

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

CIRCUIT COURT OF THE STATE OF OREGON
COUNTY OF DESCHUTES

AVION WATER COMPANY, INC., an
Oregon corporation,

Plaintiff,

v.

SOURCE WEEKLY, an assumed
business name of LAY IT OUT, INC., an
Oregon corporation,

Defendant.

Case No. 22CV18513

**DECLARATION OF STEVEN M.
WILKER IN SUPPORT OF
DEFENDANT SOURCE
WEEKLY'S OPPOSITION TO
PLAINTIFF'S MOTION FOR
SUMMARY JUDGMENT**

I, Steven M. Wilker, declare as follows:

1. I am one of the attorneys representing Defendant Source Weekly in this action. I have personal knowledge of the facts herein and am competent to testify thereto.
2. I am submitting this declaration in support of Defendant's Opposition to Plaintiff's Motion for Summary Judgment.
3. Attached as **Exhibit 1** is a true and correct copy of portions of the transcript of the June 28, 2023 deposition of Adam Jackson, an engineer at Avion Water Company, Inc. ("Avion") and Avion's corporate designee.
4. Attached as **Exhibit 2** is a true and correct copy of portions of the transcript of the June 28, 2023 deposition of Richard Bailey, secretary and treasurer of Avion and Avion's corporate designee.

1 5. Attached as **Exhibit 3** is a true and correct copy of portions of the
2 transcript of the June 28, 2023 deposition of Jason Wick, president of Avion and
3 Avion’s corporate designee.

4 6. Attached as **Exhibit 4** is a true and correct copy of Avion’s 2021
5 Draft Water Management and Conservation Plan. This document was produced
6 by Avion, Bates numbered AWC002654–AWC002727, and marked as deposition
7 exhibit 3.

8 7. Attached as **Exhibit 5** are true and correct copies of Avion’s 2022
9 tariff sheets and a letter from the Oregon Public Utility Commission accepting
10 the tariff sheets, dated December 21, 2022, obtained from
11 <https://edocs.puc.state.or.us/efdocs/UBH/uw193ubh151128.pdf>. This document
12 was marked as deposition exhibit 6.

13 8. Attached as **Exhibit 6** is a true and correct copy of an email
14 between Avion employees and Bend officials dated January 13, 2020. This
15 document was produced by Avion, Bates numbered AWC002421, and marked as
16 deposition exhibit 7.

17 9. Attached as **Exhibit 7** is a true and correct copy of an easement
18 between the City of Bend and Avion, recorded with the Deschutes County Clerk
19 and marked as document number 2009-05125, obtained from
20 [https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentIm](https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentImage?year=2009&itemId=5125)
21 [age?year=2009&itemId=5125](https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentImage?year=2009&itemId=5125). This document was marked as deposition exhibit

22 10.

23 ///

24 ///

25 ///

26 ///

1 10. Attached as **Exhibit 8** is a true and correct copy of an easement
2 between the Sunset View Estates Homeowners Association, Inc. and Avion,
3 recorded with the Deschutes County Clerk and marked as document number
4 2021-09201, obtained from
5 [https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentIm](https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentImage?year=2021&itemId=9201)
6 [age?year=2021&itemId=9201](https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentImage?year=2021&itemId=9201). This document was marked as deposition exhibit
7 11.

8 11. Attached as **Exhibit 9** is a true and correct copy of an email
9 exchange between Avion president Jason Wick and Bend city manager Eric
10 King, dated February 5 to 6, 2013. This document was produced by Avion, Bates
11 numbered AWC000015, and marked as deposition exhibit 14.

12 12. Attached as **Exhibit 10** is a true and correct copy of an email from
13 Avion president Jason Wick to Bend officials with the subject line “ADU’s,”
14 dated January 29, 2014, and an attached letter with the subject line “Auxiliary
15 Dwelling Units (ADU’s).” This document was produced by Avion, Bates
16 numbered AWC000217– AWC000218, and marked as deposition exhibit 16.

17 13. Attached as **Exhibit 11** is a true and correct copy of an email from
18 Avion president Jason Wick to Bend officials with the subject line “New paving
19 standards,” dated July 18, 2018. This document was produced by Avion, Bates
20 numbered AWC002232, and marked as deposition exhibit 18.

21 14. Attached as **Exhibit 12** is a true and correct copy of an order of the
22 Oregon Public Utility Commission in the case *In the Matter of the Application by*
23 *Avion Water Company for Allocation of Exclusive Territory to Provide Water*
24 *Service, Pursuant to ORS 758.300 Through ORS 758.320*, dated April 18, 2001,
25 obtained from <https://apps.puc.state.or.us/orders/2001ords/01-303.pdf>. This
26 document was marked as deposition exhibit 19.

1 15. Attached as **Exhibit 13** is a true and correct copy of a document
2 titled “Advisory Report: State Leadership Must Take Action to Protect Water
3 Security for All Oregonians” published by the Oregon Secretary of State, dated
4 January 2023, obtained from [https://sos.oregon.gov/audits/documents/2023-
5 04.pdf](https://sos.oregon.gov/audits/documents/2023-04.pdf).

6 16. Attached as **Exhibit 14** is a true and correct copy of Executive
7 Order No. 2023-08, signed by Oregon governor Tina Kotek, dated March 23,
8 2023, obtained from <https://www.oregon.gov/gov/eo/eo-23-08.pdf>.

9 17. Attached as **Exhibit 15** is a true and correct copy of an article
10 titled “Analysis of 1997–2008 Groundwater Level Changes in the Upper
11 Deschutes Basin, Central Oregon,” published by the U.S. Geological Survey,
12 dated May 29, 2013, obtained from [https://www.usgs.gov/publications/analysis-
13 1997-2008-groundwater-level-changes-upper-deschutes-basin-central-oregon](https://www.usgs.gov/publications/analysis-1997-2008-groundwater-level-changes-upper-deschutes-basin-central-oregon).

14 18. Attached as **Exhibit 16** is a true and correct copy of an article by
15 Hanna Merzbach titled “Water at Home,” published by Source Weekly, dated
16 August 24, 2022, obtained from [https://www.bendsource.com/news/water-at-
17 home-17557405](https://www.bendsource.com/news/water-at-home-17557405).

18 19. Attached as **Exhibit 17** is a true and correct copy of an email
19 exchange between Hanna Merzbach and Bend officials with the subject line
20 “Source Weekly inquiry about Bend’s biggest water users,” dated May 2022.
21 This document was produced by Source Weekly and Bates numbered
22 SOURCE000001–SOURCE000011.

23 20. Attached as **Exhibit 18** is a true and correct copy of an email
24 exchange between Hanna Merzbach and Redmond officials with the subject line
25 “Source Weekly inquiry about Redmond’s biggest water users,” dated May 2022.
26

1 This document was produced by Source Weekly and Bates numbered
2 SOURCE000013–SOURCE000021.

3 21. Attached as **Exhibit 19** are true and correct copies of screenshots of
4 the following publicly available website: *Water Systems Search Results*, U.S.
5 Environmental Protection Agency, [https://sdwis.epa.gov/ords/sfdw_pub/r/sfdw/
6 sdwis_fed_reports_public/103?clear=RP](https://sdwis.epa.gov/ords/sfdw_pub/r/sfdw/sdwis_fed_reports_public/103?clear=RP).

7 22. Attached as **Exhibit 20** is a true and correct copy of the following
8 publicly available website: *QuickFacts: Bend City, Oregon*, U.S. Census Bureau,
9 <https://www.census.gov/quickfacts/bendcityoregon>.

10 23. Attached as **Exhibit 21** is a true and correct copy of a document
11 titled “The State of Public Water in the United States” published by Food &
12 Water Watch, dated 2016, obtained from [https://foodandwaterwatch.org/wp-
13 content/uploads/2021/03/report_state_of_public_water.pdf](https://foodandwaterwatch.org/wp-content/uploads/2021/03/report_state_of_public_water.pdf).

14 24. Attached as **Exhibit 22** is a true and correct copy of a document
15 titled “Private Water Utilities: Actions Needed to Enhance Ownership Data”
16 published by the U.S. Government Accountability Office, dated March 26, 2021,
17 obtained from <https://www.gao.gov/products/gao-21-291>.

18 25. Attached as **Exhibit 23** is a true and correct copy of the following
19 publicly available website: *Information about Public Water Systems*, U.S.
20 Environmental Protection Agency, [https://www.epa.gov/dwreginfo/information-
21 about-public-water-systems](https://www.epa.gov/dwreginfo/information-about-public-water-systems).

22 26. Attached as **Exhibit 24** is a true and correct copy of the following
23 publicly available website: *Water - Who We Regulate*, Oregon Public Utility
24 Commission, <https://www.oregon.gov/puc/utilities/pages/water-regulation.aspx>.

25 ///

26 ///

1 27. Attached as **Exhibit 25** is a true and correct copy of a document
2 titled “Water Management and Conservation Plan,” published by the City of
3 Bend, dated September 2021, obtained from
4 [https://www.bendoregon.gov/home/showpublisheddocument/51138/63768969755](https://www.bendoregon.gov/home/showpublisheddocument/51138/637689697554930000%20at%2012)
5 [4930000%20at%2012](https://www.bendoregon.gov/home/showpublisheddocument/51138/637689697554930000%20at%2012).

6 28. Attached as **Exhibit 26** is a true and correct copy of a document
7 titled “Integrated Water System Master Plan,” published by the City of Bend,
8 dated September 2021, obtained from
9 [https://www.bendoregon.gov/home/showpublisheddocument/51400/63771740486](https://www.bendoregon.gov/home/showpublisheddocument/51400/637717404867170000)
10 [7170000](https://www.bendoregon.gov/home/showpublisheddocument/51400/637717404867170000).

11 29. Attached as **Exhibit 27** is a true and correct copy of a document
12 titled “Water Rights in Oregon: An Introduction to Oregon’s Water Laws,”
13 published by the Oregon Water Resources Department, dated 2018, obtained
14 from <https://www.oregon.gov/owrd/WRDPublications1/aquabook.pdf>.

15 30. Attached as **Exhibit 28** is a true and correct copy of an easement
16 between Avion and Miller Pit LLC, recorded with the Deschutes County Clerk
17 and marked as document number 2020-26401, obtained from
18 [https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentIm](https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentImage?year=2020&itemId=26401)
19 [age?year=2020&itemId=26401](https://recordings.deschutes.org/DigitalResearchRoomPublic/Image/DocumentImage?year=2020&itemId=26401).

20 31. Attached as **Exhibit 29** is a true and correct copy of a screenshot of
21 the following publicly available website, showing the search results obtained
22 using search criteria “Avion Water%” as business name: *Digital Research Room*,
23 Deschutes County, <https://recordings.deschutes.org/DigitalResearchRoomPublic>.

24 ///

25 ///

26 ///

CIRCUIT COURT OF THE STATE OF OREGON
COUNTY OF DESCHUTES

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

_____)
)
 AVION WATER COMPANY, INC.,)
 an Oregon corporation,)
)
 Plaintiff)
)
 -vs-) CASE NO.: 22CV18513
)
 SOURCE WEEKLY, an assumed)
 business name of LAY IT OUT,)
 INC., an Oregon corporation,)
)
 Defendant)
 _____)

VIDEOTAPED DEPOSITION OF: ADAM JACKSON

DATE: WEDNESDAY, JUNE 28, 2023
 TIME: 9:00 A.M.
 LOCATION: BRIX LAW LLP
 15 SW COLORADO AVENUE, SUITE 3
 BEND, OREGON 97702
 REPORTER: Lee Anne McAdam
 Registered Merit Reporter #46943

A P P E A R A N C E S

FOR THE PLAINTIFF:

C. ROBERT STERINGER, ESQUIRE
Harrang Long P.C.
111 SW Columbia Street, Suite 950
Portland, Oregon 97201
Phone: 503-242-0000
Fax: 503-241-1458
Email: bob.steringer@harrang.com

FOR THE DEFENDANT:

STEVEN M. WILKER, ESQUIRE
Tonkon Torp LLP
888 SW Fifth Avenue, Suite 1600
Portland, Oregon 97204
Phone: 503-221-1440
Fax: 503-972-3740
Email: steven.wilker@tonkon.com

SASHA DUDDING, ESQUIRE
LISA ZYCHERMAN, ESQUIRE (Via Zoom)
Reporters Committee for Freedom fo the Press
1156 15th Street NW, Suite 1020
Washington, D.C. 20005
Phone: 202-795-9300
sdudding@rcfp.org
lzycherman@rcfp.org

ALSO PRESENT: Mr. Scot William Brees,
Videographer

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

I N D E X

EXAMINATION BY:	PAGE
Mr. Wilker	5

E X H I B I T S

EXHIBIT NO.		PAGE
Exhibit 1	Notice of Taking ORCP 39(C)(6) Deposition	37
Exhibit 2	Plaintiff's Response to Notice of Taking ORCP 39(C)(6) Deposition	37
Exhibit 3	Avion Water company 2021 Draft Water Management and Conservation Plan	41

1 Q. You mentioned earlier that you had a role in
2 communications with the Oregon Health Authority?

3 A. I do.

4 Q. How is the Oregon Health Authority
5 implicated in your work for Avion?

6 A. There are statutory requirements that Avion
7 has to comply with, specifically primarily it revolves
8 around new well construction. And when you construct
9 a new well, a site plan approval is required by the
10 Oregon Health Authority.

11 There are other regulatory requirements that
12 require submittals to the Oregon Health Authority or a
13 consultation, and I participate in those activities.

14 Q. How long have you been an engineer with
15 Avion?

16 A. Six years.

17 Q. And is that the only position you've held
18 with Avion?

19 A. Yes.

20 Q. Where were you employed prior to Avion?

21 A. Mill Power.

22 Q. What was your role with Mill Power?

23 A. Sales engineer.

24 Q. What does a sales engineer do?

25 A. In that company, I took calls from

1 mentioned Oregon Health Authority, I think you
2 mentioned the PUC. Do you also interact with -- with
3 officials from the city of Bend?

4 A. Yes, I do, and I mentioned that.

5 Q. Okay. What -- what kind of interactions do
6 you have with representatives of the city of Bend? Is
7 there a -- I'm looking for categorical. Is there a
8 type of -- a general type of interaction you would
9 have as an engineer for Avion?

10 A. Primarily my interactions deal with new
11 subdivision development. There is some level of
12 coordination that is desirable to make sure that we
13 are not conflicting with each other as the developer
14 creates a drawing package for a subdivision.

15 Q. And how do you know whether a particular
16 subdivision is part of the Avion service area?

17 A. It's dictated by the service map that's part
18 of the franchise agreement.

19 Q. And are there ever expansions to the service
20 map? Or have -- let's put it this way. In your six
21 years, have there been expansions to the service map
22 serviced by Avion?

23 A. Not that -- not that I would characterize as
24 expansions.

25 Q. Is there some other way you would

1 characterize them?

2 A. There have been trades of territory, there.
3 Has been one that I know of within my time there.

4 Q. With who did -- with whom was the trade?

5 A. You just said it. It's between Avion and
6 the City.

7 Q. Okay. Are there any other water providers
8 for the city of Bend?

9 A. Yes.

10 Q. That's why I was asking the question. So
11 you are aware of one trade of a service area with the
12 city of Bend?

13 A. Yes.

14 Q. And do you know what led to that trade?

15 A. It was the outcome of a desire by the
16 developer to reduce their costs, and it made sense for
17 all the parties involved. That was the driver.

18 Q. And how did it reduce the developer's costs
19 for the -- for the City and Avion to engage in a
20 trade?

21 A. It shifted territory from the City to Avion
22 in an area where Avion has better infrastructure, and
23 it shifted territory from Avion to the City in an area
24 where the City has stronger infrastructure.

25 Q. And where was the development in question

1 that -- that was the impetus for the trade, was it in
2 the area where Avion had stronger infrastructure or
3 where the City did?

4 A. It was both. It was the same developer
5 developing two parcels.

6 Q. Were they adjacent to each other or just
7 totally two separate developments?

8 A. They are miles apart.

9 Q. If you had to estimate, and I'm not asking
10 you to guess but an estimate, how often do you
11 interact with officials from the city of Bend related
12 to your work for Avion, is it a daily occurrence, a
13 weekly occurrence, monthly occurrence, something of
14 that nature?

15 A. It varies dramatically. Over the six years
16 I would average it at every two months. It's more
17 when certain developments are going on and during a
18 drawing approval package and less when there is less
19 of that development process taking place.

20 Q. And does Avion have a role in approving
21 drawings for new developments in their service area,
22 does Avion --

23 A. Yes.

24 Q. -- does Avion have to sign off on the
25 drawings that the developer submits?

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

C E R T I F I C A T E

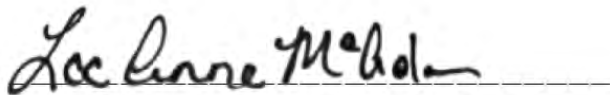
STATE OF OREGON

I, LEE ANNE McADAM, RMR, do hereby certify that pursuant to the Rules of Civil Procedure, the deposition of ADAM JACKSON was by me reduced to machine shorthand, afterwards transcribed by me by means of computer, and that to the best of my ability the foregoing is a true and correct transcript of the deposition so given as aforesaid.

I further certify that this deposition was taken at the time and place specified in the foregoing caption.

I further certify that I am not a relative, counsel or attorney for either party, or otherwise interested in the outcome of this action.

IN WITNESS WHEREOF, I have hereunto set my hand at Bend, Oregon on the 6th day of July, 2023.



LEE ANNE McADAM, RMR
NOTARY PUBLIC

My Commission expires November 21, 2026.
Notary Registration Number 1030903.

CIRCUIT COURT OF THE STATE OF OREGON
COUNTY OF DESCHUTES

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

_____)
)
 AVION WATER COMPANY, INC.,)
 an Oregon corporation,)
)
 Plaintiff)
)
 -vs-) CASE NO.: 22CV18513
)
 SOURCE WEEKLY, an assumed)
 business name of LAY IT OUT,)
 INC., an Oregon corporation,)
)
 Defendant)
 _____)

VIDEOTAPED DEPOSITION OF: RICHARD BAILEY

DATE: WEDNESDAY, JUNE 28, 2023
 TIME: 11:00 A.M.
 LOCATION: BRIX LAW LLP
 15 SW COLORADO AVENUE, SUITE 3
 BEND, OREGON 97702
 REPORTER: Lee Anne McAdam
 Registered Merit Reporter #46943

A P P E A R A N C E S

FOR THE PLAINTIFF:

C. ROBERT STERINGER, ESQUIRE
Harrang Long P.C.
111 SW Columbia Street, Suite 950
Portland, Oregon 97201
Phone: 503-242-0000
Fax: 503-241-1458
Email: bob.steringer@harrang.com

FOR THE DEFENDANT:

STEVEN M. WILKER, ESQUIRE
Tonkon Torp LLP
888 SW Fifth Avenue, Suite 1600
Portland, Oregon 97204
Phone: 503-221-1440
Fax: 503-972-3740
Email: steven.wilker@tonkon.com

SASHA DUDDING, ESQUIRE
LISA ZYCHERMAN, ESQUIRE (Via Zoom)
Reporters Committee for Freedom fo the Press
1156 15th Street NW, Suite 1020
Washington, D.C. 20005
Phone: 202-795-9300
sdudding@rcfp.org
lzycherman@rcfp.org

ALSO PRESENT: Mr. Scot William Brees,
Videographer

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

I N D E X

EXAMINATION BY:	PAGE
Mr. Wilker	5

E X H I B I T S

EXHIBIT NO.		PAGE
Exhibit 4	Bend Code - Water Service Franchise	45
Exhibit 5	Avion Water Company Accounts Payable Detail Report	51
Exhibit 6	Email dated December 21, 2022 Regarding Tariff Sheets	55
Exhibit 7	Email dated January 13, 2020 Regarding New and Final Customers Sheets	58

1 A. Can you define unique projects?

2 Q. New development that isn't necessarily
3 covered by an existing tariff or for which an existing
4 tariff might not be adequate?

5 A. It's very rare that that happens.

6 Q. Within Avion, are responsibilities divided
7 up with respect to various aspects of rate
8 applications?

9 A. Yes.

10 Q. So how are they divided up?

11 A. Adam usually helps me with updating the
12 tariff, and Debra helps me with maps and pipe totals
13 hydrant numbers, you know, the plant that we have to
14 report on.

15 Q. And Adam is Adam Jackson?

16 A. Correct.

17 Q. And he's an engineer?

18 A. Yes.

19 Q. And who's Debra?

20 A. Debra Reynolds is our SCADA and GIS manager.

21 Q. During your 17 and a half years, do you
22 recall the PUC ever declining to approve a rate tariff
23 for Avion?

24 A. No.

25 Q. Do you recall the PUC ever submitting

1 information or pushing back against a rate request
2 before ultimately approving it?

3 A. Every time.

4 Q. Are there -- is there a typical kind of
5 response to a rate request that would constitute the
6 initial response by PUC? And I'm looking for
7 generalities, what you are generally getting.

8 A. Generally they come in with a much lower
9 amount, and then as we go through questions and data
10 requests, it -- we come to an agreement.

11 Q. And does the -- does the data request center
12 on the costs you are going to incur to provide the
13 water or is there something other subject matter?

14 A. I think that's a fair description.

15 Q. And as part of the rate setting process, you
16 are trying to make sure that Avion adequately covers
17 and recovers the costs of providing the service to the
18 customer, correct?

19 A. Correct.

20 Q. Plus a permitted rate of return on those
21 sums, correct?

22 A. Correct.

23 Q. Is there a specific rate of return to which
24 you -- which the PUC allows or is it a range?

25 MR. STERINGER: Object to the form.

1 services that Avion is providing for others; is that
2 correct?

3 A. Correct.

4 Q. What kind of permit fees does Avion pay to
5 the -- to the City?

6 A. It would be normal community development
7 fees for planning when infrastructure is installed.

8 Q. What is the -- what is the annual business
9 license fee that Avion pays?

10 A. The City requires any -- any entity
11 conducting business within the city to purchase a
12 license in order to conduct business.

13 Q. And how is the license fee calculated?

14 A. I don't recall.

15 Q. Is it -- is it like a tax filing?

16 A. No.

17 Q. Does the City send you a bill?

18 A. Not anymore. It's all online and a very
19 small fee.

20 Q. So it's not a fee that turns on your
21 revenue?

22 A. No.

23 Q. What kind of monetary payments does the city
24 of Bend make to Avion?

25 A. They pay for water that is used at the

1 airport, and there might be an occasional other
2 service here or there, but those tend to come and go.

3 Q. When you say they pay for water for use at
4 the airport, does -- the City is a customer of Avion
5 at the -- at the airport?

6 A. Correct.

7 Q. And is the City as a -- the rates charged to
8 the City as a customer, is that something established
9 by PUC approved tariff?

10 A. It is. The contract -- the contract calls
11 for a reduced rate for City's water, but it's based
12 upon Avion's PUC-approved commodity charge.

13 Q. And did Avion have to get approval from the
14 PUC to charge that reduced rate to the city of Bend?

15 A. I believe so.

16 Q. Do you know why there is a reduced rate to
17 the city of Bend?

18 A. It -- it would be a courtesy between the two
19 utilities, Avion and the city of Bend water.

20 Q. Why would there be a courtesy between the
21 two utilities to your understanding?

22 MR. STERINGER: I'm going to object to the
23 question because it is outside the scope of the topics
24 designated for this witness. That's assigned to
25 Mr. Wick, but answer as you can.

1 MR. STERINGER: I'll just -- go ahead.

2 THE WITNESS: No, I did not.

3 BY MR. WILKER:

4 Q. And do you have any role in administering
5 the agreement between Avion and the city of Bend for
6 the -- for the airport agreement?

7 A. I would ultimately -- ultimately be
8 responsible for the monthly billings, and there's also
9 a clause regarding insurance coverage that I make sure
10 that we're in line with.

11 Q. Do you recall how long that agreement's been
12 in effect?

13 A. No.

14 Q. Do you know what the franchise fee
15 percentage is that Avion pays to the city of Bend?

16 A. Yes.

17 Q. And what is that?

18 A. Six percent.

19 Q. And is that a subject of negotiation or is
20 that a -- to your knowledge, is that a subject of
21 negotiation or simply a subject that the City sets the
22 rate?

23 MR. STERINGER: I'm going to object to that
24 again as being outside the scope of the topics that
25 are assigned to this witness.

1 THE WITNESS: To my knowledge that's just a
2 rate imposed by the City.

3 BY MR. WILKER:

4 Q. And to your knowledge, is that rate imposed
5 on all water providers to the city of Bend or is it
6 specific to Avion?

7 MR. STERINGER: Same objection.

8 THE WITNESS: It would -- I believe it's
9 imposed on all water utilities.

10 (An Avion Water Company Accounts Payable
11 Detail Report was marked as Exhibit 5 for
12 identification.)

