranney Collector. The river channel and tributaries exhibited no other evidence of fire-related deposition or scour.

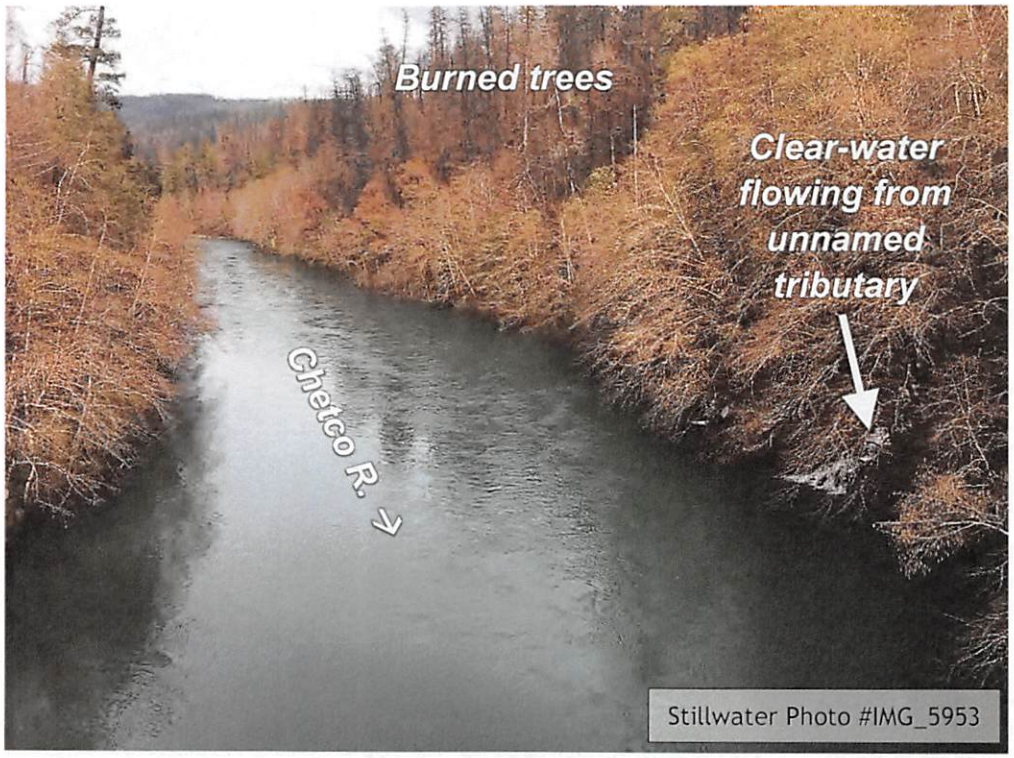

Figure 26. Photo of the Chetco River looking upstream from the High Prairie Road (NF 1376) bridge in the National Forest and upstream of the Eagle Creek confluence.

Burned Hillslopes

The field reconnaissance further observed burned upland areas well above the perennial stream network to identify sources of significant sediment input, which could include raveling, rilling, gullying, and landsliding features (Figure 27). The majority of burned areas appeared to retain much of their pre-fire overstory (*i.e.*, tree) biomass, ranging from minimally denuded tree cover to wholly denuded trees being little more than hollow stumps, but often the understory and soils were heavily scorched (Figure 28). Evidence of concentrated overland flow during the recent storms was not apparent and the many small, low-order tributary channels conveyed clear water with apparent low turbitidy absent of ash and fine-sediment concentrations. No rilling or gullying was observed during the reconnaissance, nor were there any accumulations of sediment at typical deposition or clogging points, such as road crossings and drainage culverts. One post-fire shallow landslide was observed in the South Fork Chetco River watershed on a steep hillslope, which was based on exposure of bare, unburned soils surrounded completely by burned soils and trees (Figure 29). Throughout much of the burned hillslopes visited during the reconnaissance, new post-fire vegetation growth was observed, particularly from grasses, shrubs, and tanoaks (Figure 30), which signifies the initial recovery of the landscape.

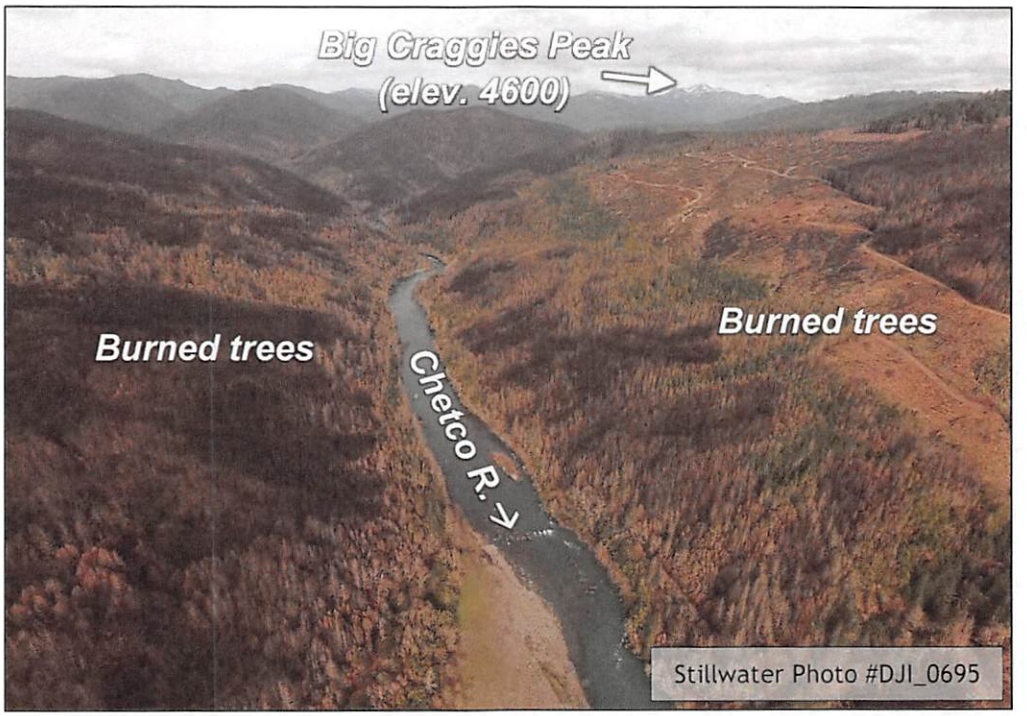

Figure 27. Oblique aerial photo of the Chetco River looking upstream from near the Panther Creek confluence at forest lands burned during the Chetco Bar Fire.

Figure 28. Photo of the burned conifers and denuded ground surface in the National Forest near the middle of the Chetco River watershed.

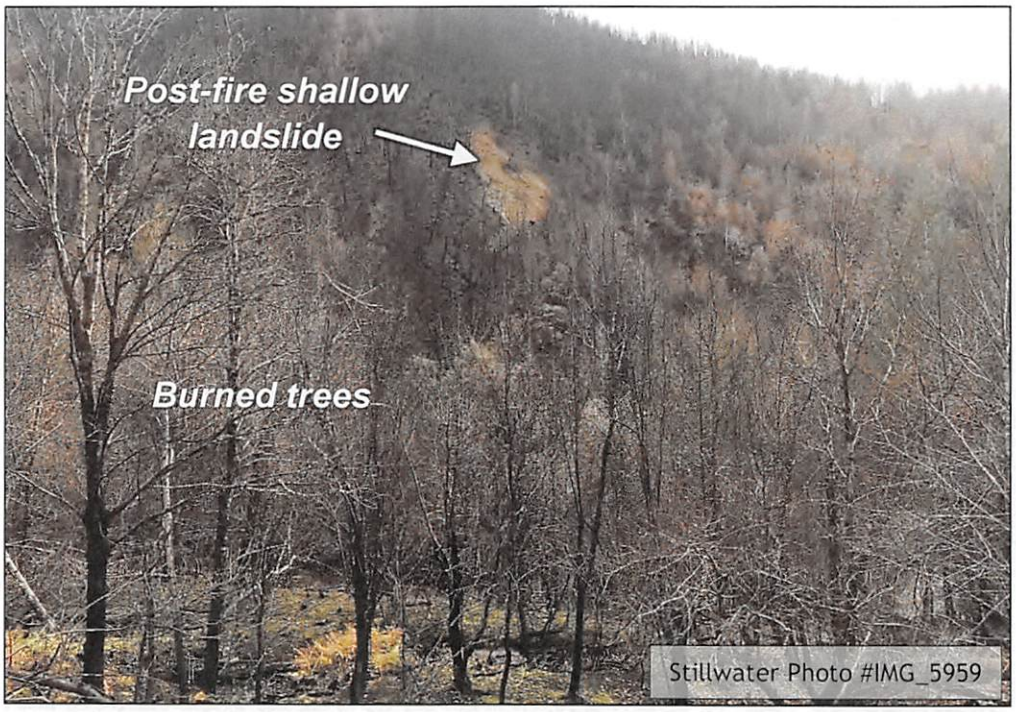

Figure 29. Photo of a post-fire shallow landslide in the South Fork Chetco River watershed.

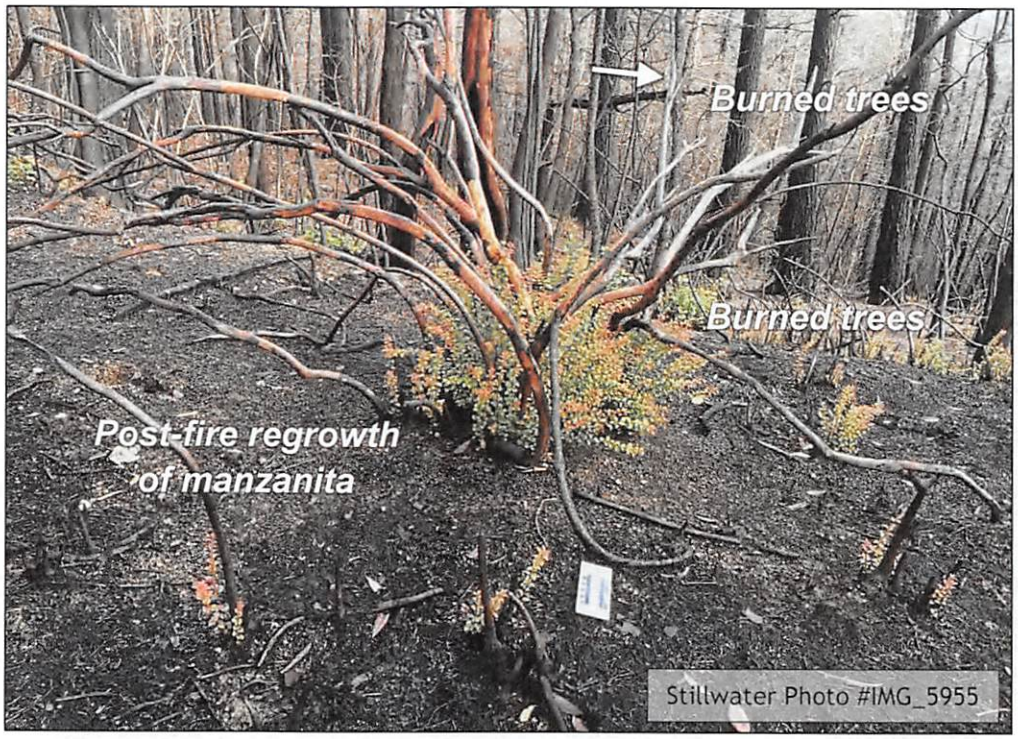

Figure 30. Photo of burned manzanita (*Arctostaphylos* spp.) within a burned stand of tanoak (*Lithocarpus densiflorus*) with prevalent post-fire regrowth.