13 BY MR. WILKER:

14 Q. You've been handed what I think is marked as
15 Exhibit 5, which is a -- appears to be a printout of a
16 ledger with the number AWC002741. Do you recognize
17 this document?

18 A. Yes.

19 Q. What is this document?

20 A. It is a printout of the 2022 franchise fee
21 costs and payments.

22 Q. And these are the franchise fees paid to the
23 city of Bend by Avion, correct?

24 A. Correct.

25 Q. Just so I understand the -- how this works,

1 Avion Water Company to adam@avionwater.com. Are you
2 familiar with this document?

3 A. Yes, I am.

4 Q. And what is this document to your
5 understanding?

6 A. This document is the accepted current tariff
7 of Avion Water Company effective January 1, 2023,
8 which lists the charges we are allowed to charge to
9 our customers.

10 Q. And this was a document that in the
11 application phase you were involved in preparing and
12 submitting, correct?

13 A. Correct.

14 Q. I think you testified earlier that in the
15 process of submitting the proposal to the PUC, that
16 you would occasionally or often get initial pushback
17 on the rates you wanted to charge; is that accurate?

18 A. Yes.

19 Q. And do you recall whether there was pushback
20 on this particular proposed tariff sheet?

21 A. Yes.

22 Q. And do you recall how the ultimate rates
23 compared to what you had originally submitted?

24 A. I believe they were 5 to 10 percent lower
25 than what was requested.

1 Q. And was that unusual for your rate requests
2 with the PUC?

3 A. No.

4 Q. Do you, in your role with Avion, are you
5 responsible for submitting water usage data for
6 customers to the PUC?

7 A. Yes.

8 Q. Are there any other agencies to whom you
9 submit or does Avion submit water usage data?

10 A. I'm sorry, can you repeat the question?

11 Q. Sure. Are there any other agencies apart
12 from the PUC to which Avion submits water usage data
13 for its customers?

14 MR. STERINGER: Object to the form.

15 THE WITNESS: Yes.

16 BY MR. WILKER:

17 Q. What are those agencies to your knowledge?

18 A. To the best of my knowledge, water usage is
19 reported to the Oregon Water Resources Department.

20 Q. Anyone else?

21 A. Not that I'm aware of.

22 Q. Do you know whether that data is also shared
23 with the city of Bend?

24 A. No, I do not.

25 Q. How about Deschutes County?

1 A. No, I don't know.

2 (An Email dated January 13, 2020 Regarding
3 New and Final Customers Sheets was marked as Exhibit 7
4 for identification.)

5 BY MR. WILKER:

6 Q. You've been handed what's marked as Exhibit
7 7, which is an email with a number of AWC002421. And
8 the email is from Sarah Chambers with an address of
9 sarah@avionwater.com. Do you know who Sarah is?

10 A. Yes.

11 Q. What is Sarah -- who was Sarah?

12 A. She was one of my customer service reps.

13 Q. And she's sending a To Whom It May Concern:
14 Attached are Avion Water Company's New and Final
15 Customers spreadsheets for the sewer coordination for
16 November and December 2019. Do you see that?

17 A. Yes.

18 Q. Do you know what the spreadsheets she's
19 referring to are?

20 A. Yes.

21 Q. What are they?

22 A. It was a spreadsheet designed to help the
23 City remain current in their sewer billings as to who
24 their customers were because of the overlap between
25 Avion Water and city sewer.

1 We would make -- we made an internal policy
2 decision to share that information with the City so
3 that it would hopefully reduce phone calls and
4 questions.

5 Q. When you say we made an internal decision,
6 who was involved in that decision?

7 A. It was my decision.

8 Q. Okay. And otherwise, you'd be fielding
9 questions from the City regarding who your new
10 customers were?

11 A. No.

12 Q. What kind of questions were you looking to
13 avoid?

14 A. Questions from the City asking when
15 Mr. Smith moved into a particular address because they
16 would sign up for water but not sewer.

17 Q. And the City wanted to ensure that if they
18 were using water, they were also paying for the sewer
19 services the city was providing?

20 A. Correct.

21 Q. Do you know what the difference is
22 between -- so there is four attachments referenced
23 here, and I don't have the spreadsheets, but one is --
24 two of them are referenced as city of Bend new
25 customers, November 2019 and December 2019.xls, and

1 other two are city of Bend final customers December
2 2019.xls and city of Bend final customers November
3 2019.

4 Do you know what the difference between the
5 new customers and final customers spreadsheets are?

6 A. Yes.

7 Q. What's the difference?

8 A. New customers would be customers that had
9 signed up for service, for water service within those
10 two months. Final customers would be the customers
11 that had closed their water service accounts with
12 Avion.

13 Q. So those were customers who were terminating
14 service?

15 A. Correct.

16 Q. Were they -- presumably they weren't -- they
17 were terminating service because they were leaving the
18 property?

19 A. I --

20 MR. STERINGER: Object to the form.

21 THE WITNESS: -- don't know.

22 BY MR. WILKER:

23 Q. What other reason would a customer have for
24 terminating service to your understanding?

25 A. Snowbirds terminate service. If the house

1 was going to be empty. Those are the two that come to
2 mind.

3 Q. But as I understand it, Avion had exclusive
4 water rights to distribute to those homes, correct?

5 MR. STERINGER: Object to the form.

6 BY MR. WILKER:

7 Q. Let me back up. Those customers couldn't
8 purchase water from someone else other than Avion?

9 MR. STERINGER: Object to the form.

10 BY MR. WILKER:

11 Q. Is that accurate?

12 A. To the best of my knowledge, yes.

13 Q. So if they were going to suspend service
14 because they were going to be out of -- out of the
15 property for a period of time, they would be
16 considered terminated?

17 A. Yes, at that time.

18 Q. And when they came back, they could restart
19 their service?

20 A. Correct.

21 Q. When Avion provides usage data on customer
22 usage to, I think you said the Water Resources
23 Department and the PUC, does it ever provide that data
24 on an individualized basis or is it just in aggregate?

25 MR. STERINGER: I'm going to object again

1 that that's outside the scope of topics that this
2 witness is assigned to cover.

3 THE WITNESS: For PUC reporting, no, it's
4 always reported in the aggregate. And I don't know,
5 but I don't believe it's reported individually to
6 OWRD, it's all in the aggregate.

7 BY MR. WILKER:

8 Q. And when you provide -- I don't have the
9 spreadsheets because those weren't produced that we
10 just referred to that were attached to Exhibit 7, when
11 you provide that customer data, do you provide usage
12 data in connection with those spreadsheets or just
13 identify the customers?

14 A. That was just customers identified.

15 Q. Is there any information provided to the
16 City with respect to its sewer services that tells the
17 City how much water a particular customer is using?

18 A. Yes.

19 Q. How is that provided?

20 A. In an electronic Excel sheet that's emailed
21 to the City.

22 Q. How often is that emailed to the City?

23 A. Annually.

24 MR. WILKER: I have nothing further.

25 MR. STERINGER: So I know -- well, actually,

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

C E R T I F I C A T E

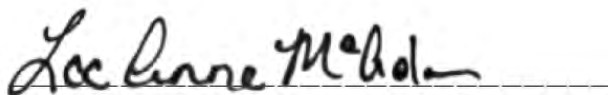
STATE OF OREGON

I, LEE ANNE McADAM, RMR, do hereby certify that pursuant to the Rules of Civil Procedure, the deposition of RICHARD BAILEY was by me reduced to machine shorthand, afterwards transcribed by me by means of computer, and that to the best of my ability the foregoing is a true and correct transcript of the deposition so given as aforesaid.

I further certify that this deposition was taken at the time and place specified in the foregoing caption.

I further certify that I am not a relative, counsel or attorney for either party, or otherwise interested in the outcome of this action.

IN WITNESS WHEREOF, I have hereunto set my hand at Bend, Oregon on the 6th day of July, 2023.



LEE ANNE McADAM, RMR

NOTARY PUBLIC

My Commission expires November 21, 2026.

Notary Registration Number 1030903.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CIRCUIT COURT OF THE STATE OF OREGON
COUNTY OF DESCHUTES

_____)
)
 AVION WATER COMPANY, INC.,)
 an Oregon corporation,)
)
 Plaintiff)
)
 -vs-) CASE NO.: 22CV18513
)
 SOURCE WEEKLY, an assumed)
 business name of LAY IT OUT,)
 INC., an Oregon corporation,)
)
 Defendant)
 _____)

VIDEOTAPED DEPOSITION OF: JASON WICK

DATE: WEDNESDAY, JUNE 28, 2023
 TIME: 1:46 P.M.
 LOCATION: BRIX LAW LLP
 15 SW COLORADO AVENUE, SUITE 3
 BEND, OREGON 97702
 REPORTER: Lee Anne McAdam
 Registered Merit Reporter #46943

A P P E A R A N C E S

FOR THE PLAINTIFF:

C. ROBERT STERINGER, ESQUIRE
Harrang Long P.C.
111 SW Columbia Street, Suite 950
Portland, Oregon 97201
Phone: 503-242-0000
Fax: 503-241-1458
Email: bob.steringer@harrang.com

FOR THE DEFENDANT:

STEVEN M. WILKER, ESQUIRE
Tonkon Torp LLP
888 SW Fifth Avenue, Suite 1600
Portland, Oregon 97204
Phone: 503-221-1440
Fax: 503-972-3740
Email: steven.wilker@tonkon.com

SASHA DUDDING, ESQUIRE
LISA ZYCHERMAN, ESQUIRE (Via Zoom)
Reporters Committee for Freedom fo the Press
1156 15th Street NW, Suite 1020
Washington, D.C. 20005
Phone: 202-795-9300
sdudding@rcfp.org
lzycherman@rcfp.org

ALSO PRESENT: Mr. Scot William Brees,
Videographer

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

I N D E X

EXAMINATION BY:	PAGE
Mr. Wilker	5

E X H I B I T S

EXHIBIT NO.		PAGE
Exhibit 8	Bend Code - Water Service Franchise	40
Exhibit 9	Right of Way Dedication Deed	56
Exhibit 10	Recorded Easement	56
Exhibit 11	Recorded Easement Sunset View Estates	57
Exhibit 12	Email Regarding McClellan and Summer Shade	61
Exhibit 13	Ordinance No. 24532	63
Exhibit 14	Emails dated February 2013 Regarding Utility Fee	64
Exhibit 15	Emails dates September 18, 2019 Regarding Affordable Housing	65
Exhibit 16	Email dated January 29, 2014 Regarding ADU's	78
Exhibit 17	Email dated January 4, 2022 Regarding Conflict Resolution	81
Exhibit 18	Email dated July 18, 2018 Regarding New Paving Standards	83
Exhibit 19	PUC Order No. 01-303	88

1 them into.

2 Q. And if -- so if I understand correctly, your
3 franchise agreement comes up for renewal again in
4 2027; is that right?

5 A. Yes.

6 Q. And does Avion have any right of renewal or
7 any preference for renewal that you are aware of?

8 A. We would like to renew it as is, but that
9 won't happen.

10 Q. Why is that?

11 A. Because there's a clause in there that
12 states that the City has to charge its customers any
13 fee that it levies against Avion's customers, and the
14 City doesn't like that clause and they want it to go
15 away.

16 We are the only people who have that clause.
17 We -- my father, when he originally negotiated it, got
18 it in there because the City is our competitor, and we
19 don't want them to levy fees against developers to
20 make them choose the city over us.

21 Q. In terms of new development?

22 A. Yeah. But that's kind of a moot point now
23 since they -- since when we did this, they got the
24 territory map in.

25 Q. Say that again?

1 Q. Yes. You said you've had no negotiations
2 with the city of Bend in the last five years-ish
3 concerning the franchise agreement. Have you had any
4 other kinds of interactions with representatives of
5 the city of Bend regarding Avion's business?

6 A. Yes.

7 Q. What did those concern?

8 A. An attempt to do a territory swap. The fact
9 that the City mistakenly took some territory from us,
10 which I'm trying to negotiate a settlement with them
11 for, some minor water politics issues, messaging on
12 conservation, and that's about all, I think.

13 Q. What kind of messaging on conservation?

14 A. Just what we're doing, what they're doing.

15 Q. And what is Avion doing on conservation?

16 A. Avion offers many ways for people to --
17 well, not many ways. We offer a Blue Water program,
18 which is you can donate a -- some money monthly that
19 gets sent to the Deschutes River Conservancy, who then
20 protects -- uses that money to purchase water to
21 protect end stream.

22 Q. And that's a voluntary program for
23 consumers?

24 A. Yes.

25 Q. How long has -- how long has Avion offered

1 that program?

2 A. I don't recall. I started it but I don't
3 recall the start date.

4 Q. More than three years?

5 A. Oh, yeah.

6 Q. And is your father still actively involved
7 in the business?

8 A. When he decides to be.

9 Q. And how often does he decide to be?

10 A. It varies. When he's in the country.

11 Q. Who is on the board of directors for Avion?

12 A. Me and Rick Bailey.

13 Q. Anyone else on the board?

14 A. Well, for Northwest Natural, yes.

15 Q. Who is their representative?

16 A. Last meeting it was David Anderson and
17 Justin Palfreyman.

18 Q. Who's Jordan Wick?

19 A. My brother.

20 Q. Is Jordan on the board -- is Jordan on
21 the --

22 A. Oh, right. How could I forget my brother?

23 Q. Does Jordan otherwise work for the company
24 or is he just on the board?

25 A. Just on the board.

1 submitted?

2 A. Yes.

3 Q. Did you have any comments or corrections to
4 the consultants who prepared it?

5 A. No. We go back and forth on the
6 conservation portion of the plan, but that's mostly
7 about it.

8 Q. And what -- what do you mean by we go back
9 and forth on the conservation part of the plan?

10 A. Because the state of Oregon has two things
11 that don't match up.

12 Q. What are the two things?

13 A. The Public Utility Commission says if we
14 have the water and you have the money, we have to sell
15 it to you. The Oregon Water Resources Department
16 wants a conservation piece. We can't conserve if you
17 aren't paying us.

18 Q. And how do you resolve those?

19 A. I don't.

20 Q. Well, you must one way or the other. You
21 are not conserving or -- or you are not selling?

22 A. Well, we offered to hand out low-flow
23 sprinkler heads, things such as that; so if you come
24 to our office, you can get a handful of low-flow
25 sprinkler heads.

1 Q. Is the -- do you have an understanding of
2 why the department, the Water Resources Department,
3 has a conservation requirement?

4 A. Yeah.

5 Q. Why?

6 A. Because it's a limited resource.

7 Q. And if I understood correctly from your
8 earlier testimony, you have the right to that limited
9 resource pursuant to a very large permit?

10 A. Several permits.

11 Q. All right. But you've described the one as
12 being very, very large. Is that -- what's that, the
13 number of that permit here?

14 A. Oh, it's changed. It's been morphed into
15 something else, but the original was Permit Number
16 12788.

17 Q. And is that -- is that permit or the permit
18 it's morphed into, is that permit responsible for the
19 largest supply of water resource to Avion?

20 A. By a little bit, by about one CFS.

21 Q. What's a CFS?

22 A. Cubic feet per second.

23 Q. And so you said it's larger by one CFS
24 compared to some other permit?

25 A. The 12788 is for about 11 -- oh, why can't I

1 think of it? Anyway, it's -- 12788 is the biggest.
2 The second one is for 10 CFS, and the third largest is
3 5 CFS, but we have a whole bunch of water permits.

4 Q. And if I understood correctly, those water
5 permits give you the right to extract water from the
6 ground in various locations?

7 A. That is correct.

8 Q. And to do the actual extraction, you either
9 have to own the ground or own an easement to do the
10 extraction?

11 A. That is correct.

12 Q. And Avion has acquired those rights over the
13 course of time since its founding?

14 A. Correct.

15 Q. I understand that the state still has a role
16 in whether you can actually extract that water by its
17 approval of the permit?

18 MR. STERINGER: I'll object to the form.

19 THE WITNESS: Well, you still have to report
20 use. There are -- is the 7J condition on any water
21 right after 1995, stuff like that.

22 BY MR. WILKER:

23 Q. So what's the 7J condition?

24 A. If the department feels there is a water
25 crisis, they're allowed to make changes to your permit

1 or certificate.

2 Q. And that only applies to permits issued
3 after 1995?

4 A. I believe so.

5 Q. And how much -- how much of your water
6 resource at Avion is based on permits issued after
7 1995 as opposed to -- as opposed to prior to 1995?

8 A. About half?

9 Q. So does that mean that in the event of a
10 water shortage declared by the state, does that mean
11 that for that half of the water resource that's post
12 1995, or approximately, that in the event of a water
13 shortage, the City could -- the State could modify
14 your permit and limit the amount of water you can buy?

15 A. That is my understanding.

16 Q. And does the permit give you a right to pump
17 a particular volume of water each year or each month
18 or each day, how does it work?

19 A. One does. The others are rate only, not
20 rate and duty, just rate.

21 Q. What does that mean?

22 A. If you are -- if you have a water right
23 permit, it will allow you to pump a thousand gallons a
24 minute or, you know, one CFS, whatever you want to
25 call it.

1 A. Avion does not determine the rates. The
2 Public Utility Commission determines the rates.

3 Q. So those rates are still subject to PUC
4 regulation?

5 A. Yes.

6 Q. And are they subject to regulation by any
7 other governmental entity apart from the PUC?

8 MR. STERINGER: I'll object to the form.

9 THE WITNESS: I mean, in a broader sense
10 OWRD and DEQ and health division just because water --
11 testing for water quality, water use reporting, that
12 type of thing.

13 BY MR. WILKER:

14 Q. And if there's no franchise agreement in
15 place for those localities, how does Avion go about
16 obtaining customers?

17 A. If you build a house in Avion water services
18 territory, you have to use Avion water or drill your
19 own well.

20 Q. And how do you determine that that's Avion
21 services territory if there's no franchise agreement?

22 A. Because it's on file at the PUC.

23 Q. So you designated territories at the PUC for
24 which you will provide water service?

25 A. Yes, and -- but that does not -- that also

1 does not prevent us from serving water anywhere else
2 as well.

3 Q. And does it -- does it prevent others from
4 service -- providing water within your service
5 territory?

6 A. It's our service territory.

7 Q. Okay. And so does the PUC in some sense
8 approve your exclusive service territory?

9 A. Yes.

10 Q. And that's part of the PUC process?

11 A. Yes.

12 Q. And that's distinct from the process that
13 you have with the city of Bend and their franchise
14 agreement?

15 A. They are totally separate.

16 Q. Does the PUC also have to approve your
17 exclusive territory with the city of Bend?

18 A. Yes. The map that we submitted to the PUC
19 has what we believe -- what we think of as our service
20 territory, and it is -- we didn't -- it just, it shows
21 the blue blob that you saw; so it includes stuff in
22 the city and the city of Redmond, too.

23 Q. Do you have a franchise agreement with the
24 city of Redmond?

25 A. No.

1 Q. Are there competing water service providers
2 in the city of Redmond?

3 A. Not that I'm aware of.

4 Q. Does the city of Redmond provide its -- have
5 its own water service provision?

6 A. Yes.

7 Q. So like the city of Bend, city of Redmond
8 also has a water utility function.

9 A. Correct.

10 Q. To your knowledge, has Avion always been
11 regulated by the Public Utility Commission?

12 A. Yes. But it started in '68 so there may be
13 some period that I'm not aware of.

14 Q. From the period that you are aware of, would
15 that -- would that run from when your father purchased
16 the company in 1987?

17 A. I believe they were regulated in the
18 eighties, but I can't be completely confident of that.

19 Q. Has the city of Bend ever notified Avion of
20 its intent to service customers in Avion's service
21 area?

22 A. No.

23 Q. Has Avion ever refused to service customers
24 in its service area?

25 A. No.

1 Q. Is the exclusive right to provide water
2 services important to Avion?

3 MR. STERINGER: I'll object to the form.

4 THE WITNESS: Yes, like, kind of. It's sort
5 of a nuanced question. Number one, if you wanted to
6 set up in our service territory, you would have to get
7 the water rights, drill the wells, build the
8 reservoirs, and build the piping.

9 So, yeah, it's important, but in the grand
10 scheme of things, it's very unlikely that anyone's
11 ever going to come set up shop, but they can, and
12 individual customers can drill their own wells.

13 BY MR. WILKER:

14 Q. Pretty price prohibitive for an individual
15 customer to drill its own well or their own well?

16 A. Depends on location, but in general, I would
17 assume, yes.

18 Q. In the statute, current version in Section
19 3, the grant of authority includes the right and
20 privilege to construct, erect, operate and maintain
21 its facilities in, upon, along, across, above, over
22 and under the streets, alleys, and public ways now
23 laid out or dedicated, and all extensions thereof and
24 additions thereto to the provision of water services
25 in the City. Does Avion avail itself of that

1 privilege?

2 A. Do we install waterlines in city streets?

3 Q. Yes.

4 A. Yes.

5 Q. And does Avion have to pay for that
6 privilege?

7 A. For new construction, we have to get permits
8 and we pay the franchise fee; so I'm going to say yes.

9 Q. Do you have to pay for the property rights
10 to -- for the rights of way?

11 A. It doesn't really -- that's not -- no. We
12 have to pay for the permit, we have to pay to put the
13 road back. If the City wants to put something there,
14 we have to pay to move our facilities out of their way
15 at their schedule.

16 But other than that, we pay the franchise
17 fee for the Franchise agreement, which gives us the
18 use of the City's rights of way.

19 Q. And does -- and when a new development's
20 going in, are those expenses -- expenses incurred by
21 Avion or typically by the developer?

22 A. Developer.

23 Q. And so presumably it fades into the prices
24 of the new homes that are -- or facilities that are
25 being developed?

1 how far this is going.

2 THE WITNESS: Avion already has first right
3 of refusal for the sale of Roats Water Company; so I
4 am fairly unconcerned with their franchise status.
5 And if you've talked to Bill Roats once, you'll never
6 want to talk to him again.

7 BY MR. WILKER:

8 Q. I think we talked a little bit briefly about
9 the Juniper service area earlier?

10 A. Juniper Ridge.

11 Q. Juniper Ridge. Does Avion service those
12 customers presently?

13 A. There are currently, I believe, two
14 customers in Juniper Ridge, and Avion does not serve
15 them.

16 Q. Is that because Avion swapped the -- the
17 service areas?

18 A. Yes.

19 Q. Are you familiar with the agreement with the
20 city of Bend for the municipal airport?

21 A. Yes.

22 Q. Were you involved in negotiating that
23 agreement?

24 A. Yes.

25 Q. Has that agreement been fully executed?

1 A. I believe so.

2 Q. To your understanding, is that agreement
3 being performed by the parties?

4 A. Yes.

5 Q. Mr. Bailey testified that at least it was
6 his understanding that -- that the price agreement in
7 that provision was built off a discount from the
8 tariff rate and would be made reciprocal if needed.
9 Is that accurate?

10 A. I believe so.

11 Q. But that it hasn't been needed to be
12 reciprocal because Avion's had no reason to purchase
13 water from the city of Bend; is that accurate?

14 A. That is correct.

15 Q. You testified earlier that you thought the
16 city of Bend wanted to do away with the requirement
17 that it charge the City the same franchise fee that it
18 charges -- that it charges Avion, correct?

19 A. Correct.

20 Q. And I just want to make sure I understand
21 correctly. If the City were to charge itself that
22 fee, then it would pass that -- that along to the
23 customer; is that the notion?

24 A. That's my belief.

25 Q. So when you set rates, you included the cost

1 of the franchise fee as one of your costs in setting
2 the rate with the rate tariff for PUC?

3 A. As far as I understand it, it's a
4 pass-through.

5 Q. And if the City weren't required to use --
6 to pay the same fee to itself, it would -- it would
7 have a price advantage for developers?

8 A. In theory, but I don't know for sure.

9 Q. Do you know what the City does with the
10 franchise fees that are paid to it?

11 A. I do not.

12 Q. Have you had any discussions with the City
13 about the use of those monies?

14 A. No.

15 Q. Apart from the right to the franchise, does
16 Avion get anything from the city of Bend for paying
17 that fee?

18 A. I don't believe so, but it does -- it allows
19 us to operate the business. I guess that's the main
20 thing is we get to have -- operate the utility in the
21 city, and that's about it as far as I understand.

22 Q. But in all of those other service areas that
23 you -- that you provide service for, you don't pay a
24 franchise fee, correct?

25 A. That is correct.

1 THE WITNESS: Is that the BPA transmission
2 easement? Oh.

3 (A Right of Way Dedication Deed was marked
4 as Exhibit 9 for identification.)