3 CONCLUSIONS

3.1 Summary of Findings

The following briefly summarizes the findings of the assessment described in the preceding sections:

- Under natural conditions, the combination of the Chetco River watershed's rugged physiography, high drainage density, and high rainfall associated with a Pacific marine climate results in high annual runoff and flashy short-duration peak flows, but low summer flows. The climate helps support a dense forest cover throughout much of the watershed, which is limited by underlying geology and limited urban developments.
- The City of Brookings' Ranney Collector, near the North Fork confluence, lies along a reach of the Chetco River that is dominated by sediment deposition, where broad, coarse-grained gravel bars are periodically reworked laterally and vertically in response to annual high flows.
- The watershed has experienced three large wildfires in recent decades that have coincidently grown larger with each new event. Wildfires have the potential to exacerbate runoff concentration and flashiness, soil erosion, turbidity concentrations (and other water quality constituents), and deposition in downstream areas. Observations made by other researchers following the older Silver and Biscuit Complex fires noted little occurrence of these processes.
- Within the months since the Chetco Bar Fire, the few flushes of runoff through the watershed appear to have resulted only in very minor delivery of fine sediment and burned organics from some of the most heavily burned tributaries, such as Panther Creek, and limited, transient sediment-accumulation along larger gravel bars in depositional zones of the Chetco River, such as the Loeb State Park and North Fork gravel bars. Clear-water was observed in nearly all inspected small and large tributary streams following the water-year's largest storm and runoff event. The only noted occurrence of turbid-water runoff was from small streams draining burned areas with active salvage-logging.
- The collector well extends down to about 10–20 feet lower than the riverbed and is set back at least 100 feet laterally from the active river and gravel bar. The lateral intake screens are relatively short (~70 ft), and do not extend under the river's gravel bar. With this configuration, water should have good travel time and filtration as it migrates to the well's intake screens, and water quality should not noticeably change because of increased turbidity in the mainstem river flow. If the well were directly in the river, like the well for the nearby community of Harbor, the saturated riverbed during times of increased turbidity may cause filtration effectiveness to decline. If the river stage increases or the active channel migrates closer to the collector, the effective setback of the collector well decreases and the risk for possible water quality impacts at the collector increases.
- Overall, the potential for post-fire hydro-geomorphic impacts to the Ranney Collector through scour of the adjacent gravel bar and floodplain or deposition of fine sediments upon either surface appears low, based on the minimal post-fire changes observed to date. The stream power of the lower river appears sufficient under normal circumstances to flush-out any debris-laden flows to the ocean and limit excess sedimentation of fine particles in the lower river. The potential for post-fire effects to runoff, sediment-

transport, and water quality may remain for several years, however, until the vegetation cover has reestablished and stable soil layers have reformed in the burned areas.

3.2 Recommendations

The following actions are recommended to further assess post-fire changes in runoff and sediment-transport dynamics that could potentially lead to adverse impacts to the Ranney Collector and water-supply quality:

- The photo monitoring points established in this assessment should be revisited by City personnel or their contractors to visually detect post-fire changes in river scour and/or deposition (see Appendix A). Photo monitoring may be best implemented during and/or soon following storm events.
- Watershed runoff should be monitored through routine review of river discharge recorded at at the USGS gage, which will enable the City to watch for large events that may potentially lead to geomorphic changes in the lower river. Further, while the assessment presented herein did not detect changes in runoff flashiness during the years following the watershed's two previous wildfire events, use of these or other runoff metrics could be employed again using USGS gage data in the coming years to assess changes following the Chetco Bar Fire.
- Water quality sampling, particularly monitoring of turbidity, should continue as part of the project's Wildfire Source Water Protection Sampling and Analysis Plan (GSI 2018).
- If photo monitoring and/or water quantity/quality monitoring detect changes in their targeted metrics, more intensive monitoring is recommended in the form of field-data collection and analytical modeling to better assess and forecast near- and long-term conditions. For example, hydraulic and channel-change modeling could utilize the HEC-RAS model and sediment-transport models developed by the USGS in their study (Wallick *et al.* 2010).
- Future monitoring efforts should be coordinated with other entities, including the USFS BAER Team, ODFW, and the Oregon Department of Environmental Quality (ODEQ). The USFS continues to implement post-fire land management actions called out in their BAER reports (*e.g.*, USFS 2017a). The ODFW continue to conduct biological monitoring throughout the watershed which may contain direct or indirect observations on aquatic habitat conditions, including channel-bed scour and sedimentation. And, ODEQ has recently begun initial scoping and water-quality data collection efforts for a Total Maximum Daily Load (TMDL) plan for the Chetco River watershed, which was recently listed by Environmental Protection Agency as being impaired by summer water temperatures (RMs 39.4–57.1) considered to limit beneficial uses of anadromous fish passage and salmonid fish rearing. The ODEQ plans to work with representatives from Curry County and the City of Brooking over the next decade to collect and analyze data (*e.g.*, temperature, dissolved oxygen, pH, nutrients, bacteria, and fine sediment), and finalize and implement the TMDL plan (ODEQ, pers. comm., 2018[3]).

[3] B. Duggan, South Coast Basin Coordinator, ODEQ, Western Region, Coos Bay; additional details of the Chetco River TMDL plans are available online at: http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-South-Coast-Basin.aspx.

4 GEOLOGIST CERTIFICATION

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Oregon Registered Geologist, No. G2401

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Appendix A

Photo Monitoring Points

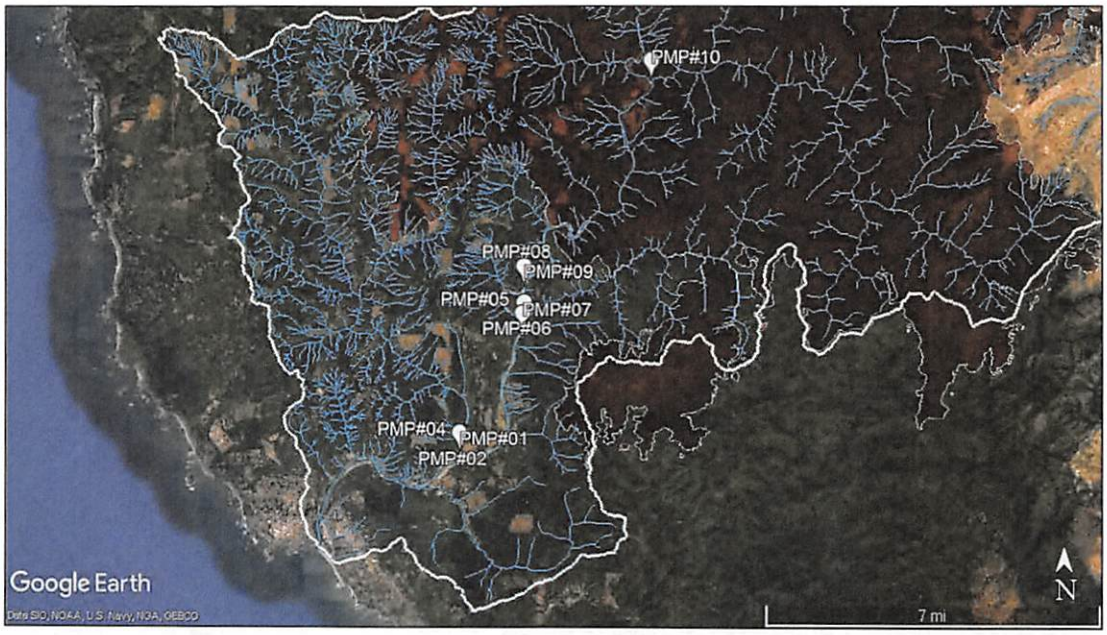


Figure A-1. Overview of photo monitoring points established along the Chetco River (imagery source Google Earth).

Figure A-2. Overview of photo monitoring points established of the N.F. Chetco River gravel bar adjacent to the City's Ranney Collector at the confluence of the N.F. Chetco and mainstem Chetco rivers (imagery source Google Earth, dated July 2, 2016).

Photo-Monitoring Point #1—Near Ranney Collector on NF Chetco gravel bar (42.074027°N, -124.212881°W), standing near large, stationary log at edge of floodplain along river-access trail from Ranney Collector and looking NNE towards NF Chetco River flowing toward the right—*observe changes in wetted-channel position relative to gravel bar, vegetation cover, and scour or deposition on the bar*

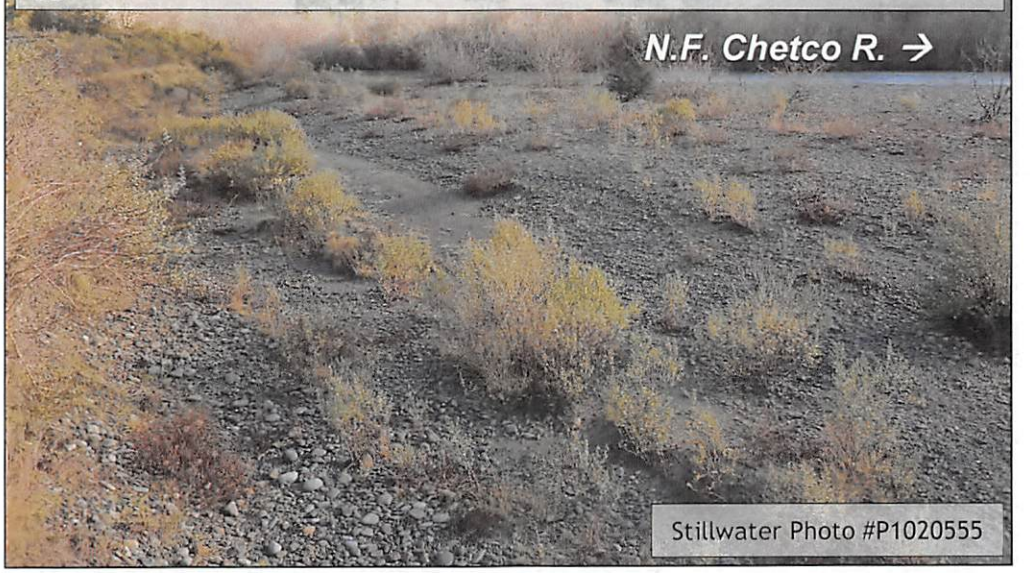


Photo-Monitoring Point #2—Near Ranney Collector on NF Chetco gravel bar (42.074060°N, -124.212715°W), standing near middle of gravel bar and looking downstream along higher-flow channel towards Chetco River (flowing to right); stationary log referenced in PMP#1 visible near photo center—*observe changes in wetted-channel positions relative to gravel bar, vegetation cover, and scour or deposition on the bar and within higher-flow channel along back edge of bar*