5 BY MR. WILKER:

6 Q. You've been handed Exhibit 9, which is a
7 document titled Right of Way Dedication Deed. Do you
8 know what this document concerns?

9 A. It concerns the construction of our new
10 office, and it required that we put a sidewalk outside
11 of it.

12 Q. Do you know why?

13 A. We had to put a sidewalk outside of it?

14 Q. Yes.

15 A. Because the City told us to, like any other
16 develop -- or someone who develops a piece of land in
17 the city, you have to conform to their plan; so this
18 construction project conformed to their plan.

19 (A Recorded Easement was marked as Exhibit
20 10 for identification.)

21 BY MR. WILKER:

22 Q. You've been handed Exhibit 10, which is an
23 easement or a recorded easement for what appears to be
24 a waterline easement. Do you recognize this document?

25 A. Yes.

1 Q. What is it?

2 A. The easement for the airport line.

3 Q. And what was the purpose of this easement?

4 A. The City wanted water, and it was the
5 shortest distance so it was the cheapest option.

6 Q. So the City provided an easement so that you
7 could provide a waterline to their facility from
8 wherever your main connection was?

9 A. Correct.

10 Q. And this was -- provision of this easement
11 allowed you, allowed Avion, to provide water to the
12 City that the City would then pay for?

13 A. It was our requirement so we would do the
14 project. We told them we needed an easement for our
15 waterline and so they provided it.

16 Q. And they needed the water, they needed the
17 waterline so they provided the easement?

18 A. I'm thinking they were more concerned about
19 fire flow because it's to the Bend airport and the
20 line does provide fire flow; so it's also a safety
21 issue.

22 (A Sunset View Estates and Avion Easement
23 was marked as Exhibit 11 for identification.)

24 BY MR. WILKER:

25 Q. Handing you what's been marked as Exhibit

1 11. Appears to be an easement with the Sunset View
2 Estates Homeowners Association, Inc. and Avion Water
3 Company. Are you familiar with this document?

4 A. No, but I know what it is.

5 Q. What is it?

6 A. It is a sanitary easement for a well.

7 Q. What is a sanitary easement for a well?

8 A. You are not allowed to have things like
9 sewers, drain fields, storm drains near a well in case
10 it goes down to the water table and pollutes the
11 water.

12 Q. And what's the purpose of the easement, like
13 what is -- what does the easement provide for Avion?

14 A. It prevents any type of item that's not
15 allowed by the health division to be installed in our
16 easement.

17 Q. So it restricts what the homeowners
18 association can do within that area?

19 A. Yeah. It's in Deschutes County, right?

20 Q. It's someplace in Deschutes County because
21 it's recorded.

22 A. Right, right. But that's true of any well,
23 whoever has -- if you have a well for your personal
24 house, you would have to have a hundred foot sanitary
25 easement.

1 Q. The piece of interest important in this is
2 if you look at the there -- "Now, therefore" language
3 towards the bottom of the first page, first page.

4 A. Oh, I'm sorry.

5 Q. There's a space and then it says Now,
6 therefore, in view of the premises and in
7 consideration of \$6500 future water credit by the
8 second party, which is Avion, to the first party, was
9 it common for Avion to pay in the form of credit for
10 an easement?

11 A. Yes.

12 Q. And so the -- why did Avion have to pay for
13 the easement if it was necessary to protect the
14 homeowners' well?

15 A. It was -- it's a new well; so to build
16 something new we need an easement, and the best way
17 for us to do it, quickest, fastest, easiest is water
18 credit.

19 Q. And was that a common way of paying for
20 easements for -- for Avion?

21 A. Yes.

22 Q. If I understood your testimony earlier
23 correctly, your service territory is approved by the
24 PUC?

25 A. Yes.

1 Q. And so if the urban growth boundary in -- in
2 and around Ben expands, does that change your service
3 territory at all?

4 A. No.

5 Q. If you -- if the urban growth boundary were
6 to grow into areas where you don't presently have
7 service, would you be able to expand into those areas?

8 MR. STERINGER: Object to the form.

9 THE WITNESS: That's a pretty vague
10 question, but, yeah. We -- we are allowed to serve
11 water wherever, we just have -- as long as we have the
12 water right, but our exclusive territory is our
13 exclusive territory. But if, for example, a
14 subdivision's built outside of it, we can serve it.
15 BY MR. WILKER:

16 Q. And if you wanted to expand your exclusive
17 territory, you'd have to get PUC approval to do that?

18 A. Yes.

19 Q. Fair to say that the population of Bend and
20 Central Oregon has grown exponentially over the last
21 several years?

22 A. Yes.

23 Q. And you are potentially servicing many more
24 households and consumers than you previously used to
25 service?

1 A. Yes.

2 (An Email Regarding McClellan and Summer
3 Shade was marked as Exhibit 12 for identification.)

4 BY MR. WILKER:

5 Q. I'm handing you what's been marked as
6 Exhibit 12. You'll see on one side of the page is a
7 email with an attachment titled or referencing an
8 attachment called Summer Shade McClellan
9 properties.doc, which appears to be -- and then
10 there's a letter on the second page. Are you familiar
11 with this?

12 A. Yep.

13 Q. What was -- what was being discussed in this
14 service area?

15 A. There were two lots that for some reason had
16 super long galvanized pipe services from the City's
17 service territory into Avion's service territory.

18 Most likely it happened when the land was
19 resubdivided, and the City wanted to get rid of those
20 two lines because they provided bad service and
21 galvanized pipe eventually goes bad because it builds
22 up scale, and it was in our service territory so we
23 took it over.

24 Q. And the City agreed to that?

25 A. They approached us.

Page 61

1 sewer main or have to cross them at a 90 degree angle
2 and so that's what drives most of the design is sewer.

3 But there's also high-pressure gas mains by
4 Cascade Natural, phone, cable, and fiber-optic that go
5 places, too, so sometimes you have to adjust.

6 Q. And is it fair to say that most of the work
7 in that process is new development?

8 A. Yes. The old stuff is pretty much whoever
9 was there first. Except, again, for sewer.

10 Q. Does the City ever require you to
11 essentially renovate or put in new waterlines where
12 existing waterlines may have aged or -- or become
13 degraded?

14 A. The City has no say in what we do with our
15 waterlines. We've had waterlines in the ground since
16 '68 that are still there, but they're PVC, not ductile
17 iron; so their lifespan is about 10,000 years.

18 Q. Forever chemicals not?

19 A. Chemicals, pipe.

20 MR. WILKER: Okay. Let's take a break, 10
21 minutes?

22 THE VIDEOGRAPHER: Stopping recording at
23 3:47.

24 (A recess was taken.)

25 THE VIDEOGRAPHER: We are recording and

1 again, we are continuing the recording on case number
2 22CV18513.

3 MR. WILKER: Just for the Record,
4 Ms. Zycherman has signed off for the evening; so she
5 is no longer with us.

6 BY MR. WILKER:

7 Q. If you have the Bend Code Water Service
8 Franchise provisions in front of you again, Exhibit 4,
9 or 7, either way.

10 My question is on Section 7, where it says
11 Company shall have authority to promulgate such
12 reasonable rules and regulations governing the conduct
13 of its business as shall be reasonably necessary to
14 enable Company to exercise its rights and perform its
15 obligations under this franchises, and to assure
16 uninterrupted service to its customers. Company rules
17 and regulations shall be subject to the provisions of
18 this ordinance and any other governmental regulations.
19 A copy of said rules and all amendments thereto should
20 be filed with the Office of City Manager. Do you see
21 that provision?

22 A. Uh-huh.

23 Q. Is that a yes?

24 A. Yes.

25 Q. Does Avion have company rules and

1 regulations?

2 A. Yes.

3 Q. Have they been filed with the office of the
4 city manager?

5 A. I have no idea.

6 Q. Do you know where they are retained --

7 A. No.

8 Q. -- at Avion?

9 A. Rick has them somewhere.

10 Q. How are such rules adopted at Avion?

11 A. You mean corporate rules or policies or --

12 Q. Any -- any company rule that would be
13 subject to Section 7 of this franchise agreement.

14 A. In general, I don't know that it's that
15 structured. We have an employee manual with our
16 company rules. As far as corporate rules, I believe
17 we just conform to the state of Oregon.

18 Q. And do you have other rules, any company
19 rules for how you address customer complaints?

20 A. PUC rules. PUC governs the customer
21 interaction.

22 Q. And you don't know whether or not a copy of
23 the rules and all amendments thereto have been filed
24 with the office of the city manager?

25 A. I do not.

1 A. Oregon Health Division.

2 Q. OHD, thank you.

3 A. Sorry.

4 Q. Does Avion, is Avion required to submit
5 water quality reports to the city of Bend?

6 A. No.

7 Q. Is Avion required to submit water quality
8 reports to the PUC?

9 A. No.

10 Q. Is Avion required to submit water quality
11 reports to the Oregon health department --

12 A. Yes.

13 Q. -- or Oregon Health Authority, excuse me.

14 A. Yes.

15 Q. And also the Oregon Water Resources
16 Department or no?

17 A. I don't think so, just use.

18 Q. Is Avion required to submit water quality
19 reports to the EPA?

20 A. That is the Oregon Health Authority.
21 Oregon's a primacy state where the Oregon Health
22 Authority enforces the EPA regulations so same thing.

23 Q. Does Avion publish its water quality reports
24 for customers?

25 A. As required, we do, yearly.

1 says as opposed to what is actually reasonable and
2 effective conservation measures. Political window
3 dressing versus actual, and they are very -- two very
4 different things.

5 Q. Is there anyone else at the City that you
6 deal with that you have a better working relationship
7 than Mr. Buettner?

8 A. I like Eric King, he's awesome, but we don't
9 have -- our paths don't cross ever so other than
10 charity stuff for, like, the KIDS Center.

11 Q. And what's Mr. Buettner's role?

12 A. I don't know. He's -- he used to be -- I
13 think he's utility director, but he's not even an
14 engineer so as the previous utility directors were
15 engineers, and I think it shows that this gentleman
16 came from billing. Sorry.

17 (An Email dated January 29, 2014 Regarding
18 ADU's was marked as Exhibit 16 for identification.)

19 BY MR. WILKER:

20 Q. You've been handed what will be marked as
21 Exhibit 16, which is a document numbered AWC000217 to
22 218. 217 appears to be an email attaching the letter
23 that's shown in 218.

24 A. Okay.

25 Q. Do you see that?

1 A. Yeah.

2 Q. Okay. Do you recall a discussion with
3 representatives of the city of Bend regarding ADU's?

4 A. Vaguely.

5 Q. What do you recall about it?

6 A. That we require a separate meter for an ADU
7 and the City does not.

8 Q. And why is that?

9 A. I don't know.

10 Q. Why is it that Avion requires a separate
11 meter?

12 A. Avion requires a second meter because
13 oftentimes ADU's are rented out, and it prevents us
14 having to deal with ADU people who've had their water
15 shut off by a homeowner who hasn't paid their bill.

16 Because you have two residences, a renter,
17 homeowner. Homeowner doesn't pay, gets shut off.
18 That means, if you only have one meter, the ADU is
19 shut off, too, even though this guy's paid and so to
20 avoid that type of conflict, we require a second meter
21 for the ADU.

22 Q. And was -- was Avion empowered to have that
23 as a requirement?

24 A. Yes.

25 Q. Does that require the City's approval in any

1 measure?

2 A. No.

3 Q. Did that require approval from the PUC in
4 any measure?

5 A. I don't recall.

6 Q. Has the city of Bend changed its policy or
7 does it still only require a single meter?

8 A. I don't know. I think it's still one meter,
9 but I don't know for sure.

10 Q. What did you mean that Avion requests that
11 the City require a ADU applicant to have a "willing
12 and able to serve" letter from Avion prior to
13 acceptance?

14 A. That means if you come into the city of Bend
15 with a building permit in Avion service territory to
16 build an ADU, you have to get a willing and able to
17 serve, which is essentially our approval of the ADU.

18 It basically puts us in the chain of
19 notification so we get notified when someone's
20 building an ADU and that they have to meet our
21 requirements, not the City's.

22 Q. And did the City make that part of its
23 requirement?

24 A. Uh-huh.

25 Q. That's a yes?

1 A. Yes. Sorry.

2 (An Email dated January 4, 2022 Regarding
3 Conflict Resolution was marked as Exhibit 17 for
4 identification.)

5 BY MR. WILKER:

6 Q. You've been handed Exhibit 17, which is a --
7 an email dated January 4, 2022 from you to Michael
8 Buettner and others with the Bates number AWC002576.
9 Are you familiar with this document?

10 A. Oh, yeah.

11 Q. To what is the reference, this the first
12 item says I've not heard of any proposed settlements
13 to: One, the City taking Avion service territory or
14 the for such taking?

15 A. Yes.

16 Q. To what were you referring?

17 A. The City ended up serving three lots in
18 Avion's service territory, and I'm trying to make them
19 pay for it, and I want them to propose a solution
20 because having them propose it is better than -- just
21 to see what they come up with.

22 The fire connection on 27th and Bear Creek
23 was done at the request of a previous administration
24 in the nineties, and it was always with the caveat
25 that Avion could have a fire flow connection if we so

Page 81

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

C E R T I F I C A T E

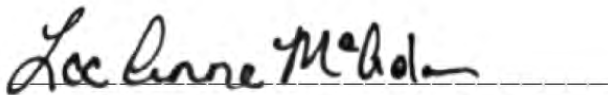
STATE OF OREGON

I, LEE ANNE McADAM, RMR, do hereby certify that pursuant to the Rules of Civil Procedure, the deposition of JASON WICK was by me reduced to machine shorthand, afterwards transcribed by me by means of computer, and that to the best of my ability the foregoing is a true and correct transcript of the deposition so given as aforesaid.

I further certify that this deposition was taken at the time and place specified in the foregoing caption.

I further certify that I am not a relative, counsel or attorney for either party, or otherwise interested in the outcome of this action.

IN WITNESS WHEREOF, I have hereunto set my hand at Bend, Oregon on the 6th day of July, 2023.



LEE ANNE McADAM, RMR
NOTARY PUBLIC

My Commission expires November 21, 2026.
Notary Registration Number 1030903.

AVION WATER COMPANY, INC.

Quality Water on Tap in Central Oregon

2021 Draft Water Management and Conservation Plan

1. Municipal Water Supplier Plan Elements (OAR 690-086-125)

Introduction

Avion Water Company, Inc. (Avion) is a fully regulated Class A Water Utility Company. Avion provides water to over 32,000 customers in Central Oregon. The Greater Avion Water System (GAWS) includes both lands within and outside the City of Bend Urban Growth Boundary (UGB) and comprises approximately 90 percent of Avion’s service connections and demand. Avion also operates several ‘satellite’ water systems, which are generally small, independent water systems Avion has acquired over a number of years, in some cases due to the inability of the former owner to continue to meet minimum legal requirements for operation of the water system.

The Oregon Public Utility Commission (PUC) regulates all of the prices, which Avion charges its customers for all services and the quality of service Avion provides to its customers. The PUC estimates that there are approximately 3,500 water utilities in Oregon, of which 33 are fully rate regulated in the same manner as Avion.

The rate structure imposed by the PUC assumes that approximately 60 percent of Avion revenue will be generated from its allowed "base" charge and 40 percent from commodity sales. This incentivizes Avion customers to conserve water. It is essential for Avion to remain profitable in order to finance continued required improvements, repay existing capital debt, and to continue to provide quality service to its customers.

A comparison of Avion’s rates to other water utilities in the area is shown below in Table 1.1.

Table 1.1. Comparison of historical water rates for Central Oregon Water Providers.

	Commodity cost (\$/ccf)			
	Redmond	Bend	Roats	Avion
2003	\$0.81	\$0.87	\$0.72	\$0.80
2010	\$1.02	\$1.29	\$0.76	\$0.82
2020	\$1.27	\$1.96	\$0.95	\$0.99

Plan Requirement

This Water Management and Conservation Plan (WMCP or Plan) fulfills the requirements of Oregon Administrative Rules (OAR) Chapter 690, Division 86, effective as of December 2018. Avion completed its first WMCP in 2004. Avion submitted an updated WMCP in 2011. OWRD issued a final order approving Avion’s current WMCP on September 13, 2011. Consistent with that order, Avion also submitted a WMCP Progress Report in 2016 describing Avion’s water use and progress on water conservation measures. The 2011 order required Avion to submit an updated WMCP by March 2021.

Additionally, Avion is submitting this WMCP consistent with the final order extending the development deadline for groundwater Permit G-18474, dated October 7, 2022. Through this WMCP, Avion is also seeking access to the undeveloped portions of extended Permits G-16025 (permit extension final order March 25, 2011) and G-17539 (permit extension final order March 25, 2011). Finally, Avion is submitting this WMCP in order to fulfill a condition of Permit G-18198 for use of water at Squaw Creek Canyon Estates (SCCE) requiring submittal of a WMCP within three years of permit issuance or before use of the second increment of water development occurs, whichever is sooner. Avion will also require new water rights for the use of water at SCCE and the GAWS within the next ten years.

Affected Local Governments

The following governmental agencies may be affected by this WMCP:

- Deschutes County
- Crook County
- City of Bend
- City of Redmond

Avion provided each of these local governments with a copy of the WMCP for review on September 3, 2021. All email correspondence is included in Appendix C.

Plan Update Schedule

Avion anticipates submitting an update of this Plan within 10 years of the final order approving this Plan. As required by OAR Chapter 690, Division 86, a progress report will be submitted within 5 years of the final order.

Time Extension

Avion is not requesting an extension of time to implement metering or a benchmark established in a previously approved plan.

2. 690-086-140 Municipal Water Supplier Description

The water supplier description element shall include at least the following information:

1) Source(s) of water; including diversion, storage, and regulation facilities; exchange agreements; intergovernmental cooperation agreements, and water supply or delivery contracts;

1.a Source Water

Avion's sole source of water for the GAWS and for all satellite water systems is groundwater pumped from the Deschutes basalt aquifer. The GAWS includes 11 wells with production capacities ranging from 600 to over 2000 gallons per minute (gpm). The water quality of the GAWS wells is exceptional and no chemical treatment is required prior to distribution. In 1989, Avion made significant investments in its production facilities and distribution system in order to convert to a gravity flow system. This significantly reduced power demand for booster pumps within the water system.

There are an additional 25 wells that serve the satellite water systems, generally with lower capacities of 25 to 350 gpm.

Avion's measurements show that water levels in the GAWS wells and Avion's satellite system wells are generally stable. The Deschutes aquifer fluctuates in response to climate cycles, but there is no long-term trend.

1.b Water System, Storage Facilities, Regulation Facilities, & Diversions;

Greater Avion

The GAWS includes approximately 310 miles of main lines, most of which are PVC construction and of various diameters up to 24 inches. The GAWS wells are entirely interconnected, allowing for maximum flexibility in water delivery and protection against shortages caused by pump or individual well failures.

There are seven existing reservoirs with a total storage capacity of nearly 12.4 million gallons. This would provide adequate stored water supplies to meet the peak-day system demand for 16 hours. In the event of an extended system-wide power loss, the existing storage would provide water for meeting basic household and health and safety needs for up to 5 days, provided Avion required its customers to eliminate all non-essential water use, including irrigation. Section 4 further discusses the restrictions that would be placed on all non-essential uses in the event of such a catastrophe.

The present GAWS is schematically displayed in Appendix A. The maps show the locations of all current and proposed pipelines, wells, reservoirs, and pump stations along with other relevant information.

The GAWS currently has six groundwater pumping stations (Table 2.1) that consist of 11 high production wells. Additional wells are at the ready to serve as backup sources of supply, to come on line as the rapid increases in system demand dictate, or if a primary supply well goes down. In addition, there are eight "reserve" wells that could be prepared for use should the need arise. The 11 production wells have a pumping capacity of about 29.18 cfs (14,687 gpm).

Table 2.1. Greater Avion Water System well capacities.

<u>Well Site</u>	<u>Location</u>	<u>Capacity (GPM)</u>	<u># of Wells</u>
1	Tekampe (A, B, & C wells)	2630	3
2	Parrell Road	1290	1
3	Riverbend (Wells 1 & 2)	1969	2
5	China Hat (Wells 1, 2, &3)	4902	3
6	Dyer Site	2077	1
8	Deschutes River Woods	<u>1999</u>	<u>1</u>
<u>Totals</u>		<u>14,867</u>	<u>11</u>

Satellite Systems

In addition to the GAWS, Avion is the operator of 16 satellite systems; in most cases, Avion owns the satellite system and is the owner/holder of the water right. Although Avion is the operator for the Brasada system, Avion is not the owner or water right holder, Brasada submits its own WMCPs. Pumping under Brasada’s water right, and Brasada’s water sales have been excluded from reporting in this WMCP. Table 2.2 shows the well capacities for all the satellite systems. Additional analyses below only include the satellite systems where Avion is the water right holder.

1.c Exchange agreements; Intergovernmental Cooperation Agreements, & Water Supply or Delivery Contracts;

Avion has a franchise agreement that has defined service territories with the City of Bend along with several interties for emergency delivery of water to the City. Avion also maintains an interconnection with Roats Water Company (Roats) under a joint venture agreement. Roats Well 10 pumps into the GAWS and is used primarily to meet peak season demands. Avion delivers water to Roats year-round through Avion’s mains to interconnections on Parrel Road and Brookwood Boulevard at a wheeling fee of \$0.04 per 100 cubic feet (cu ft).

2. A delineation of the current service areas and an estimate of the population served and a description of the methodology(ies) used to make the estimate;

2.a. A delineation of the current service area;

The GAWS current service area and satellite service areas are shown in Appendix A

2.b. An estimate of the population served and a description of the methodology(ies) used to make the estimate;

In 2020, Avion serviced 12,990 connections in the GAWS service area. The population served is estimated to be 32,345 based on an estimate of 2.49 people per household, consistent with U.S. Census Bureau data from 2015 through 2019 for Deschutes County. Avion’s satellite water systems have a combined estimated 1,214 service connections, equating to an estimated population of 3,023. The total service population, including satellite systems, is estimated to be 35,368.

Table 2.2: Avion satellite water system well capacities.

Water System	Well Name	Capacity (gpm)
Cinder Butte	CINDER BUTTE WELL 1 (DESC 2446)	100
	CINDER BUTTE WELL 2 (DESC 307 & 58435)	175
Red Cloud	POWELL BUTTE WELL 1 (CROO 51975 & 53534/L-58239)	500
	POWELL BUTTE WELL 2 (CROO 54458/L-124144)	500
Wild River	WILD RIVER SOUTH (DESC 6503)	100
	WILD RIVER NORTH (DESC 6504)	120
Odin Falls	ODIN FALLS (DESC 2123)	100
Tetherow Crossing	TETHEROW CROSSING / ZAMIA (DESC 2201)	60
Tuscarora	DRW TUSCARORA (DESC 5482)	100
Chaparral	CHAPARRAL WELL 1 / MESA (DESC 4006 & 53381)	100
	CHAPARRAL WELL 3 / MIDDLE (DESC 56939)	250
	CHAPARRAL WELL 4 / SOUTH (DESC 3673)	250
Tumalo Rim	TUMALO RIM WELL 1 (DESC 4775)	3
	TUMALO RIM WELL 2 (DESC 4774)	58
Powell Butte View Estates	PBVE-BRASADA WELL (CROO 50194/L-2184)	75
Tetherow Crossing	TETHEROW CROSSING 52ND STR (DESC 2199)	113
Highland Estates	HIGHLAND WELL 1 (DESC 4492)	39
Deschutes River Ranch	DESCHUTES R RANCH WELL (DESC 54655/L-56215)	47
Desert Springs	DESERT SPRINGS WELL (DESC 5107) (GW HAS DESC 58007/L-84181)	99
South Redmond Heights	S REDMOND HEIGHTS (DESC 3978)	10
Happy Acres	HAPPY ACRES WELL (DESC 4382)	10
SCCE	SCCE WELL 1 (DESC 58167/L91141)	50
	SCCE WELL 2 (DESC 58039/L42966)	50
	SCCE WELL 3 (DESC 59678/L42967)	300

3. An assessment of the adequacy and reliability of the existing water supply considering potential limitations on continued or expanded use under existing water rights resulting from existing and potential future restrictions on the community’s water supply;

As mentioned in the introduction above, Avion relies upon a single water source, the area's regional basalt aquifer. All wells develop water from this source. Water level measurements have been taken periodically since Avion began, and a more systematic and regular measurement program has been in place for the past several years. Several of the satellite systems that surround the main system have shown a slight decline in the water table, which has been preliminarily attributed to the lining and piping of nearby irrigation canals. Other than that, there have been no significant groundwater level declines in the Avion wells.