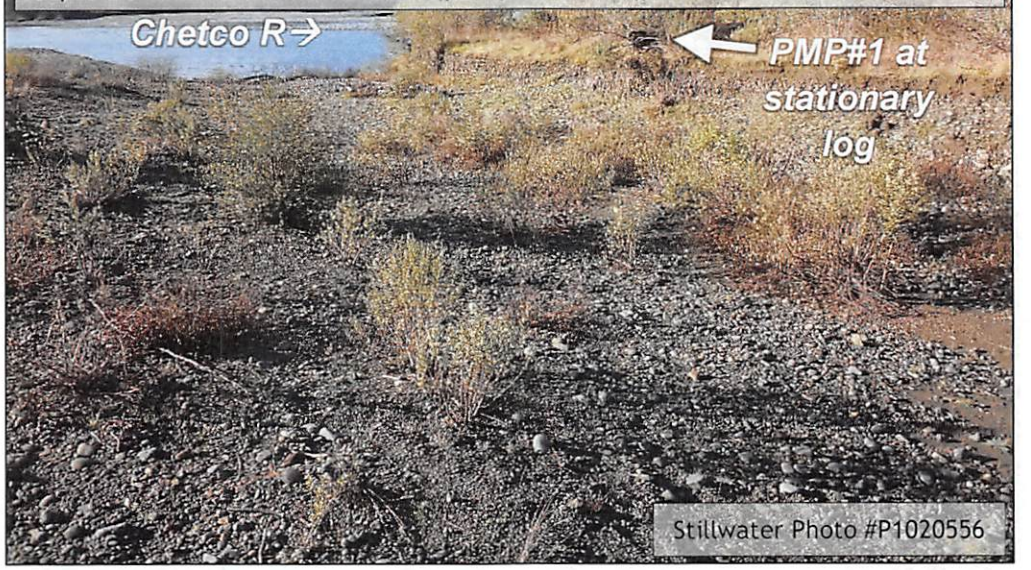
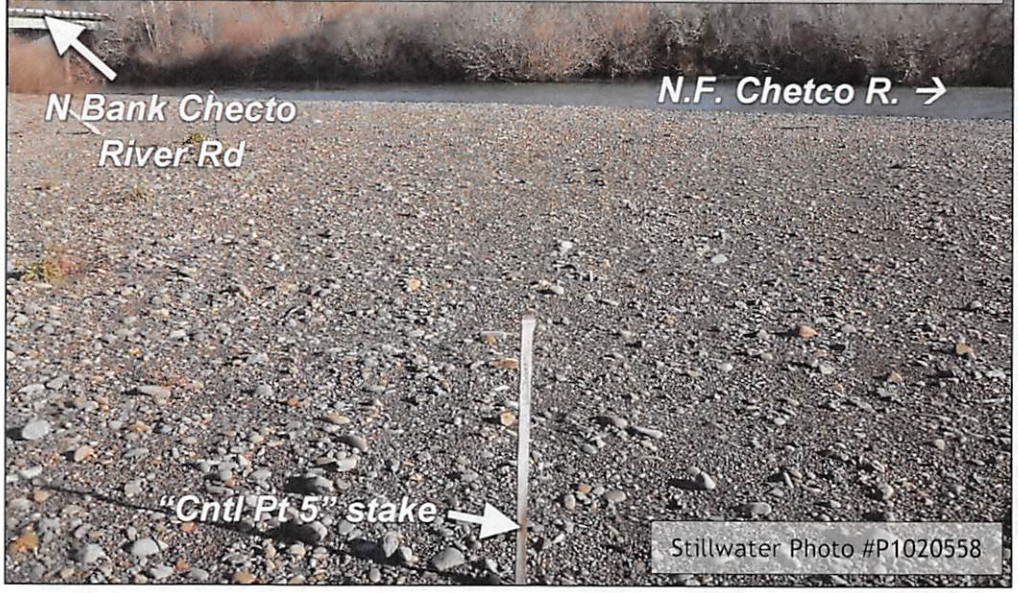


Photo-Monitoring Point #3—Near Ranney Collector on NF Chetco gravel bar (42.074523°N, -124.212339°W), standing near northern portion of gravel bar and looking NE towards NF Chetco River flowing toward the right— *observe changes in wetted-channel position relative to gravel bar, vegetation cover, and scour or deposition on the bar*

Photo-Monitoring Point #4—Near Ranney Collector on NF Chetco gravel bar (42.074106°N, -124.212138°W), standing near center of gravel bar and looking N towards NF Chetco River flowing toward the right—*observe changes in wetted-channel position relative to gravel bar, vegetation cover, and scour or deposition on the bar and within higher-flow channel along back edge of bar.*



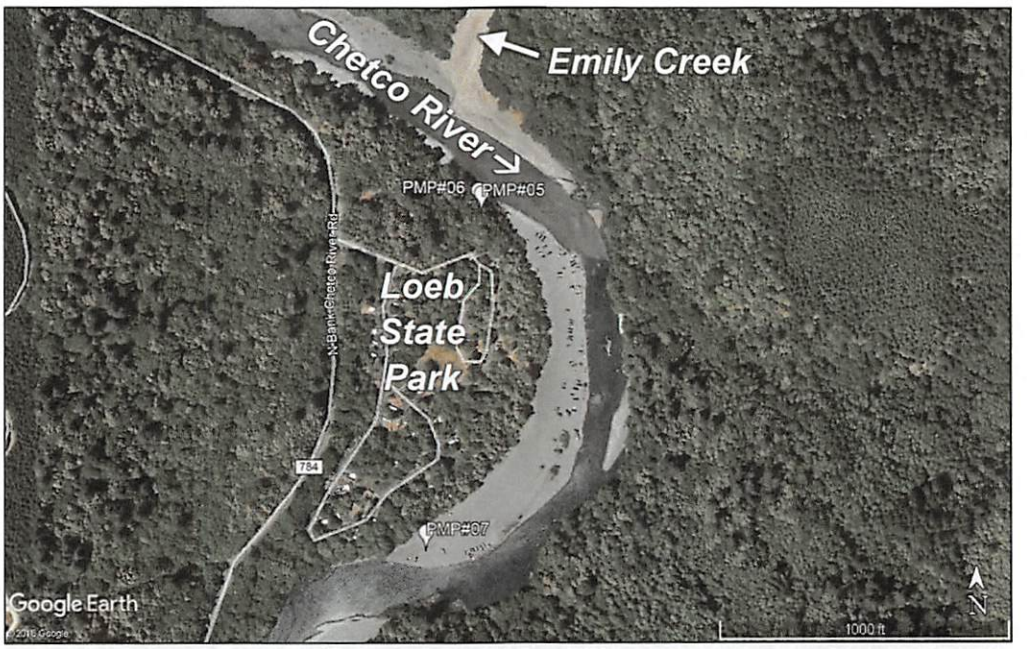
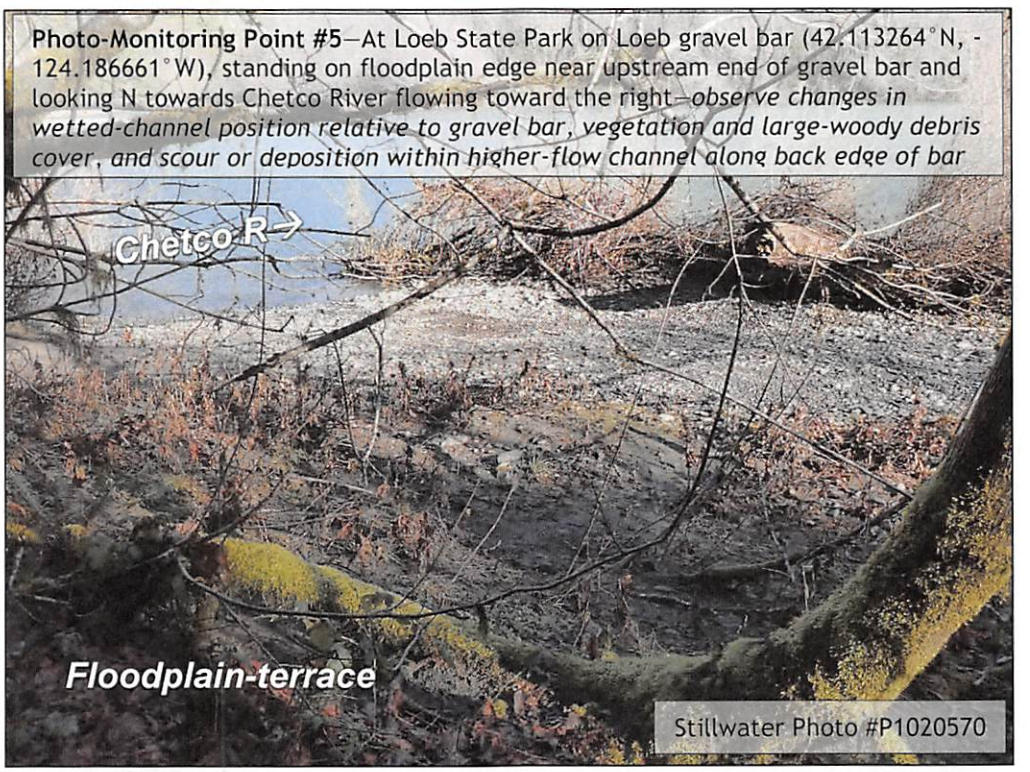


Figure A-3. Overview of photo monitoring points established of the Loeb State Park gravel bar along the Chetco River downstream of Emily Creek (imagery source Google Earth, dated July 2, 2016).



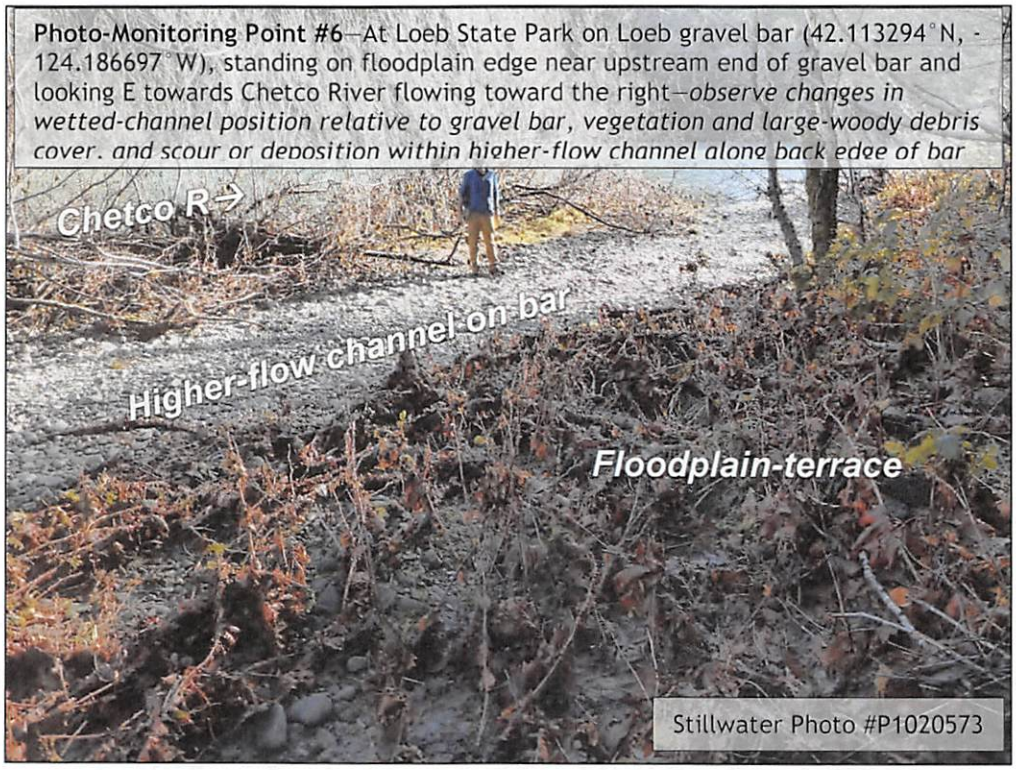


Photo-Monitoring Point #6—At Loeb State Park on Loeb gravel bar (42.113294° N, -124.186697° W), standing on floodplain edge near upstream end of gravel bar and looking E towards Chetco River flowing toward the right—observe changes in wetted-channel position relative to gravel bar, vegetation and large-woody debris cover, and scour or deposition within higher-flow channel along back edge of bar
Chetco R→
Higher-flow channel on bar
Floodplain-terrace
Stillwater Photo #P1020573

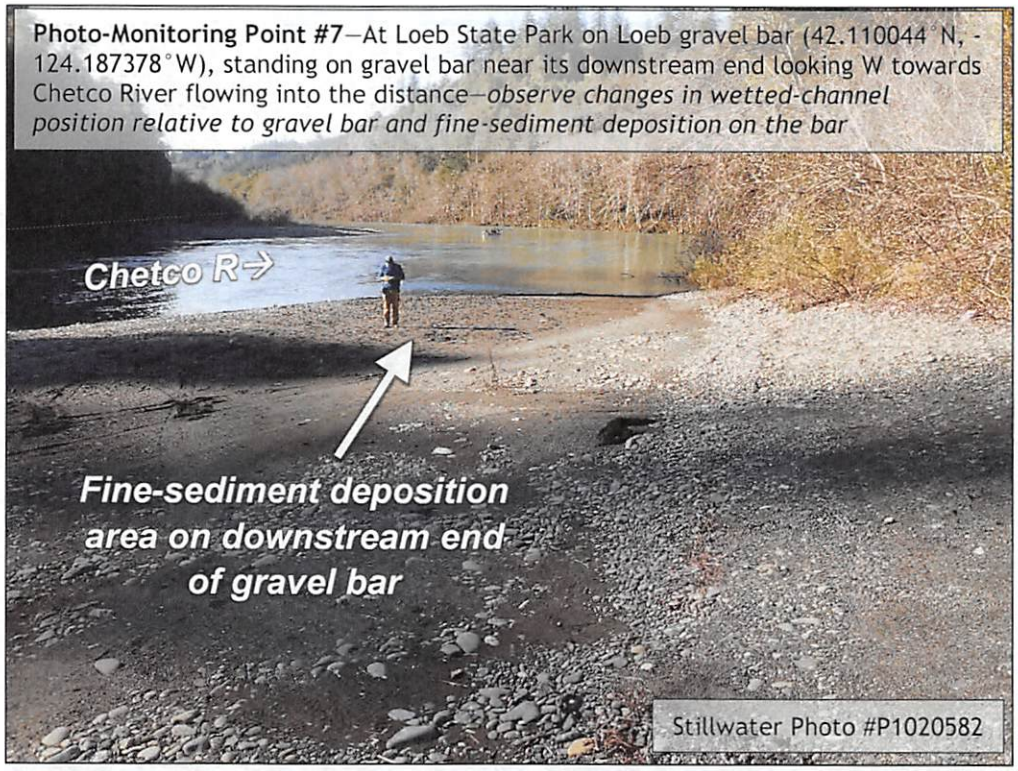


Photo-Monitoring Point #7—At Loeb State Park on Loeb gravel bar (42.110044° N, -124.187378° W), standing on gravel bar near its downstream end looking W towards Chetco River flowing into the distance—observe changes in wetted-channel position relative to gravel bar and fine-sediment deposition on the bar
Chetco R→
Fine-sediment deposition area on downstream end of gravel bar
Stillwater Photo #P1020582

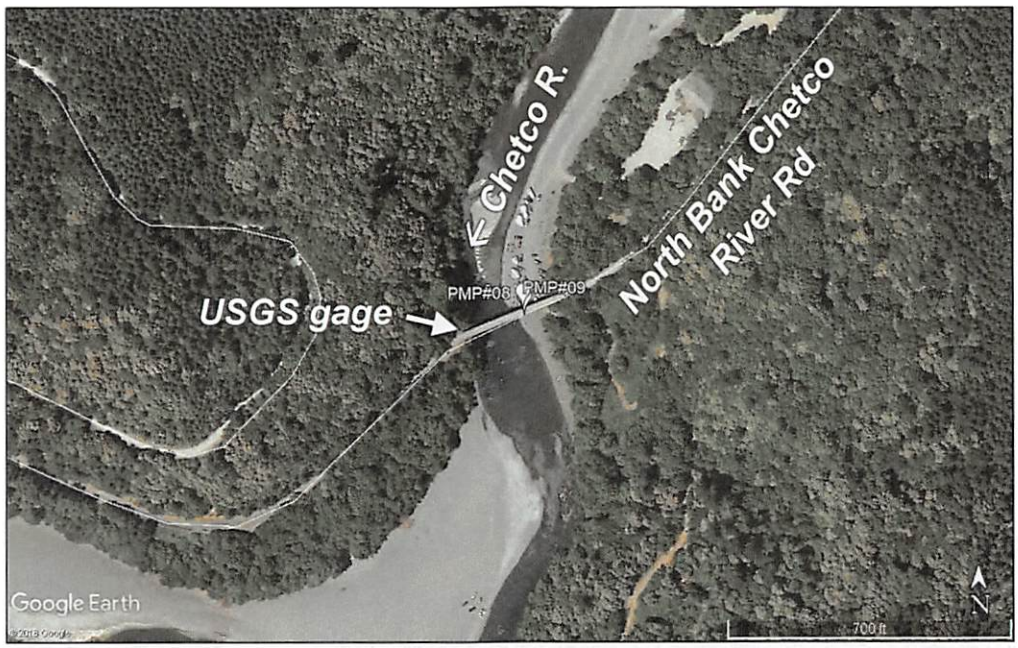


Figure A-4. Overview of photo monitoring points established at the North Bank Chetco River Road bridge (imagery source Google Earth, dated July 2, 2016).

Figure A-5. Overview of photo monitoring points established at the confluence of the South Fork Chetco River and the mainstem Chetco River within the perimeter of the Chetco Bar Fire (imagery source Google Earth, dated July 2, 2016).

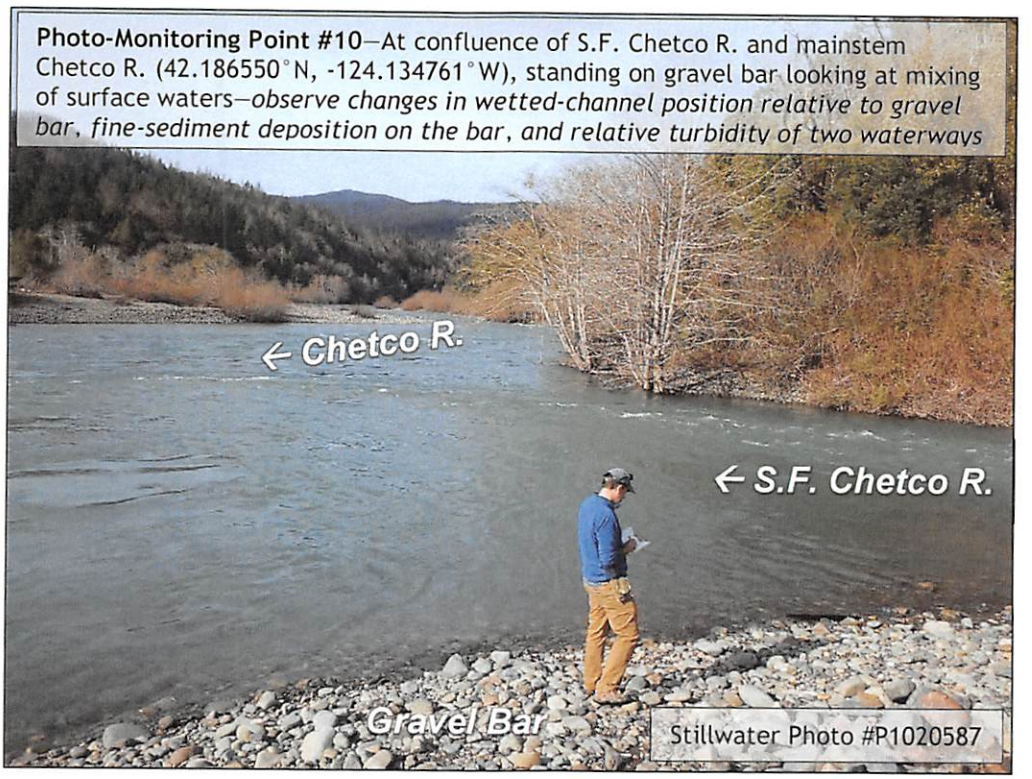


Photo-Monitoring Point #10—At confluence of S.F. Chetco R. and mainstem Chetco R. (42.186550°N, -124.134761°W), standing on gravel bar looking at mixing of surface waters—*observe changes in wetted-channel position relative to gravel bar, fine-sediment deposition on the bar, and relative turbidity of two waterways*
← Chetco R.
← S.F. Chetco R.
Gravel Bar
Stillwater Photo #P1020587

TECHNICAL MEMORANDUM

JACOBS

City of Brookings – Potential Drinking Water Impacts Related to the Chetco Fire

PREPARED FOR: Brian Helliwell, Project Manager – Jacobs

COPIED: Kevin Dixon, Director, Compliance and Reporting – Jacobs

PREPARED BY: Rich Giani, Drinking Water Technical Compliance Coordinator – Jacobs

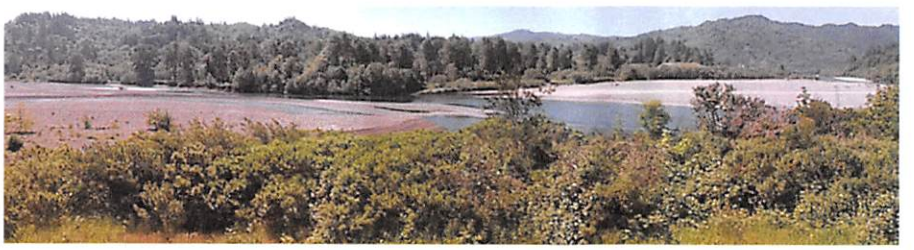
DATE: June 5, 2018

This technical memorandum summarizes the 2017 Chetco fire report conducted by GSI Water Solutions with a focus on potential impacts on the drinking water treatment system.

Introduction

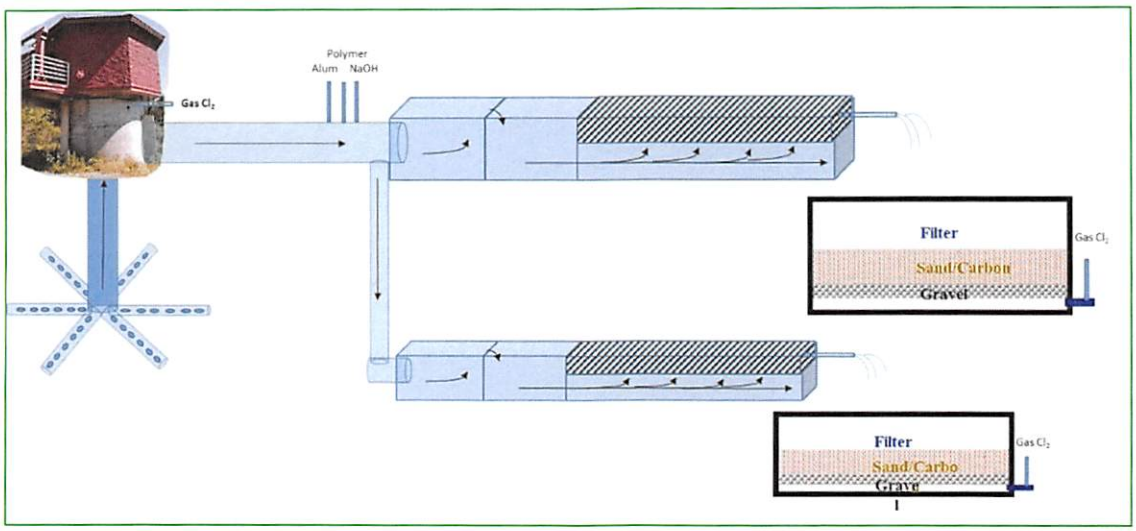
In July 2017, the start of what is known today as the largest wildfire in Oregon began. Lasting until the autumn rains, the fire burned 190,000 acres including 153,000 acres of the City of Brookings watershed (Figure 1 - Right).