The US Geological Survey, in cooperation with OWRD and other state, federal, and local agencies has conducted a comprehensive groundwater study in the Upper Deschutes Basin, an update to that report, and a model of the groundwater and surface water published in 2017. Further data was reported

regarding the average annual recharge occurring to this groundwater flow system. It is now estimated that, averaged over the entire year, over 4,000 cubic feet per second (cfs) of water is recharged. About 3,500 cfs of this is from natural infiltration of precipitation, and about 500 cfs is from canal leakage (pre-lining) and on-farm losses, primarily from irrigation district water application throughout the area. Preliminary data also shows that the groundwater flow system discharges to the Deschutes River far downstream from the City of Bend.

There is no present indication of the development of any future physical water supply problems from this source. However, there are administrative and statutory limitations on access to groundwater in the Upper Deschutes Basin. There is a 200 cfs cap on new groundwater permits that has been established by OWRD. Avion plans to apply for a new water right permit for the GAWS in order to keep up with the pace of growth within the City of Bend UGB. However, there is currently less than 15 cfs available under the 200 cfs cap. If the cap is reached and a new groundwater permit cannot be issued, Avion will be forced to halt the addition of new construction in Avion’s service territory or purchase existing groundwater permits and/or water rights, if any are available.

In addition to the limitations imposed by the 200 cfs cap, Avion is required to provide mitigation credits for all water use under four of its existing permits, and for any new water rights. There are very few permanent mitigation credits available, and what is available is generally expensive and obtained through one-off deals with high transaction costs. The scarcity of mitigation credits has not posed a problem for Avion yet, but will in the near future if there continue to be so few sellers in the mitigation credit market.

4. A quantification of the water delivered by the water supplier that identifies current and available historic average annual water use, peak seasonal use, and average peak day use;

Avion’s water demands consist of the volume of water pumped from the Deschutes aquifer, plus the amount of water supplied by Roats’ Hole Ten well, less the amount of water Avion provides to Roats. A summary of water demands for the GAWS and Avion’s satellite water systems is shown in table 2.3.

Table 2.3: Avion water demand summary.

Water Year	Annual (MG)			ADD (MG)		MMD (MG)		MDD (Greater Avion Only)	MDD Date	Greater Avion Peaking Factor MDD:ADD
	Greater Avion	Satellite Water Systems	Grand Total Avion	Greater Avion	Satellite Water Systems	Greater Avion	Satellite Water Systems			
2016	2545	188	2733	6.97	0.5	417.3	24.6	16.14	7/29	2.31
2017	2681	201	2882	7.35	0.6	501.6	23.4	18.62	8/2	2.53
2018	2707	220	2927	7.42	0.6	485.2	29.1	19.14	7/16	2.58
2019	2468	239	2707	6.76	0.7	418.9	34.8	17.79	8/4	2.63
2020	2616	237	2854	7.17	0.6	467.6	32.2	18.02	7/22	2.51

Note: subtotals may not sum to total due to rounding.

MG = million gallons

ADD = average day demand

MDD = maximum day demand

Avion’s future demand projections for the GAWS are based on Avion’s maximum operational demands, which are equal to the maximum 4-hour rolling average demand. In 2020, Avion’s maximum operational demand for the GAWS was 36.6 cubic feet per second, equivalent to 23.7 million gallons per day (mgd).

5. A tabular list of water rights held by the municipal water supplier.

Table 2.4 shows a complete listing of Avion's existing water rights and related information. Avion began acquiring water rights in its own name on May 21, 1969. As of today, there are 19 separate rights that Avion holds and uses (one is used through agreement) for the GAWS.

Transfer T-13353 (permit G-12788) allows for a total maximum appropriation of 25.19 cfs (11,305 gpm) from 14 wells for quasi-municipal use throughout the GAWS. The maximum authorized rate under transfer T-13353 is limited to 11,305 gpm *together with prior rights for the same wells*. The prior water rights Avion held at the time of issuance of Permit G-12788 are denoted in table 2.4.

In addition to the rate authorized by T-13353, Avion also holds Permits G-17539, G-16025, and G-18474 for the use of water within the GAWS and satellite systems. All three permits require mitigation under the Deschutes Basin Groundwater Mitigation Program and approved incremental mitigation plans are on file with OWRD.

Avion has an agreement with Gold Ring Holdings, LLC to use the full 2.7 cfs rate of Certificate 93055 between 5 AM and 5 PM from May 25th through September 5th at China Hat Well 3. This agreement is the basis for temporary transfer T-13140.

(a) Application, permit, transfer, and certificate numbers (as applicable);

Table 2.4 shows water rights for the GAWS and Avion's satellite water systems.

(b) Priority date(s);

See Table 2.4

(c) Source(s) of water;

The source of water for all permits is the Upper Deschutes Basin Aquifer.

(d) Types of beneficial uses specified in the right;

See Table 2.4.

(e) Maximum instantaneous and annual quantity of water allowed under each right;

See Table 2.4

(f) Maximum instantaneous and annual quantity of water diverted under each right to date;

See Table 2.4

(g) Average monthly and daily diversions under each right for the previous year, and if available for the previous five years;

See Table 2.4.

(h) Currently authorized date for completion of development under each right; and

See Table 2.4

(i) Identification of any streamflow-dependent species listed by a state or federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in a critical groundwater area.

There are currently no known species threatened or otherwise endangered in Avion's water source. The water source is not listed as water quality limited. There is no designation of the source as being in a critical ground water area or groundwater limited area.

Table 2.4 Avion Water Rights Table. **Denotes groundwater rights jointly limited to 25.19 cfs in combination with transfer T-13353.

Application Number	Permit Number	Certificate or Transfer Number	Priority Date	Authorized Use	Authorized Rate of Diversion (cfs)	Authorized Sources	Well-specific Authorized Rate of Diversion (cfs)	Authorized Annual Volume (AF)	Development Date	Maximum Rate of Withdrawal to Date (cfs)	Notes or Limitations to Water Use (Common Names)	2020 Average Withdrawal Monthly (MG)	2020 Average Withdrawal Daily (MG)	Five-Year Average Withdrawal Monthly (MG)	Five-Year Average Withdrawal Daily (MG)
<i>GAWS Groundwater Rights and Other Water Rights Jointly Limited to 25.2 cfs with Inchoate Transfer T-13353</i>															
G-12924	G-12788	84975 T-13353	12/4/1992 5/18/1992	Quasi-municipal	24.98 0.21	Dyer 1 Parrell Road Riverbend 1 Riverbend 2 Riverbend 3 Tekampe 1 Tekampe 2 Tekampe 3 China Hat 1 China Hat 2 China Hat 3 Deschutes River Woods Conestoga Sundance 2	-	-	10/1/2025	25.2	The quantity of water used under this water right, together with any prior right for the same wells, shall not exceed the maximum rate allowed by this right.				
G-16060	G-17539	-	7/8/2003	Quasi-municipal	10.0	Deschutes River Ranch Dyer 1 Desert Springs Parrell Road Riverbend 1 Riverbend 2 Riverbend 3 Tekampe 1 Tekampe 3 China Hat 1 China Hat 2 Deschutes River Woods Conestoga Sundance 2	-	1287.0	10/1/2025	10.0	Annual volume limited by amount of mitigation provided. <i>Modified by T-10204, T-10488 and T-12027</i>				
G-15851	G-16025	-	10/9/2002	Quasi-municipal	5.0	Morningstar Parrell China Hat 1 China Hat 2	-	643.0	10/1/2025	5.0	Annual volume limited by amount of mitigation provided. Limited to April 15 through October 15. <i>Modified by T-10204, T-10488, and T-10488</i>				
G-17606	G-18474	-	12/14/2012	Quasi-municipal	10.0	China Hat 3 Brown 1 Brown 2 Dyer 2	-	1287.0	10/1/2040	3.97	Annual volume limited by amount of mitigation provided. <i>Modified by T-13352</i>				
G-12033	G-11091	93055	2/22/1990	Quasi-municipal	2.7	Well 1 China Hat 1	-	-	N/A	2.70	Used during periods of peak demand under terms of agreement with certificate holder. <i>Authorized by temporary Transfer T-13140.</i>				
G-10184	G-9946	82418 T-10205	2/27/1981 11/12/1981	Quasi-municipal	3.55** 0.67**	Boonseborough-McGrath 2 Riverbend 1 Riverbend 2 Parrell Road China Hat 1 China Hat 2 Tekampe 1 Tekampe 2 Tekampe 3 Sundance 2 Conestoga Deschutes River Woods	-	-	10/1/2027	4.22					
G-10421	G-9948	82419 T-10205	7/2/1981	Quasi-municipal	2.5**					2.50					
G-10378	G-9975	82420 T-10205	6/16/1981	Quasi-municipal	2.15**					2.15					
G-10154	G-9217	82414 T-10205	2/11/1981	Quasi-municipal	1.11**					1.11					
G-10242	G-9269	82415 T-10205	4/1/1981	Quasi-municipal	0.32**					0.32					
G-10310	G-9320	82416 T-10205	5/11/1981	Quasi-municipal	0.04**					0.04					
G-10445	G-9976	82417 T-10205	7/13/1981	Quasi-municipal	0.03**					0.03					

Application Number	Permit Number	Certificate or Transfer Number	Priority Date	Authorized Use	Authorized Rate of Diversion (cfs)	Authorized Sources	Well-specific Authorized Rate of Diversion (cfs)	Authorized Annual Volume (AF)	Development Date	Maximum Rate of Withdrawal to Date (cfs)	Notes or Limitations to Water Use (Common Names)	2020 Average Withdrawal Monthly (MG)	2020 Average Withdrawal Daily (MG)	Five-Year Average Withdrawal Monthly (MG)	Five-Year Average Withdrawal Daily (MG)
G-10348	G-9971	-	5/29/1981	Group Domestic Supply for 151 Families Including Irrigation of Lawns and Gardens Not to Exceed One Half Acre in Area Per Family	0.48**	Well G-1	-	-	10/1/2022	0.43		220.2	7.3	217.2	7.1
						Well H-1									
						Well 1									
						Well 2; Glacier View									
						Well 3; Pohaku Ranch									
						Well:1									
						Well:2									
						Well A									
						Well F-1									
						Well F-2									
						Well D-1									
						Well D-2									
						Well D-3									
						Well T									
						Well V									
						Well N-1; Sundance Well 2									
						Well N-2; Sundance Well 2									
						Well Q									
						Well W									
						Tuscarora Well									
						Cody Road Well									
						Well A-2									
						Well R; Conestoga									
						Well O									
						Well P									
						Well 1; Whispering Pines									
						Well B-2; Riverbend Well 2									
						Well C-1; Tekampe 1									
						Well C-2; Tekampe 2									
						Well C-3; Tekampe 3									
						Well A-1									
						Well B-1									
						Well B-2									
Well C-1															
Well E-1															
Well 2															
Well 3															
Well 4															
Well 5; Riverbend 1															
Well-1															
Well-2															
Well-3															
Well B															
Well C															
Well D															
Well E															
Well F															
Well G															
Well E-2															
Well G-2															
Well H-2															
Well I															
Well J															
Well L															
Well M															
Well U															
Well X															
Well Y															
Well Z-1; Boonsborough-Mcgrath Well 1															
Well Z-2; Boonsborough-Mcgrath Well 2															
China Hat Well															
Parrell Road Well															
Well S															

Application Number	Permit Number	Certificate or Transfer Number	Priority Date	Authorized Use	Authorized Rate of Diversion (cfs)	Authorized Sources	Well-specific Authorized Rate of Diversion (cfs)	Authorized Annual Volume (AF)	Development Date	Maximum Rate of Withdrawal to Date (cfs)	Notes or Limitations to Water Use (Common Names)	2020 Average Withdrawal Monthly (MG)	2020 Average Withdrawal Daily (MG)	Five-Year Average Withdrawal Monthly (MG)	Five-Year Average Withdrawal Daily (MG)	
G-10599	G-9981	87382	11/19/1981	Group Domestic Supply for 53 Families Including Irrigation of Lawns and Gardens Not to Exceed One Half Acre in Area Per Family	0.18**	Parrell Road	-	-		0.18						
						Riverbend 1										
						Riverbend 2										
						Tekampe 1										
						Tekampe 2										
						Tekampe 3										
						China Hat 1										
						Gosney										
G-10440	G-10000	86161	7/10/1981	Group Domestic Supply for 281 Families Including Irrigation of Lawn and Garden Not to Exceed One-Half Acre for Each	0.56**	Tuscarora	-	-		0.56						
						China Hat 1										
						China Hat 2										
						Deschutes River Woods										
						Conestoga										
						Parrell Road										
						Riverbend 1										
						Riverbend 2										
						Riverbend 3										
						Tekampe 1										
						Tekampe 2										
						Tekampe 3										
G-10263	G-9341	91068	4/8/1981	Quasi-municipal	0.66**	Whispering Pines	0.22	-		0.66						
						Glacier View	0.22									
						Pohaku Ranch	0.22									
G-10208	G-16949	88551	3/11/1981	Quasi-municipal	0.37**	Dyer 1	-	-		0.37						
						Parrell Road										
						Riverbend 1										
						Riverbend 2										
						Riverbend 3										
						Tekampe 1										
						Tekampe 2										
						Tekampe 3										
						China Hat 1										
						China Hat 2										
						Deschutes River Woods										
						Gosney										
G-10347	G-11972	-	1/13/1983	Domestic Supplies for 151 Families Including Irrigation of Lawns and Gardens Not to	0.24**	Well 1 (Codyville)	0.12	-	10/1/2022	0.24						
						Well 2 (Codyville)	0.12									
G-11741	G-11389	93364	11/13/1987	Quasi-municipal	1.00**	Highland	0.065	-		1.00						
						Tumalo Rim 1	0.0067									
						Tumalo Rim 2	0.13									
						Tekampe 2	1.00									

Application Number	Permit Number	Certificate or Transfer Number	Priority Date	Authorized Use	Authorized Rate of Diversion (cfs)	Authorized Sources	Well-specific Authorized Rate of Diversion (cfs)	Authorized Annual Volume (AF)	Development Date	Maximum Rate of Withdrawal to Date (cfs)	Notes or Limitations to Water Use (Common Names)	2020 Average Withdrawal Monthly (MG)	2020 Average Withdrawal Daily (MG)	Five-Year Average Withdrawal Monthly (MG)	Five-Year Average Withdrawal Daily (MG)
Water Rights for Avion Satellite Systems, Not Available for GAWS Use															
G-8754	G-8258	84898	4/19/1978	Group Domestic for 37 Families	0.04	Tetherow 1		-		0.04	Tetherow.				
G-10371	G-9999	84899	6/11/1981	Group Domestic Supply for 80 Families Including Irrigation of Lawn and Garden Not to Exceed One-Half Acre for Each	0.27	Tetherow 1	0.18	-		0.27		1.22	0.04	1.43	0.05
						Tetherow 3	0.11								
G-10207	G-9283	-	3/11/1981	Quasi-municipal	0.58	Cinder Butte 1	0.33	-	10/1/2027	0.49	Cinder Butte	0.58	0.02	0.67	0.02
						Cinder Butte 2	0.33								
G-10617	G-9982	95993	12/29/1981	Group Domestic Supply for 28 Families Including Irrigation of Lawns and Gardens Not to Exceed One Half Acre in Area Per Family	0.1	Odin Falls 1	0.1	-	10/1/2018	0.1	Odin Falls 1 and 2; COBU pending for G-9982	0.9	0.03	1.05	0.03
G-12757	G-12330	-	1/15/1992	Quasi-municipal	0.457	Odin Falls 2		-	10/1/2023	0.22					
G-10290	G-9398	86874 T-12732	4/28/1981	Quasi-municipal	0.59	Powell Butte 2	-	-	10/1/2023	0.59	Red Cloud				
						Powell Butte 2						3.43	0.11	3.37	0.11
G-13616	G-12936	87594 T-12732	2/8/1994	Quasi-municipal	0.53	Red Cloud 1	-	-	10/1/2023	0.53					
						Red Cloud 2									
G-10349	G-9972	-	5/29/1981	Group Domestic Use for 28 Families Including Irrigation of Lawns and Gardens Not to Exceed One Half Acre in Area Per Family	0.57	Wild River 1	0.15	-	10/1/2024	0.57	Wild River	0.87	0.03	0.76	0.03
						Wild River 2	0.42								
G-10466	G-10019	86875	7/1/1981	Group Domestic Supply for 203 Families Including the Irrigation of Not to Exceed 1/2 Acre Lawn and Noncommercial Garden for Each	0.63	Chaparral 1	0.13	-		0.63	Chaparral	3.18	0.1	3.16	0.1
						Chaparral 3	0.35								
						Chaparral 4	0.401								
G-13446	G-18151	-	6/25/1993	Group Domestic Use for 102 Households Including the Irrigation of Not to Exceed 1/2 Acre Lawn and Noncommercial Garden for Each	0.29	PBVE 1	-	-	10/1/2025	0.29	Powell Butte View Estates	1.58	0.05	0.99	0.03
						Brasada 1									
						Brasada 2									
G-13726	G-13136	81805	6/27/1995 11/22/1996	Domestic Use Expanded for 53 homes	0.05** 0.188**	Tumalo Rim 1	-	39.8		0.24	Tumalo Rim	0.98	0.03	0.91	0.03
						Tumalo Rim 2									
G-18608	G-18198	-	2/12/2018	Quasi-municipal	0.67	SCCE 1	-	62	4/18/2024	0.67	Squaw Creek Canyon Estates	3.18	0.1	3.55	0.12
						SCCE 2									
						SCCE 3									
G-19169			6/21/2021	Quasi-municipal		SCCE 1	-	98		0	Pending application. This water right would be jointly limited to 0.67 cfs with permit G-18198, but would increase the authorized	Permit not yet issued			
						SCCE 2									
						SCCE 3									
G-8668	G-8033	-	2/27/1978	118 single Family Dwellings, including domestic use, irrigation of 0.2 acres per lot, and fire protection	0.30 (IR) 0.25 (DO) 0.01 (FP)	South Redmond Heights 1	0.56		10/1/2008	0.56	South Redmond Heights. Authorized use is for 118 single family dwelling, including domestic use, irrigation of 0.2 acres per lot, and fire protection.	5	0	5.6	0.5
G-15113	G-16617	95033	3/29/2000	Group Domestic Expanded for 14 Households	0.049	Happy Acres 1	0.049			0.049	Happy Acres	0.4	0	0.1	0

6. A description of customers served including other water suppliers and the estimated numbers; general water use characteristics of residences, commercial and industrial facilities, and any other uses; and a comparison of the quantities of water used in each sector with the quantities reported in the water suppliers previously submitted water management and conservation plan and progress reports;

6.a A description of customers served including other water suppliers and the estimated numbers;

Within the GAWS, Avion serves residential and commercial customers. As of 2020, 422 of Avion’s 12,990 service connections were for commercial customers. Avion’s satellite systems include a combined estimated 1,214 service connections for an estimated service population of 3,032. Satellite systems are composed overwhelmingly of residential customers.

As previously described, Avion also maintains an interconnection with Roats. Roats pays Avion a wheeling fee of \$0.04 per cu ft.

6.b General water use characteristics of residences, commercial and industrial facilities, and any other uses;

See Table 2.5 and Table 2.6

Table 2.5: Water consumption by customer category, 2016 – 2020.

Water Year	Consumption (MG)			
	Residential	Commercial	Percent Residential	Percent Commercial
2016	2166	304	87.7%	12.3%
2017	2316	334	87.4%	12.6%
2018	2242	329	87.2%	12.8%
2019	2320	277	89.3%	10.7%
2020	2464	352	87.5%	12.5%

Table 2.6: Number of accounts by customer category, 2016 – 2020.

Water Year	Accounts			
	Residential	Commercial	Percent Residential	Percent Commercial
2016	12522	298	97.7%	2.4%
2017	13187	317	97.7%	2.4%
2018	13415	306	97.8%	2.3%
2019	13648	337	97.6%	2.5%
2020	13782	422	97.0%	3.1%

6.c A comparison of the quantities of water used in each sector with the quantities reported in the water suppliers previously submitted water management and conservation plan and progress reports;

Table 2.7 shows a comparison of consumption from full years reported in the 2011 WMCP (1995 – 1996, 2002 – 2003, and 2006 – 2009) to data reported in Avion’s 2016 WMCP Progress Report (2011 through 2015), as reported in the 2016 WMCP Progress Report, and to consumption from 2016 through 2020. Avion did not report commercial and residential consumption separately in the 2011 WMCP. Over the last five years, in addition to growth within its service area, Avion has added Deschutes River Ranch, Squaw Creek Canyon Estates, and Happy Acres as satellite systems. Avion also took over a small portion of the former Juniper Water Service Area from the City of Bend in 2018. Consumption has grown at approximately the same average annual rate during the period from 2006 through 2009, and the 2015 through 2020 period and the period from 2011 through 2015.

Table 2.7: Comparison of 2016-2020 water consumption to 2011 – 2015 consumption and consumption reported in previous WMCP.

Year	Greater Avion Service Area Consumption Comparison (MG)	
	Residential	Commercial
1995	926	N/A
1996	1144	N/A
2002	1203	N/A
2003	1195	N/A
2006	1485	N/A
2007	1599	N/A
2008	1626	N/A
2009	1643	N/A
2011	1995	321
2012	1930	279
2013	2077	295
2014	1975	302
2015	2159	306
2016	2166	304
2017	2316	334
2018	2242	329
2019	2320	277
2020	2464	352
2006 – 2009 Average	1588	N/A
2011 - 2015 Average	2027	301
2016-2020 Average	2302	319
Average Annual Growth Rate (2006-2009 average to 2016-2020 average)	2.44%	
Average Annual Growth Rate (2011-2015 average to 2016-2020 average)	2.54%	1.21%

7. Identification and description of interconnections with other municipal supply systems;

Several interconnections currently exist between Avion and other suppliers. Avion and the City of Bend have two interconnections which are in place for emergency use by either system as needed. Avion also supplies the Bend Airport whose on-site water facilities are managed by the City. Avion has an additional three metered interconnections with Roats for delivery of potable water. See Appendix A for system schematics.

Avion’s Powell Butte View Estates water right is able to serve both the Powell Butte View Estates service area as well as the Brasada service area, for which Brasada LLC holds its own water right.

8. A schematic of the system that shows the sources of water, storage facilities, treatment facilities, major transmission and distribution line, pump stations, interconnections with other municipal supply systems, and existing and planned future service area; and

Appendix A includes a schematic of all GAWS and satellite system facilities, service territory, interconnections, and other relevant data.

9. A quantification and description of system leakage that includes any available information regarding the locations of significant loss.

Annual system loss averaged 7.1 percent from 2016 through 2020, below the required standard of 10 percent and similar to the calculated loss of 7.8 percent reported in the 2016 WMCP Progress Report. The losses are low mainly because Avion is a “young” utility compared to most municipalities. Most of the system facilities have been constructed during the last 30 years. There is currently no single identifiable location of significant loss. See Table 2.8 for more information.

Table 2.8: Calculated water loss, 2016 – 2020.

Water Year	Total Water Produced (MG)	Total Water Sold (MG)	Calculated Water Loss
2016	2733	2471	9.6%
2017	2882	2651	8.0%
2018	2927	2571	12.1%
2019	2707	2597	4.1%
2020	2854	2817	1.3%
Average	14103	13107	7.1%

From 2016 through 2018, a meter error at the Parrell Road interconnection between Avion and Roats resulted in low measurements of the volume of water entering Roats’ system. Avion’s production in the GAWS is equal to the sum of groundwater pumped from Avion’s own wells, plus the volume of water pumped from Roats Well 10, *less* the volume of water metered at the Roats’ interconnections. Therefore, an underestimate of the water metered at the interconnection will tend to *increase* Avion’s reported production. Recent data from Roats suggests that this likely increased Avion’s 2016 through 2018 water loss estimates by approximately 2 percent each year.

Additionally, Avion’s daily water quality testing identified multiple positive tests of *E. coli* during 2018. Avion flushed the water system and emptied multiple reservoirs for cleaning. The increased flushing resulted in an estimated 20 MG of additional water loss during the 2018 water year.

This page intentionally left blank.

3. 690-86-150 Municipal Water Conservation Element

The water conservation element shall include at least the following:

(1) A progress report on the conservation measures scheduled for implementation in a water management and conservation plan previously approved by the department, if any;

Avion's 2011 WMCP set benchmarks to continue Avion's existing conservation activities. These programs and progress are summarized in Table 3.1.

2) A description of the water supplier's water use measurement and reporting program and a statement that the program complies with the measurement standards in OAR chapter 690, division 85, that a time extension or waiver has been granted, or that the standards are not applicable;

Avion is not a governmental entity as defined by OAR 690-85-0008(9). Nevertheless, Avion's methods for measuring and computing water use are consistent with the provisions of OAR 690-085-0015. Avion has an active supply-side meter calibration and replacement program. All wells on the incoming side are tested biennially. Avion also complies with the OWRD reporting requirements for monthly and yearly water use reporting.

(3) A description of other conservation measures, if any, currently implemented by the water supplier, including any measures required under water supply contracts;

It is challenging for Avion to implement supplier financed water conservation programs under the tariff structure imposed by the PUC. Avion experiences little water loss, has a stable source of water supply, and all capital costs included in Avion's tariff are eventually passed on to the rate payer due to the nature of regulated utility companies. Avion does not expect that the PUC would be willing to allow an increase in Avion's rates to pay for water conservation programs.

The overarching goal of water conservation is to reduce impacts on the source of supply. As previously described, the aquifer in the Deschutes Basin is generally stable, but the impact of groundwater pumping on hydraulically connected surface water sources has raised concerns in the basin for decades. Avion continues to partner with the Deschutes River Conservancy (DRC) on the Blue Water Program. As a result of the challenges associated with implementing traditional conservation measures, Avion has found that the benefits of water conservation are most effectively realized through its Blue Water Program. The program allows Avion customers to donate to the DRC through their monthly water bill to protect water in-stream on the middle reach of the Deschutes River. From 2007 through 2018, the Blue Water Program contributed approximately \$140,000 toward instream leasing, cumulatively paying to protect 10.26 billion gallons, an average of about 8 cfs per year. This is equivalent to nearly one-third of Avion's maximum day demand, or the water savings associated with using over 3,200 high efficiency showerheads, 24 hours per day, throughout the entire irrigation season. Similar benefits to the water resource through xeriscaping would carry a significantly greater cost. Furthermore, whereas Avion's groundwater pumping ultimately affects streamflows in the Lower Deschutes River, below Lake Billy Chinook, the Blue Water Program protects water instream in dewatered reaches of the Deschutes River below Bend, greatly increasing the impact of water conservation efforts. Programs like Blue Water are more cost-effective approaches to water conservation, create greater benefits, are more equitable, and are more readily incorporated into Avion's structure of regulatory oversight in comparison to rate-payer funded program.

Despite the significant benefits of its Blue Sky program to the water resource in the Deschutes Basin, this program does not directly reduce Avion's demands.

This page intentionally left blank.

Table 3.1: Summary of Avion water conservation measures required under OAR 690-086-150.

Section Requirement	Sub-section Requirement	2011 Benchmark	2021 Progress Summary
OAR 690-086-150 (4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers:	(a) An annual water audit that includes a systematic and documented methodology for estimating any un-metered authorized and unauthorized uses	Continue annual water audit comparing production and consumption. The only un-metered uses are water lost to leakage, new construction activities, maintenance, hydrant flushing, and emergency firefighting.	Avion continues to compare production to consumption on an annual basis. If water losses are unusually high, Avion reviews authorized un-metered uses, including new construction activities, maintenance, hydrant flushing, and emergency firefights, and reviews SCADA data to estimate the authorized unmetered water uses.
	(b) If the system is not fully metered, a program to install meters on all un-metered water service connections.	The system will remain fully metered.	Avion's water system is fully metered.
	(c) A meter testing and maintenance program	Continue meter testing and maintenance plan.	Avion has continued to complete meter testing and maintenance consistent with manufacturer recommendations. Avion's billing software provides a monthly list of meters that have shown a large deviation from previous readings. Avion investigates those accounts, and, if needed, removes, tests, and replaces the meter.
	(d) A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections	Continue use of rate structure that includes a base rate and volumetric charge.	Avion uses a uniform block rate structure which includes a base rate and a commodity charge of \$0.99 per 100 cubic feet of water used. There is no allowance or a base volume before the per unit charge is applied. Avion's rate structure is determined by the Oregon Public Utility Commission.
	(e) If the annual water audit indicates that system leakage exceeds 10 percent, a regularly scheduled and systematic program to detect leaks in the transmission and distribution system using methods and technology appropriate to the size and capabilities of the municipal water supplier;	N/A - Non-revenue water is below 10 percent.	Avion's water loss averaged 7.1 percent for 2016-2020
	(f) A public education program to encourage efficient water use and the use of low water use landscaping that includes regular communication of the supplier's water conservation activities and schedule to customers	Continue distribution of public education materials (via conservation pamphlets, annual newsletter, annual consumer confidence report and the media) that focus on water saving practices and water-wise landscaping.	Avion continues to distribute public education materials that focus on water saving practices and water-wise landscaping.

(4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers:

a) An annual water audit that includes a systematic and documented methodology for estimating any un-metered authorized or unauthorized uses;

OWRD defines a water audit as an analysis of a municipal water supply system that includes a thorough accounting of all water that enters and exits the system. The water audit requires a systematic and documented methodology for estimating any unmetered authorized and unauthorized uses, and an analysis of the water suppliers own water use to identify alternatives to increase efficiency.

Avion will continue to conduct a water audit comparing production to consumption on an annual basis. Avion will document authorized unmetered water use for fire suppression or other events requiring hydrant access.

Because Avion is a private water utility, Avion's own water use is minimal.

b) If the system is not fully metered, a program to install meters on all un-metered Water Service Connections;

Avion's system is fully metered. Avion will continue to ensure that all production sources are metered or connected to Avion's Supervisory Control and Data Acquisition (SCADA) system, and that all customer service connections are metered.

c) A meter testing and maintenance program;

Avion will continue to test and maintain meters consistent with manufacturer recommendations. Avion will also continue to proactively identify meters that show a large deviation from previous readings on a monthly basis and investigate the potential cause of these deviations.

d) A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections;

Avion's rates are determined by the PUC. Currently, Avion's rates include both a base rate and a commodity charge of \$0.99 per 100 cubic feet per month. Avion expects this rate structure to continue.

e) If the annual Water Audit indicates that the system's Water Losses exceed 10 percent:

(A) Within two years of approval of the water management and conservation plan, the water supplier shall provide a description and analysis identifying potential factors for the loss and selected actions for remedy;

(B) If actions identified under subsection (A) do not result in the reduction of Water Losses to 10 percent or less, within five years of approval of the water management and conservation plan, the water supplier shall:

- (i) Develop and implement a regularly scheduled and systematic program to detect and repair leaks in the transmission and distribution system using methods and technology appropriate to the size and capabilities of the Municipal Water Supplier or a line replacement program detailing the size and length of pipe to be replaced each year; or,**
- (ii) Develop and implement a water loss control program consistent with American Water Works Association's standards.**

Avion's annual water audits indicate that the system's Water Losses do not exceed 10 percent.

f) Public Education Program

Avion will continue to distribute public education materials via conservation pamphlets, its annual newsletter, and communication through the media. See **Appendix B** for examples of educational messages regarding landscape water use included in Avion's materials to new customers and annual newsletters. Avion also includes information about proper winterization in the newsletter and on its website.

(5) If the Municipal Water Supplier serves a population greater than 1,000 and proposes to expand or initiate diversion of water under an Extended Permit for which resource issues have been identified under OAR 690-086-0140(5)(i), or if the Municipal Water Supplier serves a population greater than 7,500, a description of the specific activities, along with a schedule that establishes five-year Benchmarks, for implementation of each of the following measures; or documentation showing that implementation of the measures is neither feasible nor appropriate for ensuring the efficient use of water and the prevention of waste:

(a) Technical and financial assistance programs commensurate to the size of the Municipal Water Supplier to encourage and aid residential, commercial and industrial customers in implementation of conservation measures;

Avion provides technical support for any commercial or residential customer who is interested in assistance. Avion provides newsletters and pamphlets that provide assistance with conservation measures, including low water demand landscaping for Central Oregon.

Avion employees also assist customers with high water bills to detect leaks past the customer meter. As part of this effort, Avion will also proactively flag customers with potential leaks using its billing software.

The PUC has not allowed for any financial assistance programs in Avion's current rate structure.

(b) Supplier financed retrofitting or replacement of existing inefficient water using fixtures, including distribution of residential conservation kits and rebates for customer investments in water conservation;

Much of Avion's service area has developed during the last thirty years when Deschutes County and City of Bend development codes have required the installation of efficient water fixtures. Avion's own water use patterns indicate that there is limited opportunity for water savings through replacement of existing water using fixtures. However, in order to meet the requirements of OAR 690-85-150(5)(b), within the next five years, Avion will purchase 50 faucet aerators and 50 high efficiency showerheads for distribution to customers in person from Avion's office. **(c) Adoption of rate structures, billing schedules, and other associated programs that support and encourage water conservation;**

Avion's rates are determined by the PUC. Currently, Avion's rates include both a base rate and a commodity charge of \$0.99 per 100 cubic feet per month. Avion expects the PUC to continue to approve this rate structure.

(d) Water reuse, recycling, and non-potable water opportunities; and

Avion is strictly a water utility, and does not own or operate any wastewater collection or treatment facilities. The City of Bend owns the regional wastewater treatment plant and collects all wastewater for water utility customers of the City, Avion, and several other water utilities in the Bend area.

The wastewater treatment plant owned by the City of Bend is several miles from any significant Avion customer using large amounts of irrigation water. The plant is also downhill from most of Avion's customers. In 2011, Avion evaluated the costs of using the City of Bend's treated wastewater for irrigation. The cost for 8" diameter pipeline (the minimum size required to move significant water quantity) is about \$250,000 per mile. The cost to bring treated water to Lost Tracks Golf Course would be about \$2,000,000 and the water would have to be pumped up around 400 vertical feet. The cost for electricity to bring the effluent to the site would be almost identical to current production wells. Before reuse the wastewater may also require additional treatment at a significant cost.

Avion previously participated in negotiations between the City of Bend and the Pronghorn development, which resulted in Pronghorn using reclaimed water from the City's wastewater treatment plant to irrigate its two golf courses instead of Avion's potable water. Due to concerns related to the proximity of treated effluent water use to residences at Pronghorn, the City no longer delivers treated effluent to Pronghorn for irrigation.

(e) Any other conservation measures identified by the water supplier that would improve water use efficiency.

In July 2020, Avion requested that customers adhere to an even-odd watering schedule for the GAWS. This requires customers to use water for irrigation only on even or odd days, depending on what number matches their address. The intent of this measure was to reduce the maximum operational demand on Avion's system. Given natural fluctuations in day-to-day water use, the exact water savings from this measure are difficult to quantify. This measure can only reduce water demands to the extent that customers reduce the frequency of irrigation or presently concentrate water use on even or odd days.

This page intentionally left blank.

4. 690-086-0160 Municipal Water Curtailment Element

The water curtailment element shall include at least the following:

(1) A description of the type, frequency and magnitude of supply deficiencies within the past 10 years and current capacity limitation. The description shall include an assessment of the ability of the water supplier to maintain delivery during long-term drought or other source shortages caused by a natural disaster, source contamination, legal restrictions on water use, or other circumstances;

Avion's water source, the Deschutes aquifer, has been a reliable source of supply. Although minor seasonal fluctuations in water levels do occur, even the effects of the recent long-term drought have not impacted well production or static water levels to a measurable degree for Avion's water supply wells.

A few possible scenarios that would require some level of use curtailment are 1) a hazardous waste spill at or near a well site, 2) equipment failure, 3) an area-wide, extended power outage, and, 4) a natural disaster causing multiple pipelines to rupture. Although these are unlikely, it is prudent to have a plan in place to deal with the emergency with the least amount of disruption. It is also possible that emergencies might occur that are very unlikely, based upon past experience.

In the first scenario noted above, the design of the Avion system would prevent any significant disruption of service. The same would be true for scenario 2, assuming one pumping station is affected. The production of other, unaffected wells would be adjusted, and the well at the site of the contamination would be shut down until cleanup was completed, and testing demonstrated the water supply was safe.

Scenarios 3 and 4 would result in an immediate need for drastic reductions in water use in order to assure the longest possible time to restore power while providing for minimal health and safety allocations. The electrical supply is further protected from outages, because Avion is served by two different utilities on two different power grids. Some of the production well sites are served by Central Electric Cooperative and others by Pacific Power and Light. It thus remains highly unlikely both systems would experience area-wide outages at the same time. Avion does have the right to curtail all but the water required for basic needs during these situations.

(2) A list of three or more stages of alert for potential shortage or water service difficulties. The stages shall range from a potential or mild alert, increasing through a serious situation to a critical emergency;

In its previous WMCP, Avion described a curtailment plan with four stages of alert, triggers, and curtailment measures to be implemented at each stage. Avion has modified its approach to curtailment to a plan with three stages, and has modified the triggers and curtailment measures from the previous WMCP to better serve Avion's potential needs during a curtailment event. The curtailment stages are:

- Stage 1: Water Alert
- Stage 2: Serious Water Shortage
- Stage 3: Emergency Water Shortage

These stages are of increasing severity and could be initiated and implemented in progressive steps or a later stage could be implemented directly. The plan includes both voluntary and mandatory measures, depending upon the cause, severity, and anticipated duration of the shortage.

Exhibit 4-1 presents the initiating conditions for each of the three stages. Initiation of a curtailment stage is based on the specific circumstances of the actual event. The decision to implement curtailment

will also consider the knowledge and judgment of Avion staff members familiar with the water system. Staff members may evaluate the extent of system damage or contamination, duration of repair, costs, and weather forecasts, among other considerations, to determine the most appropriate curtailment stage to select.

Exhibit 4-1. Water Curtailment Stages and Potential Initiating Conditions.

Water Curtailment Stage	Potential Initiating Conditions¹	Goal
Stage 1: Water Alert	<ul style="list-style-type: none"> • Daily demand is 80% of maximum water production or distribution system capacities. • Minor infrastructure failures or electrical outages that are expected to be of short duration. • Hot, dry weather anticipated to abate quickly. 	Customer awareness and reduce demand by 5 percent
Stage 2: Serious Water Shortage	<ul style="list-style-type: none"> • Daily demand is 81-90% of maximum water production or distribution system capacities. • Infrastructure failures or electrical outages at wells that are expected to last longer than two days. • Hot, dry weather anticipated to continue for several days. 	Reduce demand by up to 15 percent
Stage 3: Emergency Water Shortage	<ul style="list-style-type: none"> • Daily demand is greater than 90% of maximum water production or distribution system capacities. • Contamination of multiple wells • Failure of one or more critical parts of the water system • Hot, dry weather anticipated to continue into the foreseeable future. • A forest fire in the Woodside area. 	Reduce demand by more than 15 percent and maintain potable supplies for human consumption and public health and safety

¹ Maximum water production capacity is equivalent to the rate at which Avion can produce water. Distribution system capacity includes the capacity of distribution lines, pump stations, and reservoirs.

Avion, being a private water utility, lacks the regulatory authority to enforce rationing by its customers. If shortages at the Stage 1 or 2 levels persist for extended periods, and voluntary reductions by all customers are unsuccessful, Avion may have to seek assistance from the PUC in order to enforce the reductions. Avion's tariff allows for the placement of restrictions on "sprinkling and other outside uses" in the event of an emergency, and Oregon Health Division statutes impose restrictions by use type. Such restrictions must be non-discriminatory and must be proven to be necessary. Notice must be provided to the customers and to the PUC in a prescribed manner in writing. Avion's monthly water use data shows that summer use averages are 3 to 6 times the average amounts used in the winter months. It therefore seems clear that significant percentage reductions of total use during the high use period of the year could be easily achieved through reductions of outside watering use on a voluntary basis. As a water purveyor, Avion is responsible for providing minimum health and safety needs for their customers at all times.

(3) A description of pre-determined levels of severity of shortage or water service difficulties that will trigger the curtailment actions under each stage of alert to provide the greatest assurance of maintaining potable supplies for human consumption; and

Table 2.1 lists Avion pump station capacities, and the failure of any one of the pump stations would not require any emergency reductions in consumption. Avion's standards for design and construction provide that all systems be redundant, so that one failure will not lead to shortages. With the reliability of the aquifer, Avion does not anticipate any water shortage other than that caused by large-scale equipment failure, a natural disaster which would lead to pipelines rupturing, or an extended power outage. If Avion's water service were curtailed by natural disaster, massive equipment failure, or extended power failure the alert levels in table 4.1 would be implemented as required.

(4) A list of specific standby water use curtailment actions for each stage of alert ranging from notice to the public of potential alert, increasing through limiting nonessential water use, to rationing and/or loss of service at the critical alert stage.

Stage 1: Water Alert

Under Stage 1, Avion will ask customers to take voluntary actions to curtail water use, such as:

- Request voluntary reduction in irrigation by all customers: encourage limiting irrigation to every fourth day under the existing even and odd street number system.
- Flushing lines for essential needs only.

Stage 2: Serious Water Shortage

Under Stage 2, Avion will request additional voluntary measures to curtail water use, such as:

- Reduction of construction use and park irrigation.
- Request limiting refill of pools and use of other outdoor water features, except those with fish or other aquatic creatures (e.g., ponds and fountains).
- Request cessation of hosing of pavement except as necessary for public health.

Stage 3: Emergency Water Shortage Status

Under Stage 3, Avion will seek the approval of the PUC to make all voluntary actions under Stages 1 and 2 mandatory. In addition, Avion may also adopt the following mandatory measures:

- 1) Avion may enforce a no non-essential water use program with the cooperation of the local municipalities and the Oregon P.U.C. A no non-essential water use program will eliminate all outside irrigation.
- 2) Avion may reduce or interrupt water supply to customers with whom Avion has negotiated contracts that allow such actions (e.g., Avion's contracts with Pronghorn Resort, Lost Tracks Golf Course, and The Old Back Nine Golf Course allow for interruption of supply during times of shortage.)
- 3) Avion may implement moratoriums on new service connections and construction water use during water shortages.

5. 690-086-0170 Municipal Water Supply Element

This section includes population and water supply projections for the GAWS and for one of Avion's satellite systems, Squaw Creek Canyon Estates (SCCE). For all other satellite water systems, Avion does not anticipate significant population growth within the term of this WMCP. In many cases, the satellite water systems acquired water right permits for group domestic use for a platted development and Deschutes County land use laws would not allow further expansion of the water system without additional land use approvals.

Within the term of this WMCP, it is possible that Avion will seek new water rights as a result of acquiring existing small water systems, or through agreement with new planned developments that Avion currently does not serve. However, Avion has no plan to submit new water right permit applications for new water systems in addition to those identified in Table 2.2 at this time.

The water supply element shall include at least the following:

(1) A delineation of the current and future service areas consistent with state land use law that includes available data on population projections and anticipated development consistent with relevant acknowledged comprehensive land use plans and urban service agreements or other relevant growth projections;

Current and Future Service Areas

Avion's current water service areas are delineated in Appendix A. As described above, Avion anticipates minimal population growth within its satellite systems, with the exception of SCCE. No changes are anticipated to Avion or other water providers' service territories within the City of Bend urban growth boundary. Avion would only expand the GAWS service area outside of urban growth boundaries if approached with requests for water service to existing or planned communities. Avion evaluates such requests on a case-by-case basis. It is important to note that Avion's provision of water service generally requires that the customer secure all necessary land use approvals.

Population Projections

Greater Avion Water System

The GAWS includes lands within the city limits and urban growth boundary of the City of Bend and some lands outside the urban growth boundary. Avion's exact service population is therefore difficult to estimate. As described above, the GAWS includes an estimated 12,990 water service connections. Assuming 2.49 persons per household, and assuming that each household has a service connection), this amounts to a service population of 32,345.

Given the nature of UGB and zoning changes, high unmet housing demand in the Bend UGB, and the tendency for new development to occur in large blocks, it is hard to provide a precise estimate of future growth for Avion. Avion used the same approach to projecting the service population of the GAWS as described in Avion's permit extension application for Permit G-18474. Avion assumes that the GAWS service population will grow at the same rate as the Bend UGB is projected to grow as documented in the Coordinated Population Forecast for Deschutes County (Portland State University Population Research Center, June 30, 2018). For consistency with the projections described in the permit extension application for Permit G-18474, Avion will project both population and demand using the 2020 service population of 32,337 for the GAWS at the time the permit extension application was developed. Table 5.1 shows the 20-year average annual growth rate for the City of Bend UGB and the projected population of the GAWS in 5-year increments.

Table 5.1. 5-year AAGR from Population Research Center, Portland State University, June 30th, 2018 and GAWS projected population.

Year	2020	2025	2030	2035	2040
Bend UGB PSU 5-year Average Annual Growth Rates (AAGRs)		2.15%	2.45%	2.29%	2.07%
Avion population projections	32,337	36,003	40,691	45,634	50,609

SCCE

Population growth within the SCCE system is shown in Table 5.2. Avion assumes that all parcels within the platted boundary of SCCE for which land use approval for residential development has been obtained will be built out within the next five years. The 10-year and 20-year population projections are identical to the projected population growth through 2025.

Table 5.2. Projected population growth at SCCE.

	Service Connections	Estimated Service Population
2020 Service Connections	188	468
Projected Connections (2025)	233	580

(3)¹ Based on the information provided in section 1 of this rule, an estimate of the water supplier’s water demand projections for 10 and 20 years, and at the option of the municipal water supplier, longer periods:

Demand Projections

Greater Avion Water System

The maximum operational demand (the maximum 4-hour rolling average demand that Avion must plan for) for the GAWS was 34.1 cfs in 2020. Avion projects that water demands for the GAWS will grow at the same rate as the population of the GAWS is projected to grow. Table 5.3 shows the 20-year average annual growth rate for the City of Bend UGB and the projected average day, maximum day, and maximum operational demand for the GAWS.

Table 5.3. Projected demands for the GAWS, 2020 – 2040.

Year	2020 (actual)	2025	2030	2035	2040
Growth Rate		2.15%	2.45%	2.29%	2.07%
Average Annual Demand (MG)	2616	2913	3292	3692	4095
Maximum Day Demand (MG)	18.0	20	23	25	28
Maximum Operational Demand (cfs)	34.1	38.0	42.9	48.1	53.4

SCCE

There are three wells at SCCE. The primary well, Well 1, produces 300 gpm and is used to meet system demands. Wells 2 and 3 each produce approximately 50 gpm and operate as backups to Well 1. The operation of the system is not expected to change in the future—Avion still plans to operate at a maximum rate of 300 gpm, but Avion expects wells to pump for longer durations.

¹ The response to OAR 690-86-0170(3) is presented prior to OAR 690-86-0170(2) because the schedule for development is dependent upon the demand projections.

When Avion acquired the SCCE water system, the previous owner provided monthly demand information for the 2016 water year showing use of a total of approximately 48 acre-feet. Avion based its buildout demand projection of 62 acre-feet on that information. After taking over management of the system, Avion began replacing all customer and production meters. Improved data for 2020 showed annual water demand of over 100 acre-feet. Table 5.4 shows projected demands for SCCE at buildout in 2025.

Table 5.4. Projected water sales for SCCE, 2020 – 2025.

	Service Connections	Estimated Service Population	Annual Water Demand (MG)	Annual Water Demand (AF)
2020	188	459	38.4	117.7
Projected at Buildout (2025)	233	580	47.5	145.8

(2) An estimated schedule that identifies when the water supplier expects to fully exercise each of the water rights and water use permits currently held by the supplier;

Tables 5.5 through 5.7 describe the timeline for development of Avion’s undeveloped water use permits and inchoate transfers.

(4) A comparison of the projected water needs and the sources of water currently available to the municipal water supplier and to any other suppliers to be served considering the reliability of existing sources

Greater Avion Water System

Table 5.5 shows the projected timeline for Avion to apply the maximum authorized rate of its GAWS water rights to beneficial use. The table does not include quasi-municipal or group domestic permits jointly limited with Certificate 84975/Inchoate Transfer T-13353 to a maximum rate of 25.2 cfs. These water rights authorize the use of water from a number of wells that are not authorized points of appropriation under the water rights identified in Table 5.5. However, because the authorized rates of these water rights are jointly limited with Certificate 84975/Inchoate Transfer T-13353, which is already fully utilized, they cannot factor into how Avion will meet its projected future demand. The projection also does not include consideration of temporary transfer T-13140, as this is not a reliable source of supply beyond the term of the approved temporary transfer and of Avion’s agreement with Gold Ring.

Table 5.5. Estimated schedule for development of GAWS water rights, 2020 - 2040. Green highlights denote full development of the maximum rate of each water right.

	2020	2025	2030	2035	2040
Maximum Operational Demand (cfs)	34.1	38.0	42.9	48.1	53.4
Certificate 84975/T-13353 and permits with shared rate limits (cfs)	25.2	25.2	25.2	25.2	25.2
Permit G-17539 (cfs)	4.95	6.03	6.03	10.00	10.00
Permit G-16025 (cfs)	0.00	2.78	5.00	5.00	5.00
Permit G-18474 (cfs)	3.97	3.97	6.69	7.94	10.00
New Permits (cfs)	0.0	0.0	0.0	0.0	3.2

The 2040 projected maximum operational demand of 53.4 cfs exceeds the combined rate of Avion’s water rights for the GAWS. In order to meet the 2040 projected demand, Avion will need to fully utilize the full rate of permits G-17539, G-16025, and G-18474, and will need additional water supply through

a new water right prior to 2040. Avion is seeking access to the full amount of water authorized under permits G-17539, G-16025, and G-18474.