The city of Brookings obtains its water through a Ranney well collector, river bank filtration system (Figure 2 - Right), approximately 40 feet below the river bed of the Chetco River (Figure 3 - Below). The system has been in operation since 1984 and is located approximately 4.6 miles from the mouth of the Chetco River. The design maximum production rate is 3.6 MGD. Average water production rates over the past year are approximately 1.2 MGD with a maximum of 1.6 MGD occurring in the summer. Water is pumped from the collector system through a transmission line to the water treatment plant located approximately two miles downstream.



The water treatment plant is a "package" plant containing two parallel trains consisting of a mixing chamber and a floc chamber (both mixer assemblies have been removed or never added), a tube settling chamber and a dual-media filter. Alum, polymer are added for floc formation and caustic soda (50%) is added for pH adjustment just prior to each train's influent. Gas chlorine (via carrier water) is dropped into the Ranney collector well in order to provide 4-log virus removal before it reaches the plant. Gas chlorine is also added at the water treatment plant effluent. Figure 4 shows a schematic of the treatment plant.

Figure 4. Schematic of the water treatment plant.



The package plant system used to operate regularly, but due to the consistent high quality of water coming from the Ranney collector system, the plant is only used if incoming turbidities are greater than 0.3 NTU, which has not occurred over the past couple of years. Under normal operations, water bypasses the package plant and enters into a clearwell before being pumped to the distribution system. Caustic soda is added prior to the clearwell and chlorine is added at the clearwell. The package plant is operated once per week for backwashing the filters to prevent biological fouling of the media.

Water Quality Data After the Chetco Fire

GSI Water Solutions was tasked to identify the potential impacts from the fire related to watershed water quality and the Ranney collector system. Two sampling events occurred from two sampling points in the watershed and from the Ranney collector system; one during a large rain event and one during a semi dry event. Key parameters that can impact drinking water quality and treatment were sampled.

In summary, two sampling events were not enough to statistically determine the impacts of the fire, however based on these two events, most of the water quality parameters appear unaffected, accept Dissolved Organic Carbon (DOC), iron and aluminum which were found in higher concentrations compared to normal during wet weather events. However, these parameters remain undetected at the Ranney well.

DOC

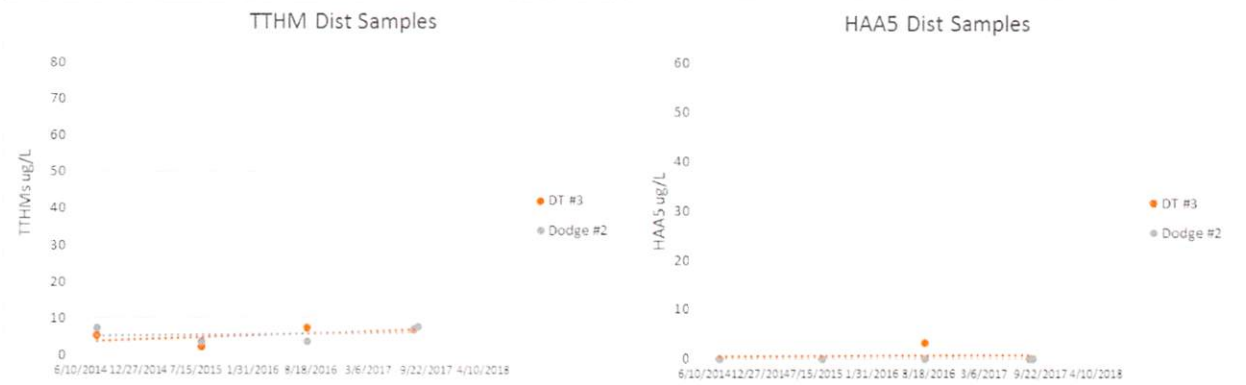
DOC can form disinfection byproducts (DBPs) when interacting with chlorine. Regulated DBPs consist of total trihalomethanes (TTHMs) and Haloacetic acids (HAA5s). Figure 5 shows the latest regulated DBP results. Historic concentrations are extremely low. TTHMs are just above detection limits while HAA5s have not been detected in the distribution system. The City is on reduced monitoring because of the low levels. As a result, DBPs are only collected once per year, although samples were collected twice in August due to the fire impacts.

The GSI Water Solutions data shows higher DOCs during a wet event in the Chetco tributaries compared to non-rain events. The Ranney system also saw an increase in DOC, but at much lower levels. DBPs typically form more rapidly in the summer with warmer temperatures, however with the long-term

impacts on the fire, it might be beneficial to take a set of DBP samples during the rainy season rather than in August, which is during the dry season, just to compare.

Higher concentrations of DOC will cause a demand on the free chlorine residual. Typical operations will require the operations staff to raise the chlorine dose if the residual begins to decline. Chlorine use is recorded (in lbs used per day) daily. Review of the chlorine use and residual data will provide a more accurate impact from DOC compared to just the two sampling events. Interview with the staff indicate that chlorine doses have not increased during the rainy season. Chlorine dose data is currently kept in hard copy. It is recommended to do a full detailed chlorine dose/chlorine demand analysis over the past 2-3 years to see if there truly are any affects. Continued daily monitoring of the chlorine dose/demand can be an excellent tool in determining if future sediment and DOC runoff is having an impact on the water quality.

Figure 5. TTHM and HAA5 concentrations since 2014.



Aluminum

Aluminum concentrations were elevated in the Chetco watershed, but were not detected in the Ranney Well. The secondary standard for aluminum is 200 µg/L. Concentrations higher than this entering the distribution system will eventually accumulate to form milky/cloudy water. It would be beneficial to monitor aluminum concentrations at the water treatment plant entry point monthly.

Iron

Iron concentrations were also elevated during rain events, but the majority of iron concentrations do not appear to be getting through to the ranney collector system, however it would also be beneficial to monitor iron concentrations monthly as iron accumulation in the distribution system can cause a future increase in customer discolored water complaints.

Turbidity

Turbidity levels remained low in the watershed data and will most likely not impact the Ranney Well. An impact from turbidity will most likely happen at a slow pace where turbidity levels will slowly increase over time (months), but should provide enough time for the staff to begin operation of the existing filter plant.

Treatment

The current package treatment plant should be able to handle any of the potential water quality changes that could result from runoff in the fire-burdened area. A process control plan is highly recommended (and required by Jacobs OM Services) so operations staff is comfortable with operating the package plant and treating water with variable turbidity and DOC. Jacobs is in the process of developing a process control plan.

Variable Speed Source Water Pumps

The GSI Water Solutions report recommends installing variable speed drives on the pumps at the Ranney Well. This is also recommended by Jacobs. Providing variable speed pumps will allow water operations staff the ability to run at a slower rate. Running at a slower rate will cause less of a burden on the natural filtering process and will probably improve water quality. In addition, it will provide the ability to raise chemical dosages for caustic soda and alum at the treatment plant if necessary.

Conclusion and Recommendations

It appears that water quality in the watershed that was impacted by the Chetco fire is currently having little impact with the source water quality coming from the Ranney Collector System. Based on the limited data, DOC, iron and aluminum increase significantly during rain events. This could have potential impact on regulated disinfection byproducts and secondary maximum contaminant levels related to inorganic material buildup in the distribution system which could eventually increase discolored\cloudy water complaints.

Recommendations

Additional Monitoring

- Monitor aluminum and iron monthly at the entry point for 12 months. Evaluate the data at the end of the monitoring period to determine any impacts or if continued monitoring is needed.
- Conduct a single distribution sampling event for disinfection byproducts during the rainy season. If results are higher than typical DBP levels, it may be best to change the regulated monitoring month.
- Monitor chlorine demand (chlorine dose and residuals) and record the data in OP 10 or electronic format so it can easily be assessed to understand patterns related to the potential for increased DOC in the Ranney Collector System.

Develop a Process Control Plan

The current package treatment plant should be able to handle any of the potential water quality changes that could result from runoff in the fire-burdened area. A process control plan is highly recommended so operations staff are comfortable with operating the plant and treating water with variable turbidity and DOC.

Install Variable Speed Pump Drives

This will maintain a higher water quality coming through the natural filter bank and will most likely extend the life of the natural filter. It will also allow the ability to add higher concentrations of treatment chemicals (i.e. caustic soda, alum, etc.) at the water plant if necessary.

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: June 25, 2018

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: Intergovernmental Agreement for Building Services

Recommended Motion:
Motion to authorize City Manager to execute Intergovernmental Agreement for Building Services between the County of Curry and the City of Brookings.

Financial Impact:
Minimal expense and revenue for this as-needed service.

Reviewed by Finance & Human Resources Director:

Background/Discussion:
The City entered into a six-month agreement with Curry County to provide Building Services in 2016 while the County sought to hire a new Building Official. The County is again recruiting for a Building Official and is assessing other options for providing building services.

A new Intergovernmental Agreement is proposed whereby the City would provide building inspection services in the unincorporated area south of Parkview Drive for up to one year, subject to further extension. Services would be provided for a maximum of six hours per week. The County would continue to perform plan check services and process permits. The proposed hourly rate is $55.00. The hourly rate is based upon the weighted hourly rate of Garrett Thomson and would include mileage for the use of a City vehicle.

The inspection services would be provided by Building Official Garrett Thomson or, possibly, another City employee currently working to secure certification.

Attachment(s):

a. Intergovernmental Agreement

INTERGOVERNMENTAL AGREEMENT
FOR BUILDING SERVICES BETWEEN
THE COUNTY OF CURRY COUNTY AND THE CITY OF BROOKINGS

I. INTRODUCTION

The Parties to this Intergovernmental Agreement (IGA) are the City of Brookings, Municipal Corporation of the State of Oregon, and Curry County, Oregon, a political subdivision of the State of Oregon.

This Agreement is entered into under authority of ORS 190.010 for the purpose of the City of Brookings providing professional building inspection services to Curry County. This agreement replaces any previous intergovernmental agreement concerning this subject between the parties.

II. GENERAL PROVISIONS

A. Definitions as Used in this Agreement

"Board of Commissioners or Board" means the Curry County Board of Commissioners.

"Building Official" means the Brookings Building Official.

"City" means the City of Brookings City Manager.

"City Building Inspector" means the Brookings Building Official.

"Community Development Director" means the Community Development Director by Curry County.

"County" means Curry County, a political subdivision of the State of Oregon.

"County Administrator" means the Curry County Administrator.

"IGA" means Intergovernmental Agreement or Agreement.