In addition to the permits shown in the table above, Avion has two additional permits and one inchoate transfer under development for wells and developments within the GAWS system. The current anticipated timeline for development of these permits is shown in Table 5.6.

Table 5.6. Estimated schedule for development of GAWS water rights not additive to the rate of Certificate 84975/Inchoate transfer T-13353.

Permit or Transfer Number	Projected Development Date	Remaining Work to be Completed for Full Development of Water Right
G-9971	10/1/2022	Permit G-9971 is for group domestic water use on 151 lots in the Boonesborough development. Although Avion has developed the full rate of permit G-9283, Avion cannot make proof until full buildout of the authorized number of lots. Avion has no control over the pace of development of the remaining lots authorized by the water right permit.
G-11972	10/1/2022	Permit G-11972 is for group domestic water use on 78 lots in the Codyville development. Although Avion has developed the full rate of permit G-9283, Avion cannot make proof until full buildout of the authorized number of lots. Avion has no control over the pace of development of the remaining lots authorized by the water right permit.
T-10205	10/1/2028	Avion requires additional time to develop infrastructure to deliver water to the Northeastern portion of the proposed place of use.

SCCE

Avion is already utilizing the full authorized rate of permit G-18198 and has completed development of the first increment of mitigation under its incremental mitigation plan, providing 24.16 mitigation credits from MP-114 to authorize appropriation of 60.4 acre-feet of groundwater. Permit G-18198 includes a condition requiring submittal of a WMCP before the use of the second increment of water development occurs. Upon submittal of this WMCP, Avion will work with OWRD staff to adjust its incremental development plan and assign mitigation credits to Permit G-18198 sufficient to develop the second increment of mitigation and begin development of a claim of beneficial use.

Avion has also submitted a new water right permit application to increase the authorized annual volume of use at SCCE. As shown Table 5.4, the projected annual demand at buildout of 233 service connections is 145.8 acre-feet. Avion submitted application G-19169 on June 21, 2021. The application requests the use of up to 98 acre-feet. Combined with the 62 acre-feet already authorized for use under permit G-18198, this would allow use of up to 160 acre-feet, equal to the projected buildout demand of 145.8 acre-feet, plus a 10 percent allowance for an increase in the length of the growing season due to climate change. Avion requested that the maximum rate of use of application G-19169 be jointly limited with Permit G-18198 to 0.67 cfs, as Avion believes the existing well capacity is sufficient to meet future demands.

Other Satellite Systems

In addition to the SCCE permit, Avion has several additional permits and one inchoate transfer under development for other satellite systems. The current anticipated timeline for development of these permits is shown in Table 5.7.

Table 5.7 Estimated schedule for development of water rights for Avion satellite water systems.

Permit or Transfer Number	Projected Development Date	Remaining Work to be Completed for Full Development of Water Right
G-9283	10/1/2027	Permit G-9283 is for the Cinder Butte water system. Consistent with Avion’s 2027 permit extension application, Avion expects water to be put to full beneficial use by 2027. As of 2018, there are two undeveloped lots remaining in the Cinder Butte development.
G-12330	10/1/2023	Permit authorizes the use of water for quasi-municipal purposes at the Odin Falls II development, which is not yet complete.
T-12732	10/1/2023	Avion completed development of Powell Butte Well 2. Avion plans to make full beneficial use of the water under the permit and submit a COBU prior to 10/1/2023.
G-9972	10/1/2024	Permit G-9972 is for group domestic water use on 188 lots in the Wild River development. Although Avion has developed the full rate of Permit G-9972, Avion cannot make proof until full buildout of the authorized number of lots. Wild River currently has 109 service connections. Avion has no control over the pace of development of the remaining lots authorized by the water use permit.
G-18151	10/1/2025	Permit G-18151 is for group domestic water use on 102 lots in the Powell Butte View Estates development. Although Avion has developed the full rate of Permit G-18151, only 94 of the 102 lots have been developed; Avion cannot make proof until full buildout of the authorized number of lots. Avion has no control over the pace of development of the remaining lots authorized by the water right permit.

(5) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, and analysis of alternative sources of water that considers availability, reliability, feasibility, and likely environmental impacts. The analysis shall consider the extent to which the projected water needs can be satisfied through:

(a) Implementation of conservation measures identified under OAR 690-086-0150;

The water conservation and management efforts of Avion and its customers described in Section 3 have and will continue to reduce demands. But water conservation efforts have not been able to offset the rapid growth of the GAWS, particularly for the single family homes most common in Avion’s service area. The effects of the existing conservation measures identified in section 3 to meet the requirements of OAR 690-86-0150 are generally already reflected in the 2020 water demands used as a basis for Avion’s 2040 demand forecast. Avion’s proposed new water conservation measure, distribution of free faucet aerators and showerheads, will have a minimal impact on Avion’s demand for multiple reasons. First, most residential units Avion serves were developed when the building codes already required water efficient fixtures. Second, distribution of new water efficient fixtures may marginally reduce indoor demand, but indoor water use is only a portion of Avion’s peak season demands.

In compliance with the requirements of OAR 690-86-170(5)(a), in order to conduct an analysis of the potential impact of conservation measures, Avion assumed the distribution of a much larger number of water efficient faucet aerators and showerheads than anticipated by Avion's water conservation benchmarks. Avion assumed the following:

- 1) A reduction in per-fixture water use for faucets from 2.2 gpm (the 1992 water efficiency standard) to 1 gpm, and for showerheads from 2.5 gpm (the 1992 standard) to 1.25 gpm;
- 2) Full replacement of faucets and showerheads in 1,000 service connections with three faucets and two showerheads, representing adoption by approximately 1 in 6 Avion service connections as of 1994, and assuming no voluntary upgrades have already been made; and
- 3) Use of each faucet and showerhead for a duration of 30 minutes each day.

Based on these assumptions, Avion's daily demand could be reduced by as much as 183,000 gallons per day. This amounts to approximately 1 percent of Avion's 2020 maximum day demand of 18 MG. Assuming a proportional impact on Avion's projected maximum operational demand of 53.4 cfs in 2040, Avion's projected maximum operational demand could be reduced to 52.87 cfs ($53.4 * 0.99 = 52.87$).

As shown in Table 5.5, Avion currently meets demands in the GAWS by providing water under Certificate 84975/T-13353 and Permits G-17539, G-16025, and G-18474. In OWRD's WMCP final order signed September 12, 2011 Avion was granted "greenlight water" for all 5 cfs under Permit G-16025, all 10 cfs under Permit G-16026 (now Permit G-17539), and Avion is now also seeking access to all 10 cfs under extended Permit G-18474 – providing Avion a total of 50.2 cfs of water supply for the GAWS. Avion's projected 2040 demand is 53.4 cfs. Therefore, Avion would need to reduce water use by 3.2 cfs (6 percent) in order to eliminate the need for access to water under Permits G-17539, G-16025, and G-18474. The above analysis shows that implementation of conservation measures under OAR 690-86-150, even when expanded to reach a larger population, would only reduce water demand by approximately 1 percent. As a result, these conservation measures will not preclude Avion's need to fully develop its permits, and Avion is seeking access to the full amount of water under Permits G-17539, G-16025, and G-18474.

(b) Interconnection with other municipal supply systems and cooperative regional water management; and

With the exception of the City of Bend airport water system, which is independent of the City's main water system and supplied by Avion, interconnections to the City of Bend are only intended for use during emergencies. There have been no discussions with the City of Bend regarding regular use of the interconnection for water delivery.

Avion also has two interconnections with Roats Water System. Avion delivers water to Roats through these interconnections, making up the majority of Roats' water supplies. Interconnections with Roats currently only allow delivery of Avion water to Roats. Avion does receive water from Roats' Well 10, but Avion does not believe that Roats has access to additional water beyond what is delivered from Well 10 to serve Avion's future needs.

(c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.

The Upper Deschutes Basin is closed to new surface water appropriations. The Deschutes Aquifer is the only water supply source available to Avion. There are no other identified sources available to Avion.

As described above, conservation savings of greater than 6 percent compared to Avion's 2040 demand forecast would be required in order for Avion to reduce demands by an amount sufficient for Avion to avoid the need for the full amount of water authorized under Permits G-17539, G-16025, and G-18474.

When evaluating the cost-effectiveness of water conservation measures, it's important to consider the implications of Avion's status as a fully-rate regulated utility. Avion's rates are set based on an estimate of Avion's required revenue to provide water service to its customers. When setting Avion's rates, the PUC conducts an investigation of Avion's capital structure, operating costs, and quality of service. Following this investigation, Avion and the PUC typically come to an agreement about Avion's revenue requirement. As described in section 2, the PUC allows Avion to collect 40 percent of its revenue from commodity sales, while 60 percent comes from the base cost. Commodity sales therefore make up a significant portion of Avion's revenue requirement and all of Avion's profits.

In previous years in which water demands were significantly decreased, Avion has experienced an operating loss. For example, the summer of 1993 was cold and wet, which caused Avion's customers to substantially reduce their irrigation water use.² Lost revenue was about \$150,000, while savings on expenses was approximately \$15,000. The operating loss had a serious and long-term impact on Avion's financial health; bank loans had to be renegotiated, and reserves of cash were depleted.³

This example illustrates that, from Avion's perspective as a water provider, lost revenue from reduced demands greatly exceeds the marginal cost of providing water. Reductions in customer water demands do not result in a reduction in most operating costs, including the staff required to operate the water system, which includes the same number of valves, pumps, and length of pipe whether customers reduce water demands or not. It is not possible for Avion to fund water conservation measures without the advance approval of the PUC to raise rates to account for both the cost of implementing conservation measures as well as to make up for lost revenue from reduced water sales. This is necessary in order for Avion to meet its revenue requirement agreed upon with the PUC.

If the PUC were to allow for the inclusion of water conservation measures such as lawn replacement or sprinkler system improvements in Avion's rate structure, the cost of implementing the conservation measures would need to be incorporated into Avion's rates. However, Avion's revenue requirement would not be reduced significantly because, as described above, the cost to operate the water system will not be significantly reduced by a reduction in demand. As a result, Avion's per unit water rates would also need to increase to account for reduced demand, eliminating any cost savings that would have been realized by the initial invest in the demand-reducing technology. This is why demand reduction measures are poor proposition for Avion's customers, and is why it may be difficult for Avion to gain approval for such measures from the PUC.

This provision requires an analysis of whether Avion's need for greenlight water could be avoided through water conservation measures that would provide water at a *lower cost* than expansion of water use under Permit's G-16025, G-17539, and G-18474. The above discussion provides an explanation of why it is not possible to realize reductions in operational costs from water conservation measures. But over the long term, could water conservation measures be cost-effective by means of reducing the need to construct additional water supply infrastructure (wells and reservoirs)?

The City of Bend's 2020 WMCP describes a water conservation analysis the City completed as part of its Integrated Water System Master Planning effort. The present value of water utility costs for water saving measures is over \$11 million for water savings of approximately 5.1 mgd (7.89 cfs), a cost of approximately \$1.4 million per cfs. Section 3 of the City's WMCP identifies the primary source of cost savings as the avoided cost from construction of three wells at a cost of \$7 million per well site. Due to

² The per-customer deviation from average was a reduction of about 8 percent.

³ Avion's bank loans were not rectified until the end of 1995 and cash reserves were not completely restored until the end of 1998.

differences in the City's and Avion's systems, where water supply infrastructure can be located, and in regulatory requirements the City and Avion must meet in developing water supply infrastructure, Avion's cost for development of new well sites is lower than the City's. At a cost of approximately \$11 million, the cost of water conservation measures is higher than the cost for Avion to develop multiple water supply wells. Avion's per well cost is currently approximately \$1.2 million for a well producing an estimated 1,200 gpm, a cost of about \$450,000 per cfs.

Although other water conservation measures do not appear to be cost-effective, Avion is nonetheless making efforts to protect the water resource in the Deschutes Basin. As described in section 3, Avion and the DRC's blue water program contributed approximately \$140,000 toward instream leasing from 2007 through 2018 to protect an average of 8 cfs per year (5.17 mgd), a significantly greater benefit to the Deschutes than can be realized through demand reduction measures at a lower (and voluntary) cost to Avion's customers. However, despite the significant benefit to the water resource, this program does not result in any direct reduction in Avion's water demands.

(6) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, a quantification of the maximum rate and monthly volume of water to be diverted under each of the permits.

As described above, Avion projects it will need access to the full amount of water under permits G-17539, G-16025, and G-18474 within the 20 year planning period of this WMCP. The maximum projected rate of withdrawal would be the full rate authorized by the permits; 10 cfs, 5 cfs, and 10 cfs, respectively. The maximum monthly volume, based on a 24-hour daily pumping cycle for one month would be 100.17 MG for G-16025 and 200.34 MG for G-17539 and G-18474.

(7) For any expansion or initial diversion of water under existing permits, a description of mitigation actions the water supplier is taking to comply with legal requirements including but not limited to the Endangered Species Act, Clean Water Act, Safe Drinking Water Act; and

Permits G-17539, G-16025, and G-18474 require mitigation as part of the Deschutes Basin Groundwater Mitigation Program to offset the impacts to surface water from use of groundwater. This requires Avion to provide mitigation credits to offset the volume of consumptive use of water under each of the above permits. Avion's wells are located in the General Zone or Middle Deschutes Zone of Impact, so water use under the above listed permits generally requires restoration of streamflow from the Bend area to the mouth of the Deschutes River. Permits G-17539 and G-18474 have mitigation obligations of 514.8 acre-feet and Permit G-16025 has a mitigation obligation of 302.2 acre-feet. Avion has an approved incremental mitigation plan on file with OWRD for each permit and will continue to use water under its permits in compliance with the incremental mitigation plans. Avion is not required to take any other mitigation actions in order to comply with the Endangered Species Act, Clean Water Act, Safe Drinking Water Act, or other federal laws.

(8) If acquisition of new water rights will be necessary within the next 20 years to meet the needs shown in section (3) of this rule, and analysis of alternative sources of the additional water that considers availability, reliability, feasibility and likely environmental impacts and a schedule of development of the new sources of water. The analysis shall consider the extent to which the need for new water rights can be eliminated through:

Table 5.4 and Table 5.5 show that Avion will require a new water right for the GAWS within the next 20 years, and for SCCE immediately. Avion has completed separate analyses for Greater Avion and SCCE below. New water rights are not required for any of Avion's other satellite water systems.

(a) Implementation of conservation measures identified under OAR 690-086-0150;

Greater Avion Water System

As described previously, Avion's authority to implement water conservation measures commonly employed by other (municipal) water providers to reduce customer water demands is limited. Avion's current rate structure does not allow Avion to recover the cost of investments in water conservation. Avion's current conservation efforts are already reflected in the 2020 water demands used as a basis for Avion's 2040 demand forecast. These projections show a shortfall of over 3 cfs within the 20-year planning horizon of this WMCP. As described in section (5)(a), above, even implementation of an expanded program of replacing old faucet aerators and showerheads that met 1992 water efficiency standards with those exceeding modern water efficiency standards would reduce Avion's projected maximum operational demand by approximately 1 percent. The program would reduce the rate required under a new water right based on 2040 forecast demands, but would not entirely eliminate the need for a new water right.

SCCE

As described above, the SCCE system had no water right at the time Avion took over management of the system. Avion applied for a water right based on inaccurate meter information provided by the previous owner of the system. Avion has since replaced all water sales meters and tested all production meters. Avion has applied for a new water right (Application G-19169). The proposed rate of water use under Application G-19169 would not be additive to the current water use Permit G-18151. Application G-19169 would increase only the annual volume of water use. Similar to the GAWS, because development at SCCE has been recent, retrofitting of indoor water fixtures and other conservation measures under OAR 690-86-0150 would not be expected to produce significant water savings, and would not reduce demand by the amount that would be necessary to avoid the need for a new water use permit for SCCE.

(b) Inter-connection with other municipal supply systems and cooperative regional water management; and

Greater Avion Water System

As described for OAR 690-86-0170(5)(b), above, Avion has interconnections with other water providers. However, there does not appear to be any opportunity to use those interconnections as a source of water supply for Avion on a regular basis. The City of Bend and Roats have similar limitations on their water rights and water supplies to Avion.

SCCE

SCCE does not currently have any interconnections with other water systems. There are other small water systems in the vicinity of SCCE to which SCCE may be able to connect in the future. However, these home owner association water systems are smaller than the SCCE development, and are therefore unlikely to have enough water to supply SCCE. An interconnection with the City of Sisters, even if feasible, likely would not be allowed under State of Oregon land use laws. Because the use of a greater volume of water from SCCE's existing infrastructure costs very little, any interconnection with another water system would exceed the cost of obtaining a new water right.

(c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.

Greater Avion Water System

As described for OAR 690-86-0170(5)(c), above, the cost of water conservation exceeds the cost of developing additional water supplies. Avion will continue to evaluate water conservation opportunities that are within its authority to implement, dependent on the approval of the PUC. Avion will also

continue to participate in the Blue Water Program in partnership with the DRC to improve Deschutes River irrigation season streamflows.

SCCE

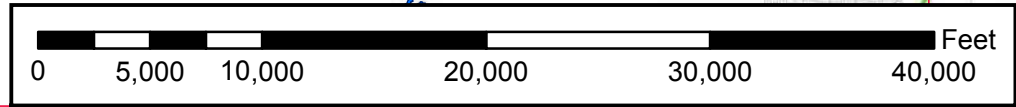
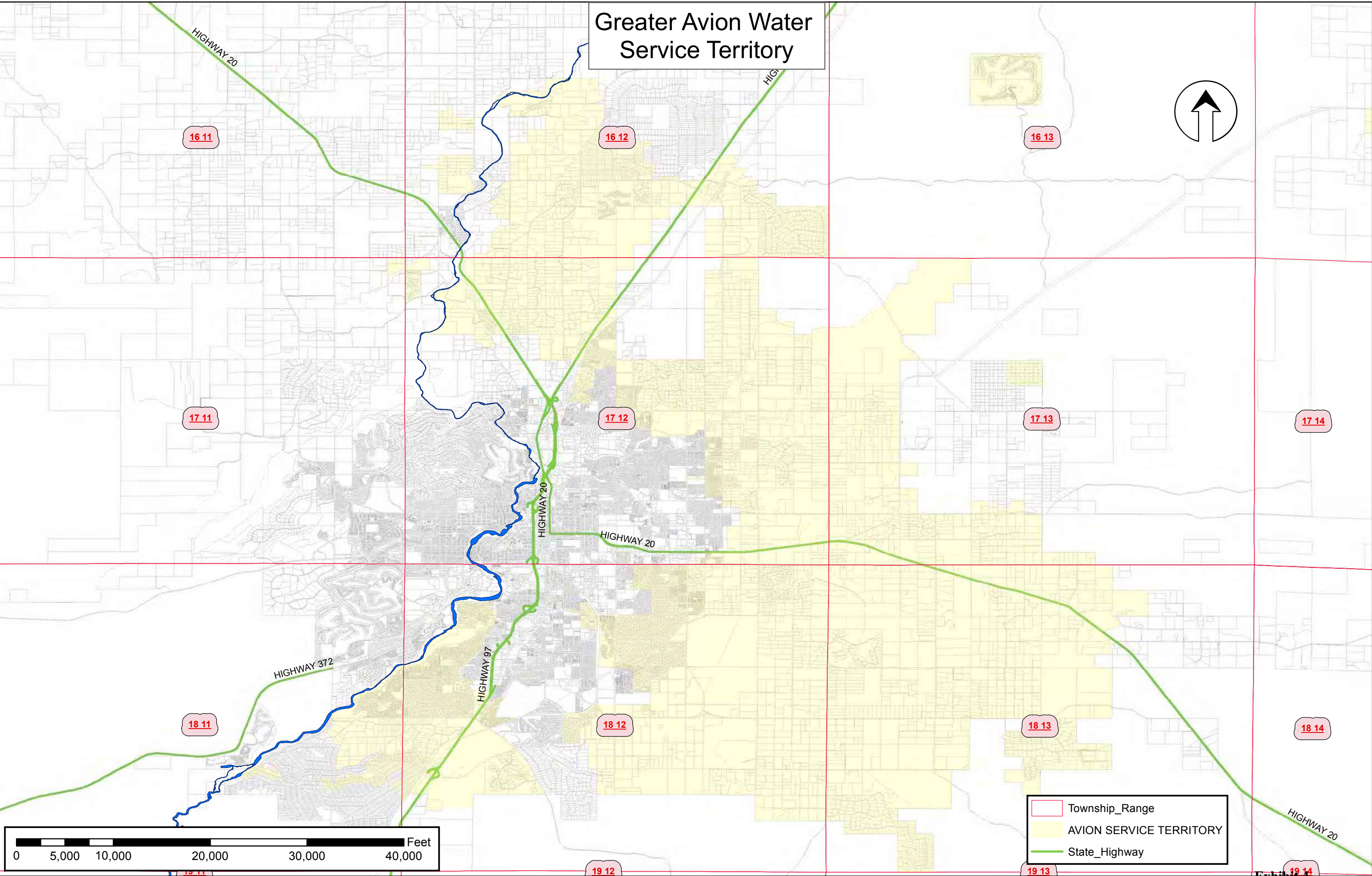
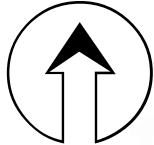
As described above, the use of an additional volume of water from SCCE's existing infrastructure does not require any additional investment. Because Avion does not need to increase the maximum rate of water use at SCCE, only the maximum annual volume of water use, there is no change to the water supply infrastructure required at SCCE. Furthermore, measures that would reduce the maximum rate of demand, such as even-odd watering schedules, would not necessarily reduce the volume of annual demand.

Appendix A

Service Area and System Schematics

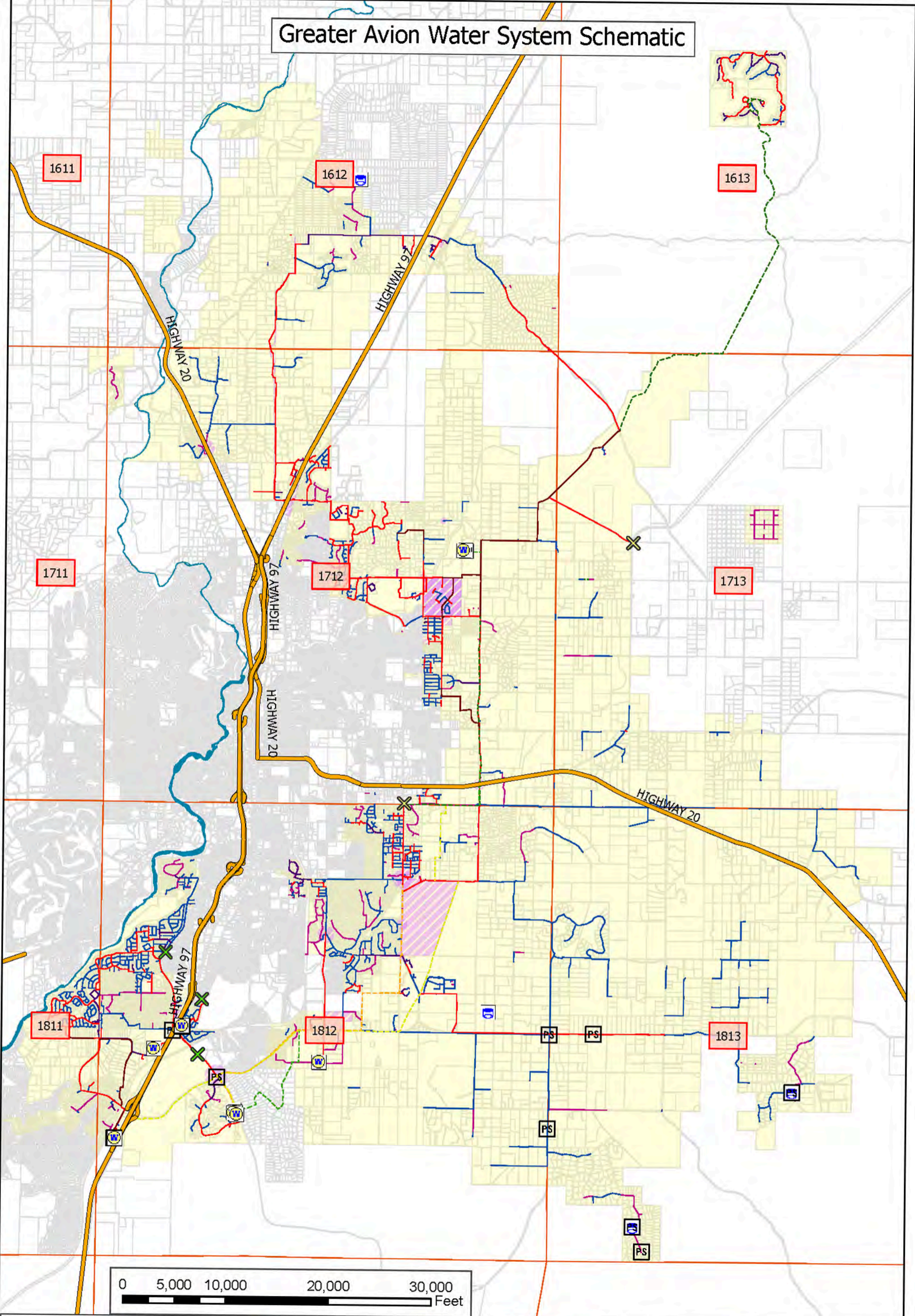
2021 Water Management and Conservation Plan – Avion Water Company

Greater Avion Water Service Territory



- Township_Range
- AVION SERVICE TERRITORY
- State_Highway

Greater Avion Water System Schematic



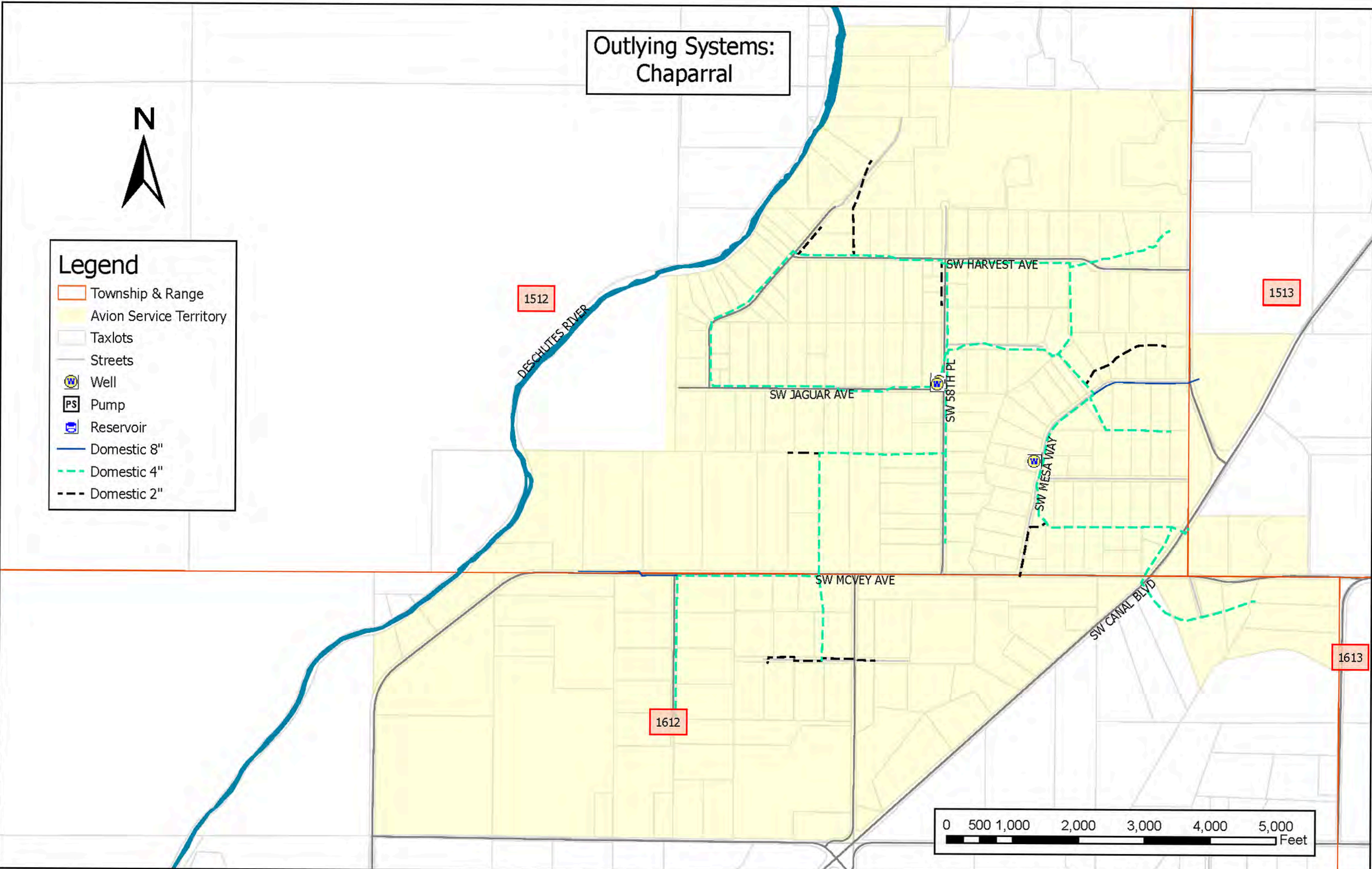
- | | | | | |
|-------------------------|-----------------------|--------------|--------------|-----------|
| Township & Range | State Route | Domestic 20" | Domestic 12" | Well |
| Avion Service Territory | City of Bend Intertie | Domestic 18" | Domestic 10" | Pump |
| Future Development | Roats Intertie | Domestic 16" | Domestic 8" | Reservoir |
| Taxlots | Domestic 24" | Domestic 14" | Domestic 6" | |

Outlying Systems: Chaparral

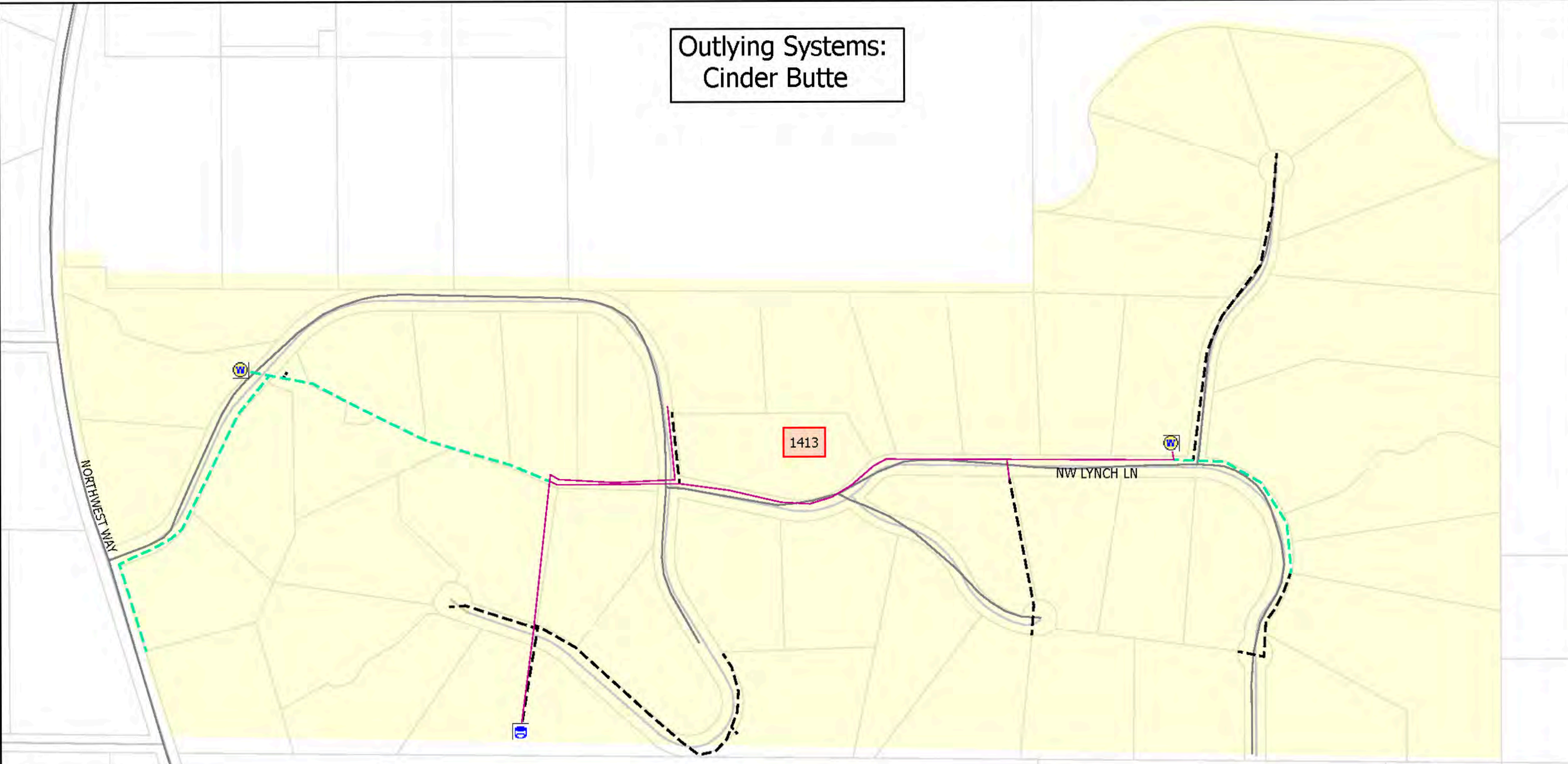


Legend

- Township & Range
- Avion Service Territory
- Taxlots
- Streets
- Well
- Pump
- Reservoir
- Domestic 8"
- Domestic 4"
- Domestic 2"

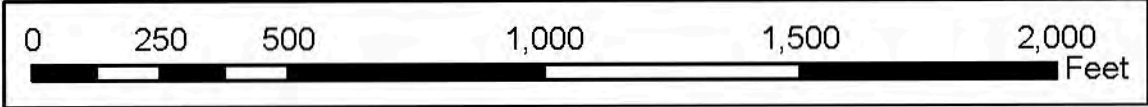


Outlying Systems: Cinder Butte

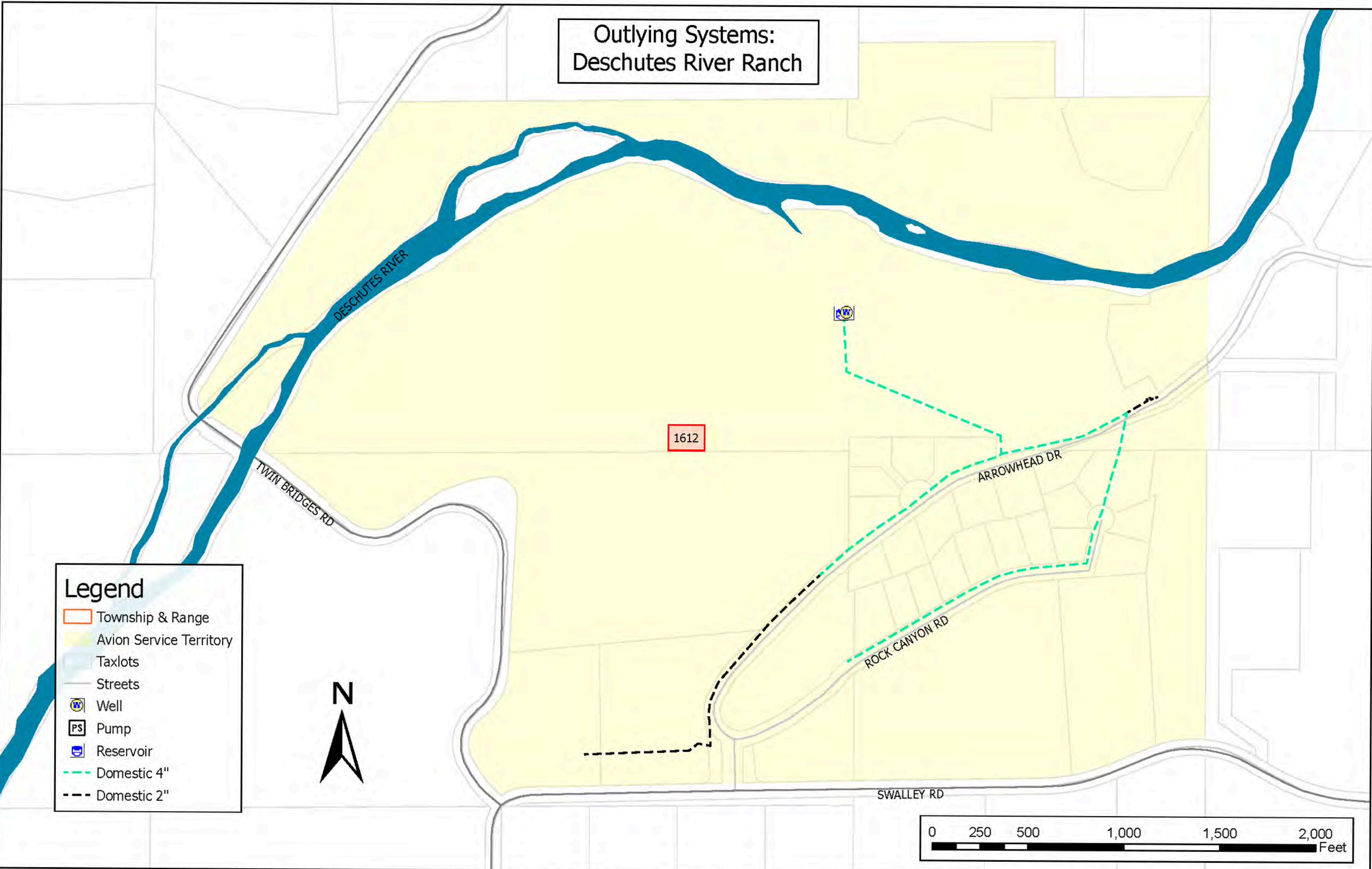


Legend

Township & Range	Pump
Avion Service Territory	Reservoir
Taxlots	Domestic 6"
County Roads	Domestic 4"
Streets	Domestic 2"
Well	

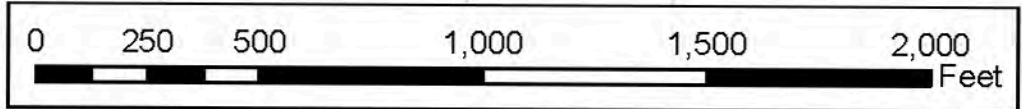


Outlying Systems: Deschutes River Ranch



Legend

- Township & Range
- Avion Service Territory
- Taxlots
- Streets
- Well
- Pump
- Reservoir
- Domestic 4"
- Domestic 2"

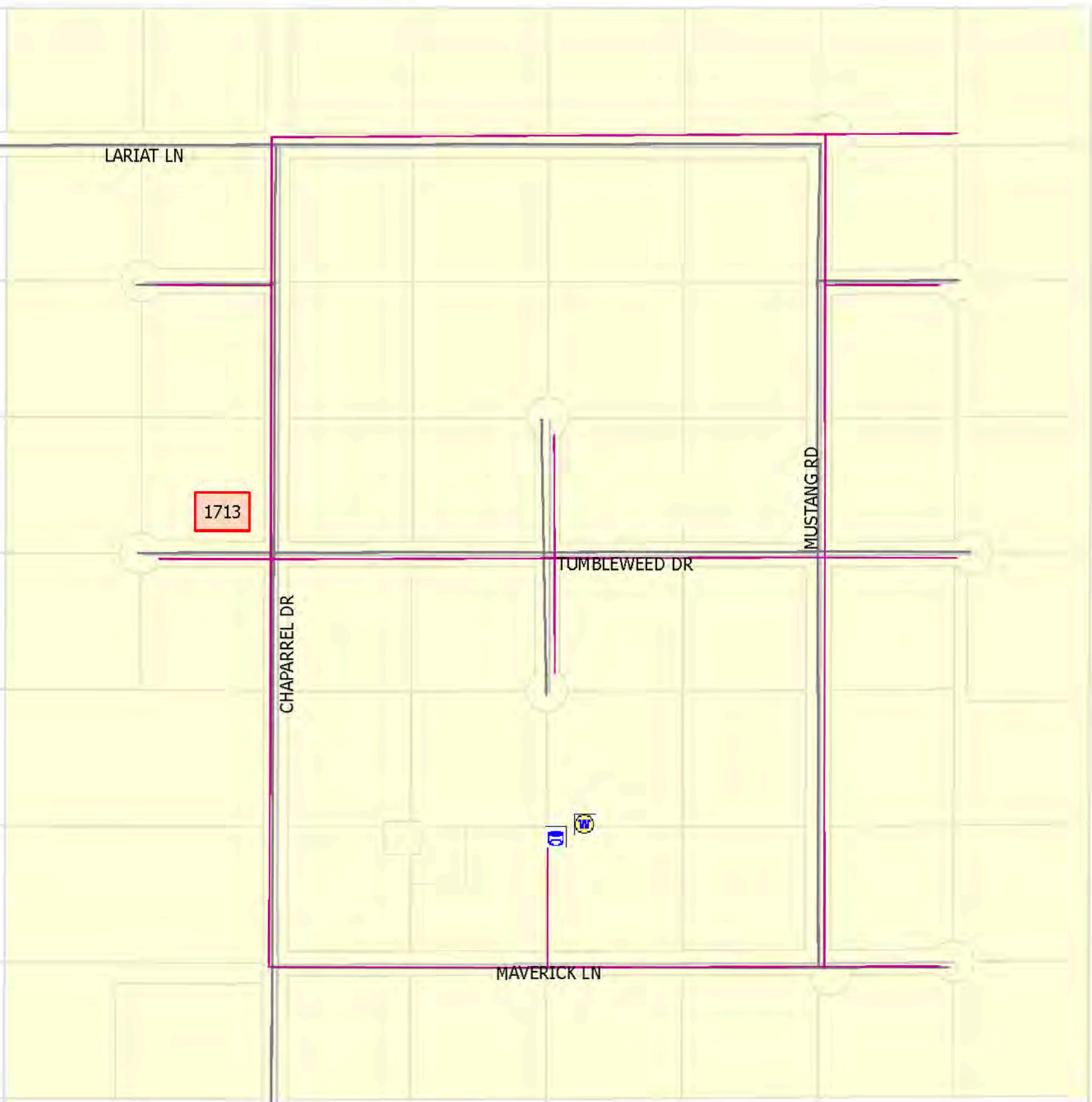
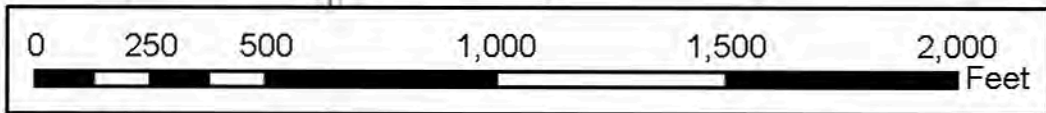


Outlying Systems: Desert Springs

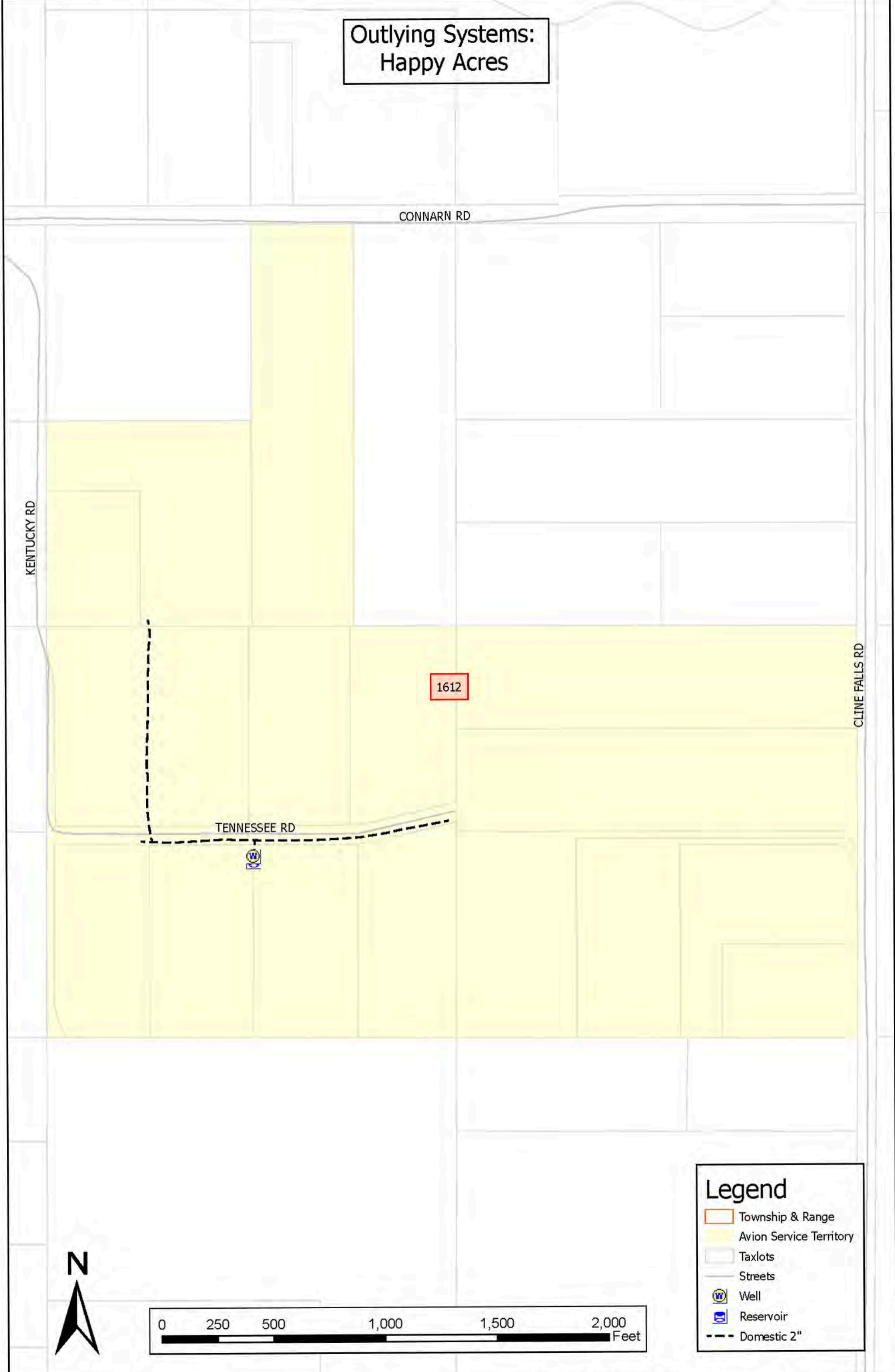


Legend

- Township & Range
- Avion Service Territory
- Taxlots
- Streets
- Well
- Pump
- Reservoir
- Domestic 6"