B. Authority

The Board hereby designates the Community Development Director to:
1. Administer this IGA and
2. With the concurrence of the County Administrator, extend the IGA terms when s/he finds the extension to be necessary and the City and the County mutually agree upon the extension under the terms of Section VI.
3. Revise the IGA scope of work when s/he finds the extension to be necessary consistent with the terms outlined in Section VII.

III. PARAMETERS OF THIS AGREEMENT

The City and County agree that:

1. The City will provide, under the direction of the Building Official, residential plumbing, and commercial structural, conventional framed residential, manufactured and residential mechanical inspection services upon a 24 hour notice from the County. The service area is generally from Parkview Drive to the California border. Other areas may be considered at the discretion of the Building Official.

2. The Building Inspector will be available up to six (6) hours a week.

IV. COMPENSATION TO BE PROVIDED BY THE COUNTY

The billing rate for services provided by the Building Inspector is $55.00/hour for the services described in Section III.

V. OTHER PROVISIONS

A. City Building Inspector employment Status While Serving the County

1. The City Building Inspector is not an employee of the County for purposes of compensation, benefits or other personnel related matters.
2. The Building Inspector is covered by the City's liability insurance and worker's compensation insurance.

B. Files and Records

1. The County will provide the City Building Inspector with a copy of all application forms, report forms, and other related materials to be used in the conduct of building inspections.

2. Except as otherwise provided, all original files and records related to the County's Building Permit applications shall be retained in files at the County offices for the term of the agreement.

VI. TERM AND TERMINATION

A. Term

1. This agreement shall commence on July 2, 2018 for a period of one (1) year; this term may be renewed annually by the City Manager and County Manager or his/her designee. This agreement supersedes any prior agreement between both parties for Building services.
2. The agreement time commitment may be extended subject to the terms noted in Section III for a period of time mutually agreeable to the City Manager and the County Manager.
3. The Agreement may be terminated by either party thirty (30) working days following notification as specified in a. below under the following procedure:
    a. the party requesting termination shall notify the other party in writing of its intention to terminate; and
    b. upon termination of the agreement by party, any files, records and correspondence related to applications shall be returned to the County.
    c. termination shall not prejudice any rights of the parties that have accumulated prior to the effective date of termination.

VII. MODIFICATION

No modification of this Agreement shall be valid unless in writing and signed by the parties.

The Community Development Director may authorize a modification to this agreement related to the scope of building services noted in Section III. Modification of the scope of services is limited to additional types of building inspection services not specified in Section III.

If any provision of this Agreement is held by any court of competent jurisdiction to be invalid, such invalidity shall not affect any other provisions of this Agreement, and this Agreement shall be construed as if the invalid provision had never been included in the Agreement.

VIII. INDEMNIFICATION

County shall hold harmless, defend and indemnify the City and its officers, employees, and agents for any and all claims, suits or actions arising out of work that the City performs for the County under this agreement. County shall name the City as an additional insured for work performed under this agreement.

IN WITNESS WHEREOF, this Intergovernmental Agreement between the City of Brookings and Curry County is signed and executed this 20th day of June, 2018.

_____ _____

Gary Milliman
City Administrator
City of Brookings

Date

_____ _____

Sue Gold
Board of Commissioners Chairperson

Date

_____ _____

Tom Huxley
Board of Commissioners Vice-Chair

Date

_____ _____

Court Boice
Board of Commissioners

Date

Approved as to form:

_____ _____

John Huttl
Curry County Counsel

Date

City of Brookings
CITY COUNCIL MEETING MINUTES

City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415
Monday, June 11, 2018

Call to Order

Mayor Pieper called the meeting to order at 7:00 PM.

Roll Call

Council present: Mayor Jake Pieper, Councilors Bill Hamilton, Brent Hodges, Ron Hedenskog, and Dennis Triglia present; a quorum present.

Staff present: City Manager Gary Milliman, Finance & Human Resources Director Janell Howard, City Attorney Martha Rice, Parks & Planning Manager Tony Baron, Administrative Aide Rita Ritz, and City Recorder Teri Davis.

Media Present: Jane Stebbins from Curry Pilot present

Others Present: Approximately 28 audience members.

Ceremonies/Appointments

Appoint Barbara Ciaramella to TPAC

Councilor Hedenskog moved, Councilor Hamilton seconded and Council voted unanimously to appoint Barbara Ciaramella to TPAC.

Americanism Week Proclamation

Councilor Hedenskog moved, Councilor Hamilton seconded and Council voted unanimously to authorize the Mayor to proclaim June 11-17, 2018 as "Supreme Americanism Week."

-Mayor Pieper read the proclamation and presented it to members of the Supreme Emblem Club.
-Club representative Terry Clawson addressed Council presenting a summary of club activities

Resolutions

Appointing City Representative to the Border Coast Regional Airport Authority

City Manager Milliman presented the staff report.

Councilor Hedenskog moved, Councilor Hodges seconded and Council voted unanimously to adopt Resolution 18-R-1131*, appointing Gary Milliman as City Representative to the Border Coast Regional Airport Authority and appointing Janell Howard as alternate.

***Resolution was incorrectly presented as 18-R-1132 and was edited post-meeting to reflect the correct number of 18-R-1131**

Appointing City Representative to the South West Area Commission on Transportation

Councilor Triglia moved, Councilor Hamilton seconded and Council voted unanimously to adopt Resolution 18-R-1138, appointing Gary Milliman as City Representative to the South West Area Commission on Transportation and appointing Janell Howard as alternate.

Oral Requests and Communications from the audience

1. Carolyn Milliman of 1090 Parkview Dr, Brookings addressed Council thanking it for its support of the Pistol River Wave Bash and also informing the summer KASPER program is underway
2. Lauren Paulson of 16131 W. Hoffeldt Ln. #38, Brookings addressed Council regarding
   a. The Chetco Bar Fire
   b. The 911 Proposal
   c. The Police Chief's retirement and replacement
   d. Affordable Housing

   Mr. Paulson submitted documents which were entered into record.

Staff Reports

Chetco River Gage Maintenance Agreement

City Manager Milliman presented the staff report.

Councilor Triglia moved, Councilor Hedenskog seconded and Council voted unanimously to authorize the City Manager to execute the joint funding agreement with the U.S. Geological Survey for maintenance of the flow gage on the Chetco River.

1st Amendment to Lone Ranch Agreement

City Manager Milliman presented the staff report.

The following individuals spoke in support of the amendment to the agreement:

1. David Paoli of 1380 Glenwood, Brookings

The following individuals spoke in opposition to the amendment to the agreement:

1. Catherine Wiley of 96370 Duley Creek, Brookings
2. Alyssa Babin of 514 Myrtle St., Brookings
3. Tony Stoddard of 16836 Thompson Rd., Brookings
4. LauRose Felicity of 217 Marine Dr., Brookings
5. Debbie Mihel of Brookings
6. Candice Michel of 1253 Rowland Ln, Brookings

The following individual addressed Council requesting more information about the topic:

1. Nick Hindman of 19921 Whaleshead Rd.

Council discussed how the project would affect water resources, the affordable housing crisis, and the appropriateness of using SDCs for this reason.

Councilor Triglia presented a prepared statement in opposition to the amendment to the agreement. The document was entered into record.

Councilor Hodges moved, Councilor Hedenskog seconded and Council voted 3-1-1 with Councilor Triglia voting 'nay' and Councilor Hamilton abstaining to authorize the Mayor to execute First Amendment to the Lone Ranch Infrastructure Financing Agreement.

Council Liaisons

City Recorder Davis presented the staff report.

Council took no action on the matter.

Consent Calendar

1. Approve Council minutes for May 29, 2018
2. Accept Parks and Recreation Commission minutes for March 22, 2018

Councilor Triglia moved, Councilor Hodges seconded and Council voted unanimously to approve the Consent Calendar.

Remarks from Mayor and Councilors

Councilor Hamilton commented that City Council tries to make the best decisions based upon the available information.

Councilor Triglia wished the LGBT community a happy Pride Month.

Mayor Pieper noted that LUBA had dismissed the case regarding the Azalea Park trees. City Manager Milliman added that the case cost the City approximately $3,000.

Adjournment

Councilor Hedenskog moved, Councilor Triglia seconded, and Mayor Pieper adjourned the meeting at 9:31 p.m.

Respectfully submitted:

ATTESTED:
this _____ day of _____ 2018:

Jake Pieper, Mayor

Teri Davis, City Recorder

BROOKINGS PLANNING COMMISSION MINUTES
May 1, 2018

The regular meeting of the Brookings Planning Commission was called to order by Chair Bryan Tillung, at 7:01 PM in the Council Chambers at Brookings City Hall.

Commissioners Present: Skip Hunter, Cheryl McMahan, Loren Rings, Bryan Tillung, Gerry Wulkowicz
Staff Present: Parks & Planning Manager – Tony Baron; Administrator - Lauri Ziemer
Others Present: 10 audience members

PUBLIC HEARINGS

Public hearing procedures were addressed by Chair Tillung.

- Chair Tillung opened the quasi-judicial hearing regarding File No. CUP-1-18

  File Description: In the matter of the File No. CUP-1-18, a request for approval of a Conditional Use Permit to operate a Short Term Rental facility at 609 Meadow Lane, a 0.99 acre parcel located on Assessor's Map No. 40-13-31DD; Tax Lot 1500. The applicant/owner is Jason & Caroline Covington. The criteria used to decide this matter is found in Section 17.124.170 – Short-term rentals, Chapter 17.136 - Conditional Uses, and Section 17.20.040(Q) Single-Family Residential (R-1-6) Conditional uses of the Brookings Municipal Code (BMC). This is a Quasi-judicial hearing and the Planning Commission will make a decision on the matter.

There was no ex parte contact or conflict of interest declared. There was no objection to the jurisdiction of the Planning Commission to hear the matter. The public hearing was opened at 7:05 PM. Parks and Planning Manager Tony Baron reviewed the staff report.

Applicant Jason Covington, 2313 E 1450 S, Spanish Fork, Utah described the reason for requesting a conditional use permit to operate a short term rental and was there to answer any questions.

Doug Hutton, 601 Meadow Lane, Brookings stated he was opposed to a vacation rental in the neighborhood and stated that the lawn is not maintained and the trash cans remain on the street.

Holly Beyer, 625 Meadow Lane, Brookings stated she was concerned about the rental aspect and the influx of unknown people at the property along with pets and the yard is not fenced. Also concerned about possible loud parties and noise disrupting a quiet neighborhood.

Kathy Jirsa, 619 Meadow Lane, Brookings stated she was opposed to a vacation rental, unknown people in the neighborhood and the impact.

Joyce Hannun, 604 Meadow Lane, Brookings questioned if a sign was going to be installed, if visiting dogs would disrupt the neighborhood, if vehicles would be parked on the street and if there was a City noise ordinance.

Applicant Jason Covington addressed the neighbors concerns by advising that the home will be rented for only three days or more, background checks will be conducted on renters, and advise renters no loud parties are allowed. He will have a local property manager to take care of the lawn maintenance and trash. No animals will be allowed, no sign is going to be put up and the renters will have parking for two vehicles in the garage and four vehicles in the driveway. He will provide neighbors with his phone numbers and the property manager to address any concerns with renters.

Parks and Planning Manager Tony Baron advised that the City does have a noise ordinance and neighbors can call the police who will cite the parties involved.

No participant requested additional time to submit materials and the representative did not request additional time for written rebuttal. The public hearing was closed at 7:34 PM.

The Commission deliberated on the matter. Commissioner Wulkowicz explained to the audience the Conditions of Approval for short term rentals and if issues arise, the Conditional Use Permit be revoked. By a 5-0 vote (Motion: Wulkowicz, 2nd Rings) the Planning Commission approved File No. CUP-1-18 as presented.

Commissioner Wulkowicz made a motion to approve the final order as presented, which was seconded by Chair Tillung. The final order was approved by unanimous vote.

- Chair Tillung opened the quasi-judicial hearing regarding File No. CUP-2-18

  File Description: In the matter of the File No. CUP-2-18, a request for approval of a Conditional Use Permit to operate a marijuana concentrate extraction and distillation facility at 648 Hemlock, a 0.76 acre parcel located on Assessor's Map No. 41-13-06DA; Tax Lot 4900. The applicant is Chris Swick. The criteria used to decide this matter is found in Section 17.52.040 (N) – Conditional Uses and Chapter 17.136 - Conditional Uses of the Brookings Municipal Code (BMC). This is a Quasi-judicial hearing and the Planning Commission will make a decision on the matter.

There was no ex parte contact or conflict of interest declared. There was no objection to the jurisdiction of the Planning Commission to hear the matter. The public hearing was opened at 7:37 PM. Parks and Planning Manager Tony Baron reviewed the staff report.

Applicant Chris Swick, PO Box 7583, Brookings, explained that his business is OLCC regulated and licensed with the state and was there to answer any questions.

A letter from Robert and Doris Allsup, PO Box 2053, Brookings, was read into the record, objecting to the permitting of another marijuana business in Brookings.

Applicant Chris Swick addressed those concerns by advising that this was not a retail business and he will not be selling marijuana to the public.

Commissioner Rings questioned how left over material after processing was disposed of. Applicant stated there is no material left over and any trash will be disposed of in trash bags and picked up by CTR.

No participant requested additional time to submit materials and the representative did not request additional time for written rebuttal. The public hearing was closed at 7:52 PM.

The Commission deliberated on the matter. By a 5-0 vote (Motion: Wulkowicz, 2nd McMahan) the Planning Commission approved File No. CUP-2-18 as presented.

Commissioner Wulkowicz made a motion to approve the final order as presented, which was seconded by Commissioner McMahan. The final order was approved by unanimous vote.

APPROVAL of MINUTES

By a 3-0 vote (motion: McMahan, 2nd Rings, with Commissioners Wulkowicz and Chair Tillung abstaining due to absence from the meeting) the Planning Commission approved the minutes of the February 6, 2018 Planning Commission meeting as presented.

PLANNING STAFF REPORT

Staff presented the 2017 Committee for Citizen Involvement report as required by resolution 399. By a 5-0 vote (motion: Wulkowicz, 2nd Rings) the Commission accepted the CCI annual report. The report will be forwarded to the City Council.

CHAIR ANNUAL REPORT

Chair Tillung presented the annual report that summarized the Commission's activities for 2017. By a 5-0 vote (motion: Wulkowicz; 2nd Rings) the Planning Commission accepted the report. The report will be forwarded to the City Council.

ELECTION OF CHAIR AND VICE-CHAIR

Commissioner Wulkowicz nominated Chair Tillung to continue as Chair for 2018, seconded by Commissioner Rings. By a 5-0 vote, Chair Tillung was reappointed as chair for 2018.

Commissioner Wulkowicz nominated Commissioner Rings as Vice-chair for 2018, seconded by Commissioner McMahan. By a 5-0 vote, Commissioner Rings was appointed vice-chair for 2018.

ADJOURNMENT

Meeting adjourned at 8:00 P.M.

Respectfully submitted,

Chair, Brookings Planning Commission
Approved at the June 5, 2018 meeting

TOURISM PROMOTION ADVISORY COMMITTEE (TPAC) MINUTES
Thursday – May 10, 2018

CALL TO ORDER
Meeting called to order at 4:06 PM

1. ROLL CALL
Present: Committee members Candice Michel, Sonya Billington, Dane Tippman, and Skip Watwood.
Also present: Staff Committee Liaison Teri Davis

2. APPROVAL OF MINUTES –
Motion made by Candice Michel to approve the minutes of April 12, 2018, motion seconded by Sonya Billington and Committee voted; the motion carried unanimously.

3. Modification to Agenda
Motion made by Candice Michel to add Rock the Chetco to the agenda as Item 4b, motion seconded by Sonya Billington and Committee voted; the motion carried unanimously.

4. Public Comment – There was no one present to address the Committee on non-agenda items.

5. ACTION ITEMS
a. Travel Oregon Medium Competitive Grant – Teri Davis presented
- Requested amount of TOT funds is $2,790
- Funds to be taken from TPAC Capital funds

Motion made by Candice Michel to recommend to City Council to authorize staff submittal of a Travel Oregon Medium Competitive Grant application and to allocate up to $2,790 in Transient Occupancy Tax funds for a portion of the 25 percent required match, and to provide a committee Letter of Support to accompany the grant application, motion seconded by Sonya Billington and Committee voted; the motion carried unanimously.

b. Rock the Chetco – Michael Frederick presented.
- Requesting $3,000 in TOT funding

Motion made by Candice Michel to grant $3,000 in TOT funds to the Rock the Chetco event, motion seconded by Skip Watwood and Committee voted; the motion carried unanimously.

5. INFORMATIONAL ITEMS
a. Event Calendar – not presented
b. Recent Council Actions – Teri Davis presented
c. Budget Status & Internet Hit Info – Committee reviewed the budget status and the internet hits for the month
d. Video Update - Candice Michel announces the Harris Beach State Park video is complete and going through the final approval processes.

7. SCHEDULE NEXT MEETING – Next meeting scheduled for June 14, 2018.

8. ADJOURNMENT – with no further business before the Committee, meeting adjourned at 4:37 pm.

Respectfully submitted,

Skip Watwood, Chair
(approved at June 14, 2018 meeting)

CITY OF BROOKINGS
FUND SUMMARY
FOR THE 11 MONTHS ENDING MAY 31, 2018

GENERAL FUND

		BUDGET	PERIOD ACTUAL	YTD ACTUAL	REMAINING BUDGET	PCNT
	REVENUE					
	TAXES	2,914,282.00	71,706.90	2,877,346.32	36,935.68	98.7
	LICENSES AND PERMITS	110,900.00	11,063.80	101,431.28	9,468.72	91.5
	INTERGOVERNMENTAL	227,300.00	5,626.28	156,308.09	70,991.91	68.8
	CHARGES FOR SERVICES	165,000.00	3,719.77	146,282.17	18,717.83	88.7
	OTHER REVENUE	171,000.00	21,996.69	187,637.66	(16,637.66)	109.7
	TRANSFERS IN	488,587.00	.00	.00	488,587.00	.0
		4,077,069.00	114,113.44	3,469,005.52	608,063.48	85.1
	EXPENDITURES					
JUDICIAL:						
	PERSONAL SERVICES	24,561.00	2,417.17	22,821.79	1,739.21	92.9
	MATERIAL AND SERVICES	11,850.00	447.24	7,453.94	4,396.06	62.9
	CAPITAL OUTLAY	.00	.00	.00	.00	.0
		36,411.00	2,864.41	30,275.73	6,135.27	83.2
LEGISLATIVE/ADMINISTRATION:						
	PERSONAL SERVICES	194,964.00	15,176.77	191,633.18	3,330.82	98.3
	MATERIAL AND SERVICES	98,400.00	8,404.17	110,088.05	(11,688.05)	111.9
	CAPITAL OUTLAY	.00	.00	.00	.00	.0
		293,364.00	23,580.94	301,721.23	(8,357.23)	102.9
POLICE:						
	PERSONAL SERVICES	2,114,007.00	192,361.46	1,861,296.50	252,710.50	88.1
	MATERIAL AND SERVICES	170,800.00	13,853.92	137,611.29	33,188.71	80.6
	CAPITAL OUTLAY	.00	.00	14,306.93	(14,306.93)	.0
	DEBT SERVICE	55,150.00	.00	20,374.46	34,775.54	36.9
	TRANSFERS OUT	.00	.00	.00	.00	.0
		2,339,957.00	206,215.38	2,033,589.18	306,367.82	86.9
FIRE:						
	PERSONAL SERVICES	187,554.00	14,472.40	164,648.87	22,905.13	87.8
	MATERIAL AND SERVICES	103,000.00	4,357.65	65,329.16	37,670.84	63.4
	CAPITAL OUTLAY	.00	.00	.00	.00	.0
	DEBT SERVICE	45,519.00	.00	38,047.96	7,471.04	83.6
	TRANSFERS OUT	.00	.00	.00	.00	.0
		336,073.00	18,830.05	268,025.99	68,047.01	79.8

CITY OF BROOKINGS
FUND SUMMARY
FOR THE 11 MONTHS ENDING MAY 31, 2018

GENERAL FUND

	BUDGET	PERIOD ACTUAL	YTD ACTUAL	REMAINING BUDGET	PCNT
PLANNING AND BUILDING:					
PERSONAL SERVICES	174,119.00	10,190.82	129,939.88	44,179.12	74.6
MATERIAL AND SERVICES	90,800.00	6,654.49	17,772.15	73,027.85	19.6
CAPITAL OUTLAY	.00	.00	.00	.00	.0
TRANSFERS OUT	.00	.00	.00	.00	.0
	264,919.00	16,845.31	147,712.03	117,206.97	55.8
PARKS & RECREATION:					
PERSONAL SERVICES	246,173.00	16,791.09	197,432.83	48,740.17	80.2
MATERIAL AND SERVICES	87,200.00	6,420.50	81,602.23	5,597.77	93.6
CAPITAL OUTLAY	.00	.00	.00	.00	.0
DEBT SERVICE	49,000.00	4,031.88	44,350.68	4,649.32	90.5
TRANSFERS OUT	.00	.00	.00	.00	.0
	382,373.00	27,243.47	323,385.74	58,987.26	84.6
FINANCE AND HUMAN RESOURCES:					
PERSONAL SERVICES	194,630.00	15,224.79	175,481.66	19,148.34	90.2
MATERIAL AND SERVICES	33,700.00	408.91	22,048.90	11,651.10	65.4
CAPITAL OUTLAY	.00	.00	.00	.00	.0
	228,330.00	15,633.70	197,530.56	30,799.44	86.5
SWIMMING POOL:					
PERSONAL SERVICES	61,112.00	.00	51,286.17	9,825.83	83.9
MATERIAL AND SERVICES	43,000.00	1,892.85	21,761.15	21,238.85	50.6
CAPITAL OUTLAY	.00	.00	.00	.00	.0
	104,112.00	1,892.85	73,047.32	31,064.68	70.2
NON-DEPARTMENTAL:					
MATERIAL AND SERVICES	145,500.00	9,411.21	81,636.89	63,863.11	56.1
CAPITAL OUTLAY	.00	.00	.00	.00	.0
TRANSFERS OUT	243,500.00	.00	.00	243,500.00	.0
CONTINGENCIES AND RESERVES	652,530.00	.00	.00	652,530.00	.0
	1,041,530.00	9,411.21	81,636.89	959,893.11	7.8
	5,027,069.00	322,517.32	3,456,924.67	1,570,144.33	68.8
	(950,000.00)	(208,403.88)	12,080.85	(962,080.85)	1.3

CITY OF BROOKINGS
FUND SUMMARY
FOR THE 11 MONTHS ENDING MAY 31, 2018

STREET FUND

	BUDGET	PERIOD ACTUAL	YTD ACTUAL	REMAINING BUDGET	PCNT
REVENUE					
INTERGOVERNMENTAL	485,000.00	41,145.44	342,590.36	142,409.64	70.6
OTHER REVENUE	13,650.00	2,109.00	10,544.67	3,105.33	77.3
TRANSFER IN	.00	.00	.00	.00	.0
	498,650.00	43,254.44	353,135.03	145,514.97	70.8
EXPENDITURES					
EXPENDITURES:					
PERSONAL SERVICES	205,515.00	12,066.90	160,539.91	44,975.09	78.1
MATERIAL AND SERVICES	205,000.00	6,781.32	173,435.41	31,564.59	84.6
CAPITAL OUTLAY	107,000.00	350.00	8,764.90	98,235.10	8.2
DEBT SERVICE	27,583.00	1,717.04	18,887.38	8,695.62	68.5
TRANSFERS OUT	31,582.00	.00	.00	31,582.00	.0
CONTINGENCIES AND RESERVES	121,970.00	.00	.00	121,970.00	.0
	698,650.00	20,915.26	361,627.60	337,022.40	51.8
	698,650.00	20,915.26	361,627.60	337,022.40	51.8
	(200,000.00)	22,339.18	(8,492.57)	(191,507.43)	(4.3)

CITY OF BROOKINGS
FUND SUMMARY
FOR THE 11 MONTHS ENDING MAY 31, 2018

WATER FUND

	BUDGET	PERIOD ACTUAL	YTD ACTUAL	REMAINING BUDGET	PCNT
REVENUE					
SOURCE 03	.00	.00	.00	.00	.0
CHARGES FOR SERVICES	1,637,000.00	132,081.48	1,489,501.81	147,498.19	91.0
OTHER INCOME	54,500.00	2,680.00	49,616.46	4,883.54	91.0
TRANSFERS IN	.00	.00	.00	.00	.0
	1,691,500.00	134,761.48	1,539,118.27	152,381.73	91.0
EXPENDITURES					
WATER DISTRIBUTION:					
PERSONAL SERVICES	361,597.00	27,491.58	291,897.06	69,699.94	80.7
MATERIAL AND SERVICES	197,500.00	5,737.32	166,011.50	31,488.50	84.1
CAPITAL OUTLAY	50,000.00	6,761.45	37,800.90	12,199.10	75.6
DEBT SERVICE	14,900.00	398.39	4,382.30	10,517.70	29.4
TRANSFERS OUT	.00	.00	.00	.00	.0
	623,997.00	40,388.74	500,091.76	123,905.24	80.1
WATER TREATMENT:					
PERSONAL SERVICES	311,891.00	8,359.33	235,849.62	76,041.38	75.6
MATERIAL AND SERVICES	242,000.00	38,053.57	238,495.83	3,504.17	98.6
CAPITAL OUTLAY	20,500.00	.00	2,384.49	18,115.51	11.6
DEBT SERVICE	14,900.00	398.39	4,382.30	10,517.70	29.4
TRANSFERS OUT	589,386.00	.00	.00	589,386.00	.0
CONTINGENCIES AND RESERVES	178,826.00	.00	.00	178,826.00	.0
	1,357,503.00	46,811.29	481,112.24	876,390.76	35.4
DEPARTMENT 24:					
CAPITAL OUTLAY	.00	.00	.00	.00	.0
	.00	.00	.00	.00	.0
	1,981,500.00	87,200.03	981,204.00	1,000,296.00	49.5
	(290,000.00)	47,561.45	557,914.27	(847,914.27)	192.4

CITY OF BROOKINGS
FUND SUMMARY
FOR THE 11 MONTHS ENDING MAY 31, 2018

WASTEWATER FUND

	BUDGET	PERIOD ACTUAL	YTD ACTUAL	REMAINING BUDGET	PCNT
REVENUE					
SOURCE 03	(4,500.00)	.00	.00	(4,500.00)	.0
CHARGES FOR SERVICES	3,129,300.00	257,612.68	2,864,500.69	264,799.31	91.5
OTHER REVENUE	10,000.00	.00	13,103.80	(3,103.80)	131.0
TRANSFER IN	.00	.00	.00	.00	.0
	3,134,800.00	257,612.68	2,877,604.49	257,195.51	91.8
EXPENDITURES					
WASTEWATER COLLECTION:					
PERSONAL SERVICES	528,144.00	35,883.55	437,249.90	90,894.10	82.8
MATERIAL AND SERVICES	243,700.00	8,176.42	130,228.71	113,471.29	53.4
CAPITAL OUTLAY	15,000.00	448.00	13,092.49	1,907.51	87.3
DEBT SERVICE	14,900.00	398.39	4,382.31	10,517.69	29.4
TRANSFERS OUT	149,966.00	.00	.00	149,966.00	.0
	951,710.00	44,906.36	584,953.41	366,756.59	61.5
WASTEWATER TREATMENT:					
PERSONAL SERVICES	536,014.00	7,294.99	385,204.14	150,809.86	71.9
MATERIAL AND SERVICES	582,300.00	79,097.76	487,880.36	94,419.64	83.8
CAPITAL OUTLAY	10,000.00	.00	2,384.49	7,615.51	23.8
DEBT SERVICE	14,900.00	398.39	4,382.31	10,517.69	29.4
TRANSFERS OUT	1,230,044.00	.00	.00	1,230,044.00	.0
CONTINGENCIES AND RESERVES	314,332.00	.00	.00	314,332.00	.0
	2,687,590.00	86,791.14	879,851.30	1,807,738.70	32.7
	3,639,300.00	131,697.50	1,464,804.71	2,174,495.29	40.3
	(504,500.00)	125,915.18	1,412,799.78	(1,917,299.78)	280.0

CITY OF BROOKINGS
FUND SUMMARY
FOR THE 11 MONTHS ENDING MAY 31, 2018

URBAN RENEWAL AGENCY FUND

		BUDGET	PERIOD ACTUAL	YTD ACTUAL	REMAINING BUDGET	PCNT
	REVENUE					
	TAXES	534,592.00	4,256.29	551,075.97	(16,483.97)	103.1
	INTERGOVERNMENTAL	.00	.00	.00	.00	.0
	OTHER REVENUE	3,000.00	.07	7,453.16	(4,453.16)	248.4
	TRANSFERS IN	.00	.00	.00	.00	.0
		537,592.00	4,256.36	558,529.13	(20,937.13)	103.9
	EXPENDITURES					
GENERAL:						
	PERSONAL SERVICES	.00	.00	.00	.00	.0
	MATERIAL AND SERVICES	35,000.00	35.94	3,276.96	31,723.04	9.4
	CAPITAL OUTLAY	391,853.00	.00	.00	391,853.00	.0
	DEBT SERVICE	.00	.00	.00	.00	.0
	TRANSFERS OUT	450,739.00	.00	.00	450,739.00	.0
	CONTINGENCIES AND RESERVES	.00	.00	.00	.00	.0
		877,592.00	35.94	3,276.96	874,315.04	.4
DEPARTMENT 20:						
	CAPITAL OUTLAY	.00	.00	.00	.00	.0
		.00	.00	.00	.00	.0
DEPARTMENT 22:						
	MATERIAL AND SERVICES	.00	.00	.00	.00	.0
	DEBT SERVICE	.00	.00	.00	.00	.0
		.00	.00	.00	.00	.0
DEPARTMENT 24:						
	CONTINGENCIES AND RESERVES	.00	.00	.00	.00	.0
		.00	.00	.00	.00	.0
		877,592.00	35.94	3,276.96	874,315.04	.4
		(340,000.00)	4,220.42	555,252.17	(895,252.17)	163.3

City of Brookings

Urban Renewal Agency Meeting MINUTES

City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415
Tuesday, May 29, 2018

Call to Order
Chair Pieper called the meeting to order at 10:02 PM, immediately following the City Council meeting.

Roll Call
Agency present: Chair Jake Pieper, Directors Bill Hamilton, Brent Hodges, Ron Hedenskog and Dennis Triglia; a quorum present.

Staff present: City Manager Gary Milliman, City Attorney Martha Rice, Finance and Human Resources Director Janell Howard, and City Recorder Teri Davis.

Agency minutes
Director Hedenskog moved, Director Triglia seconded and Council voted unanimously to approve the December 11, 2017 Agency minutes as written.

Staff Reports
Public Hearing and Approval of Agency Appropriations for the 2018-19, Fiscal Year Budget

Finance and Human Resources Director Howard provided the staff report.

Chair Pieper opened the Public Hearing regarding adoption of the Agency budget and making appropriations for fiscal year 2018-19 at 10:04 p.m.

With no one present to address the Agency on the matter, Chair Pieper closed the Public Hearing at 10:05 p.m.

Director Triglia moved, Director Hedenskog seconded and the Agency voted unanimously to adopt Resolution 18-R-1137, adopting the Brookings' Urban Renewal Agency's budget, declaring tax increment funding as provided under Section 1c, Article IX of the Oregon Constitution and ORS Chapter 457, and making appropriations for the 2018-19 fiscal year.

Agency Comments
Chair Pieper commented that the Railroad Street project is looking good.

Adjourn
Director Hedenskog moved, Director Triglia seconded and Council voted unanimously by voice to adjourn at 10:07 PM.

Respectfully submitted:

ATTESTED:
this _____ day of _____2018:

Jake Pieper, Chair

Teri Davis, City Recorder

BROOKINGS URBAN RENEWAL AGENCY

AGENDA REPORT

Meeting Date: June 25, 2018

Signature (submitted by)

Originating Dept: Finance & HR

City Manager Approval

Subject:

Transfer of Appropriations for FY 2017-18.

Recommended Motion:

Adopt Resolution 18-R-1145, approving appropriation transfers for the Brookings' Urban Renewal Agency for 2017-18.

Financial Impact:

There is no net impact to the General Fund Budget. Additional resources equal additional requirements in the fiscal year 2017-18 budget.

Background /Discussion:

Oregon local budget law allows municipalities to make transfers of appropriations through a resolution adopted by the governing body.

This includes receiving loan proceeds for additional capital expenditures for the Railroad Street project.

Attachment:

Resolution 18-R-1145 budget transfers

URBAN RENEWAL AGENCY OF THE CITY OF BROOKINGS

RESOLUTION 18-R-1145

A RESOLUTION OF THE URBAN RENEWAL AGENCY OF THE CITY OF BROOKINGS APPROVING APPROPRIATION TRANSFERS IN THE GENERAL FUND.

WHEREAS, the Urban Renewal Agency of the City of Brookings is a municipal corporation which is subject to Oregon Budget Law, and

WHEREAS, ORS 294.463(3) allows for a transfer of appropriation if authorized by the governing body, and

WHEREAS, the Agency anticipates receiving loan proceeds during fiscal year 2017-18, for capital expenditures on the Railroad Street project, and

NOW, THEREFORE BE IT RESOLVED THAT the Board of the Urban Renewal Agency of the City of Brookings hereby authorizes a transfer of appropriations pursuant to ORS 294.463(3).

BE IT FURTHER RESOLVED THAT the Board of the Urban Renewal Agency of the City of Brookings, Curry County, Oregon, for the fiscal year beginning July 1, 2017, and for purposes shown below are hereby revised as follow:

General Fund	
Resources:	
Loan Proceeds	$ 650,000
Requirements:	
Capital Outlay	$ (650,000)

Passed by the City Council on June 25, 2018, and made effective the same date.

Attest:

Chair Jake Pieper

City Recorder Teri Davis