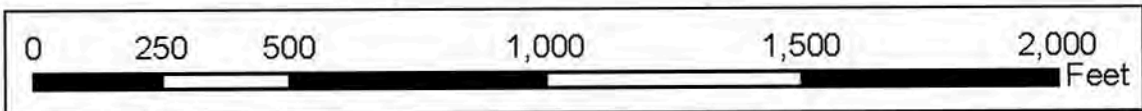


Outlying Systems: Happy Acres

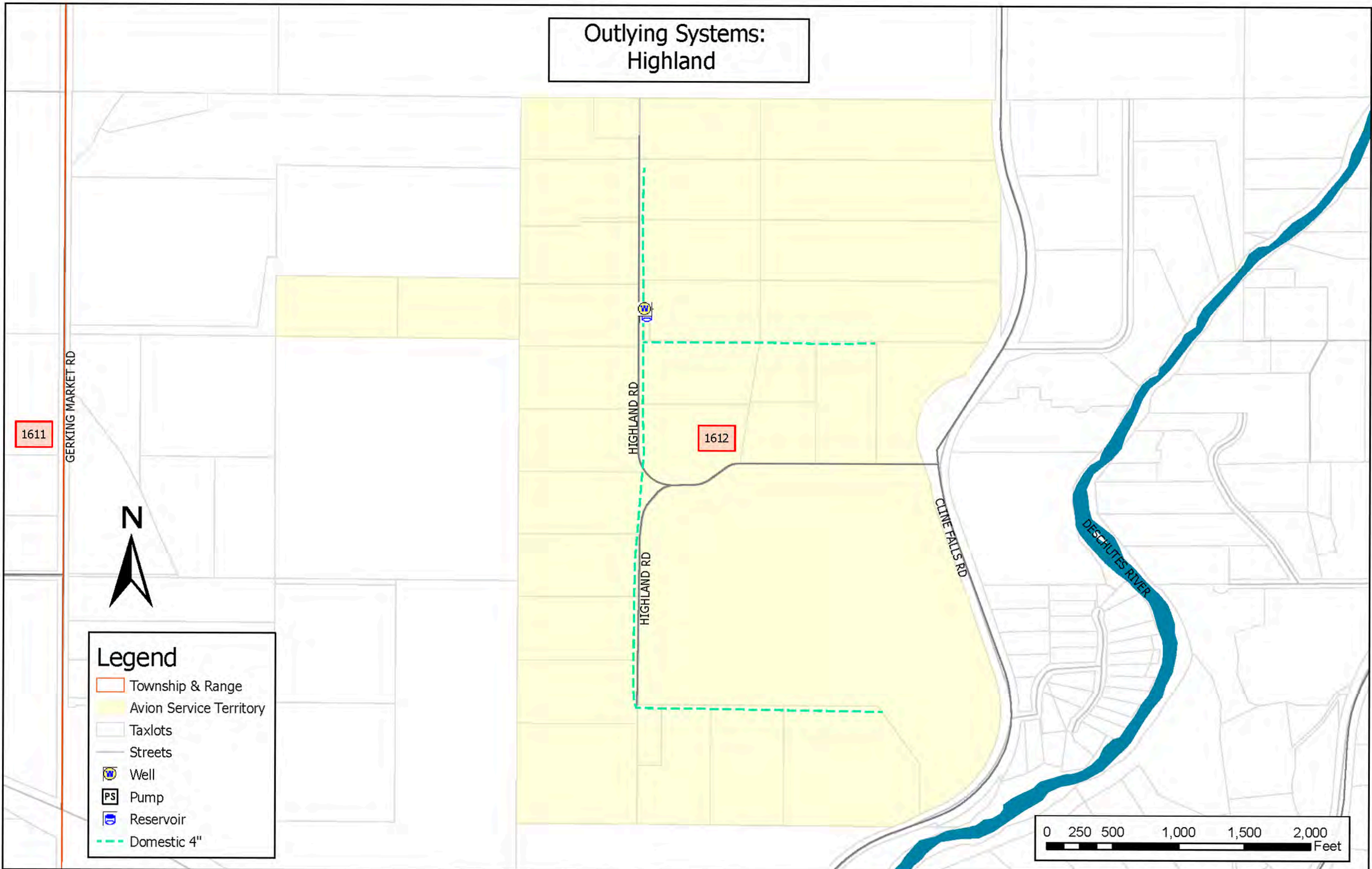


Legend

- Township & Range
- Avion Service Territory
- Taxlots
- Streets
- Well
- Reservoir
- Domestic 2"

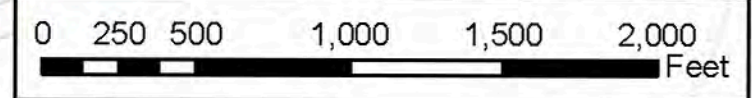


Outlying Systems: Highland

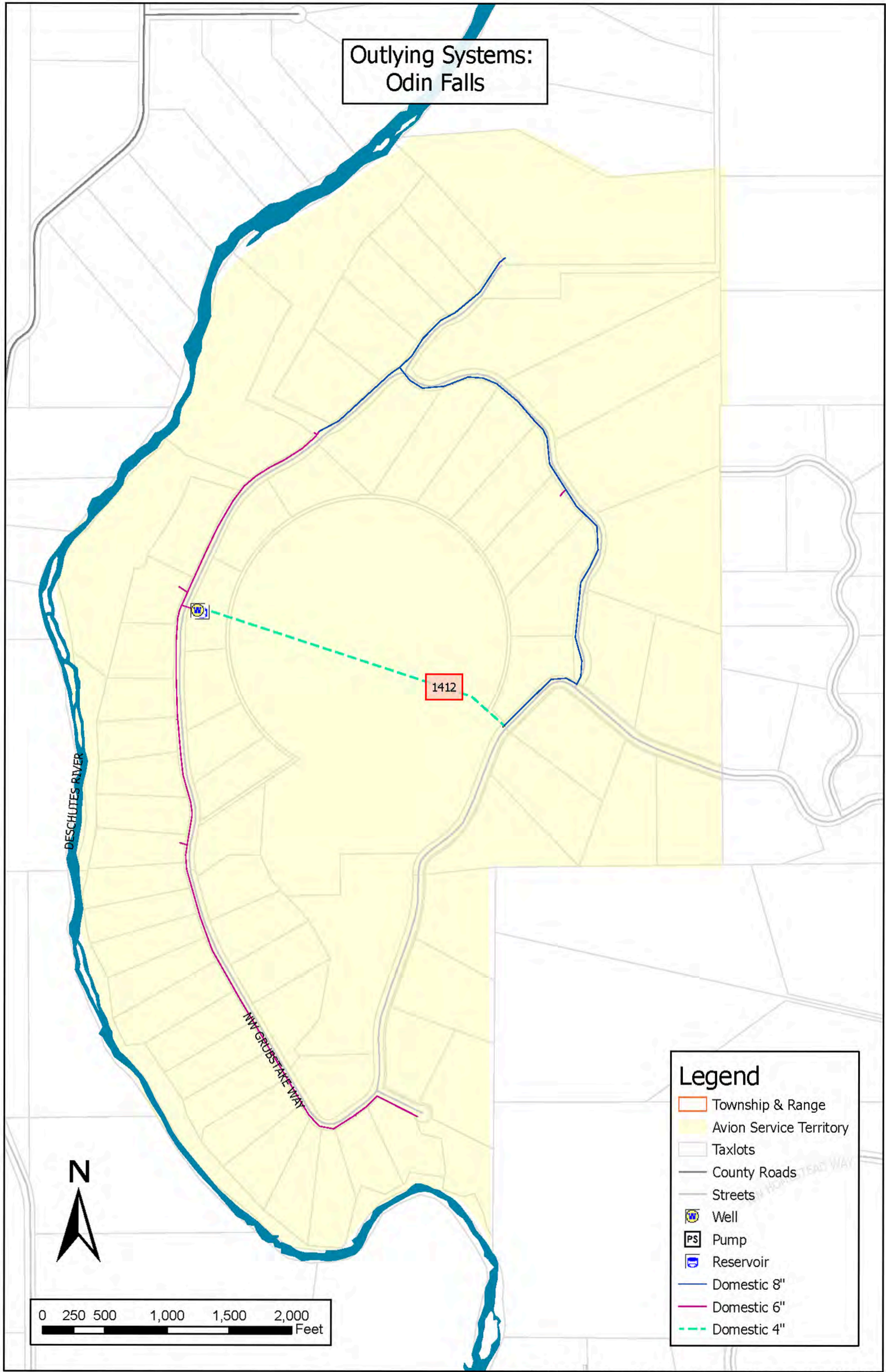


Legend

- Township & Range
- Avion Service Territory
- Taxlots
- Streets
- Well
- Pump
- Reservoir
- Domestic 4"



Outlying Systems:
Odin Falls



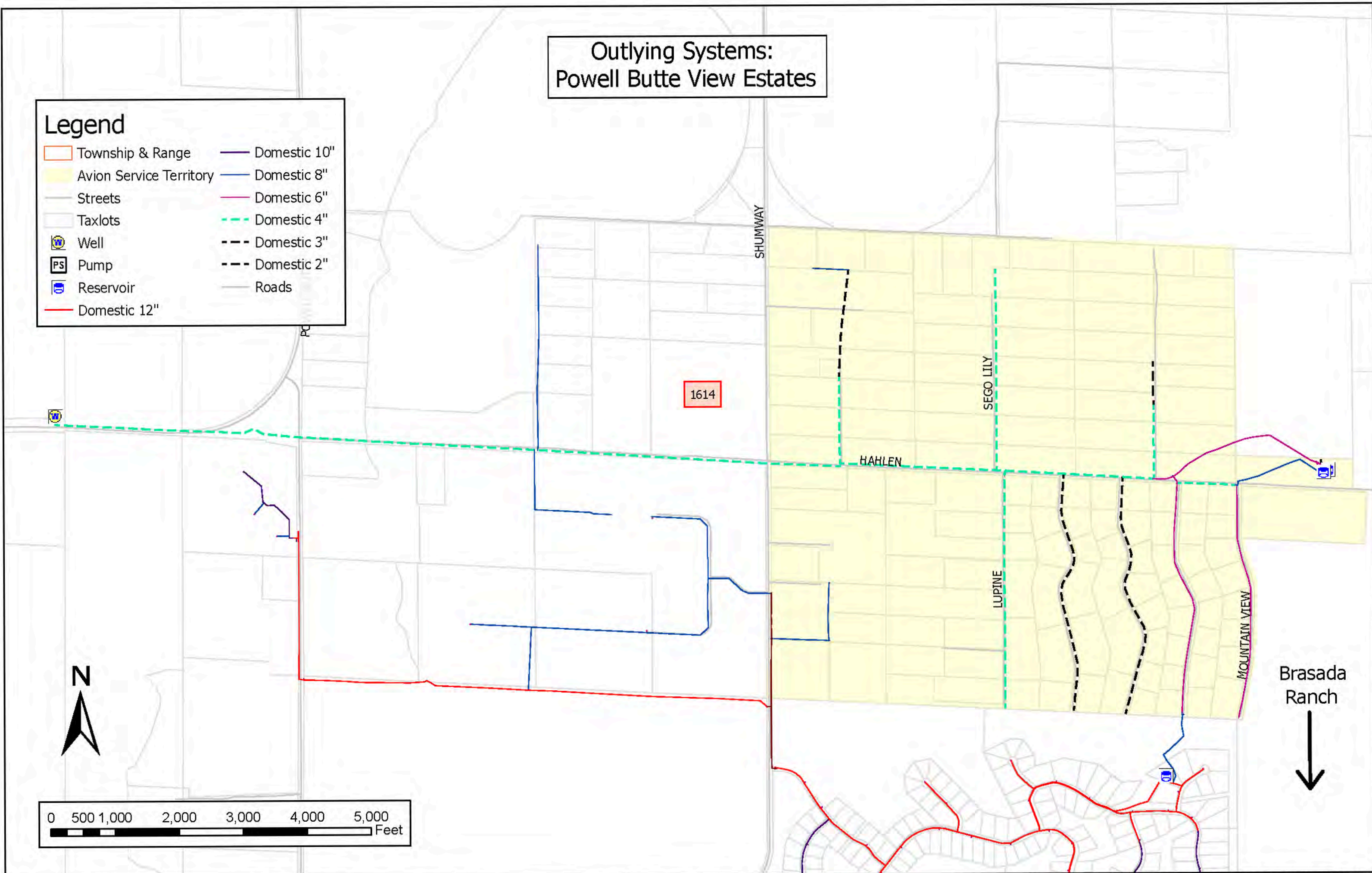
Legend

- Township & Range
- Avion Service Territory
- Taxlots
- County Roads
- Streets
- Well
- Pump
- Reservoir
- Domestic 8"
- Domestic 6"
- Domestic 4"

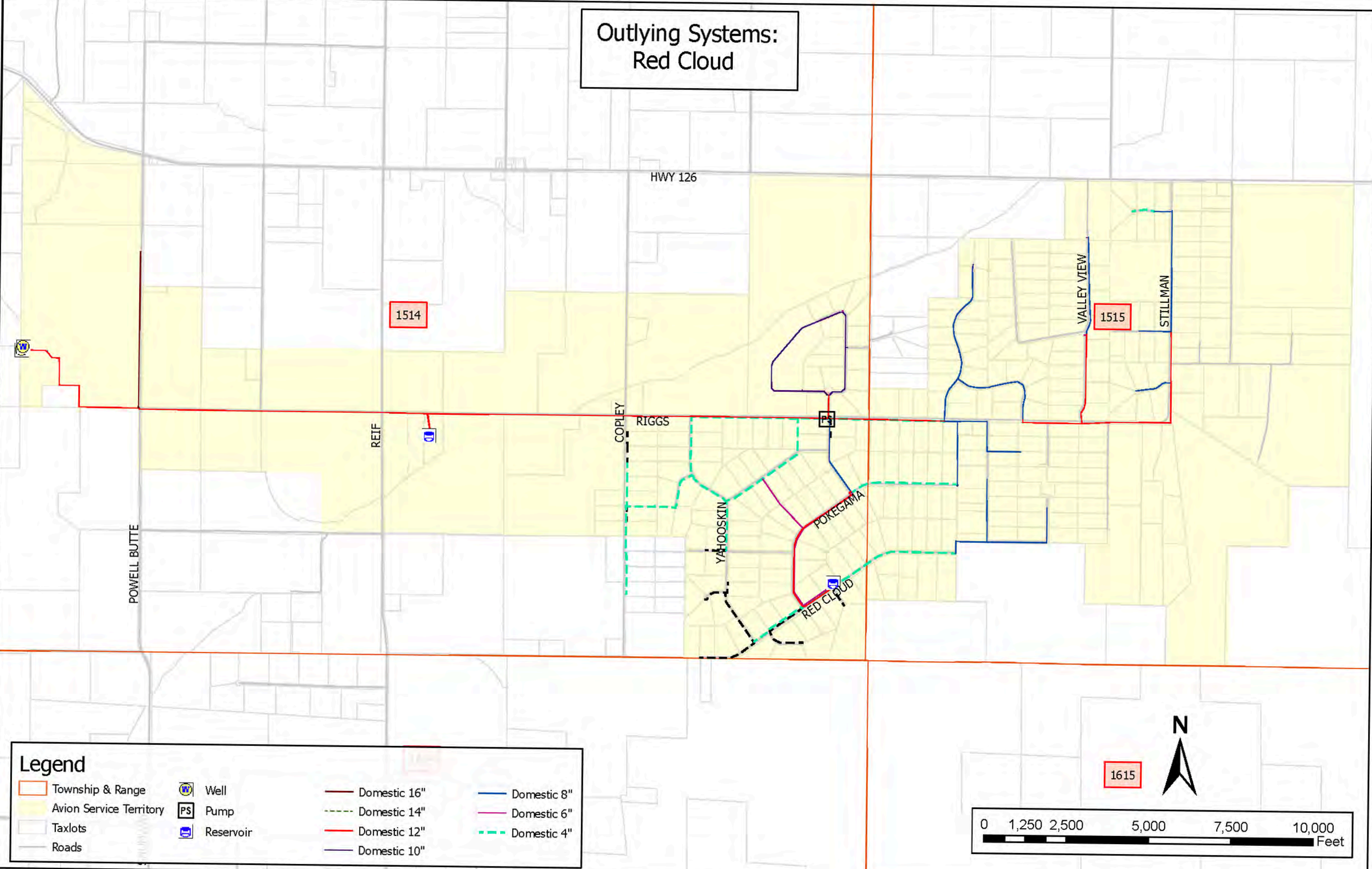
Outlying Systems: Powell Butte View Estates

Legend

Township & Range	Domestic 10"
Avion Service Territory	Domestic 8"
Streets	Domestic 6"
Taxlots	Domestic 4"
Well	Domestic 3"
Pump	Domestic 2"
Reservoir	Roads
Domestic 12"	



Outlying Systems: Red Cloud



Legend

Township & Range	Well	Domestic 16"	Domestic 8"
Avion Service Territory	Pump	Domestic 14"	Domestic 6"
Taxlots	Reservoir	Domestic 12"	Domestic 4"
Roads		Domestic 10"	

1615

N

0 1,250 2,500 5,000 7,500 10,000 Feet

Outlying Systems: South Redmond Heights

SW 35TH ST

SW XERO AVE

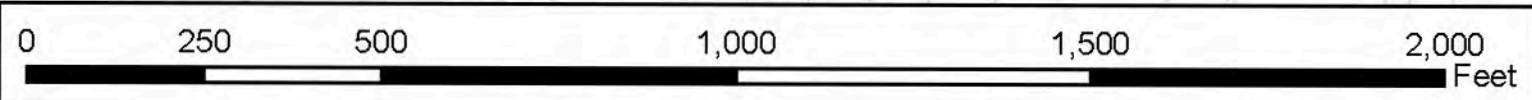
SW 34TH ST

SW YEW AVE

1513

SW 35TH ST

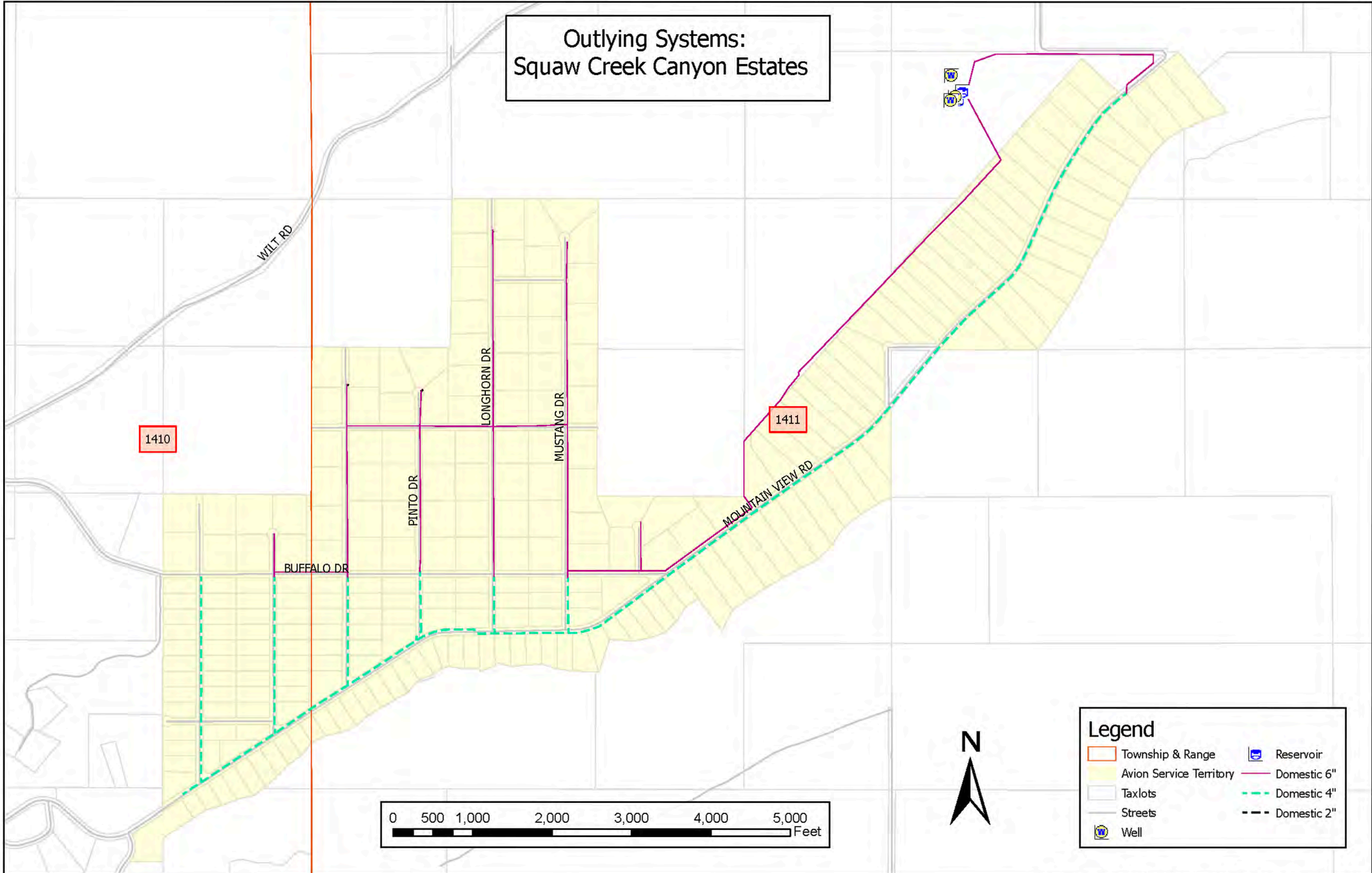
SW ANTELOPE AVE



Legend

- Township & Range
- Avion Service Territory
- Taxlots
- Streets
- W Well
- R Reservoir
- Domestic 8"
- Domestic 6"
- Domestic 2"

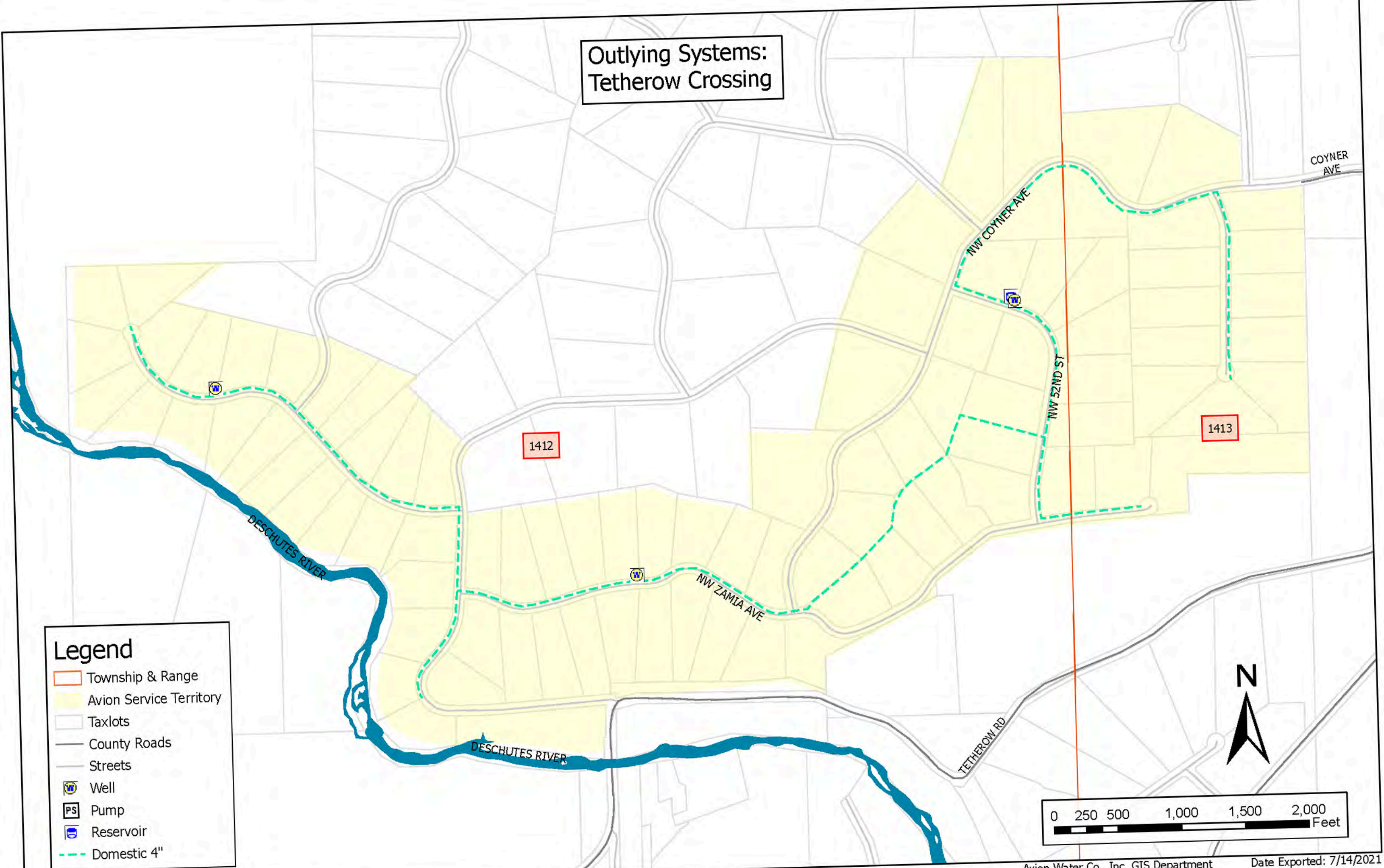
Outlying Systems: Squaw Creek Canyon Estates



Legend

Township & Range	Reservoir
Avion Service Territory	Domestic 6"
Taxlots	Domestic 4"
Streets	Domestic 2"
Well	

Outlying Systems: Tetherow Crossing



Legend

- Township & Range
- Avion Service Territory
- Taxlots
- County Roads
- Streets
- Well
- Pump
- Reservoir
- Domestic 4"

Outlying Systems: Tumalo Rim

1611

1612

1711

1712

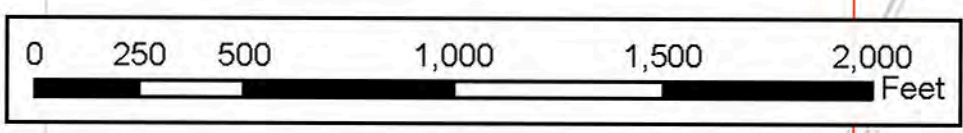
TUMALO RESERVOIR RD

TUMALO RIM DR

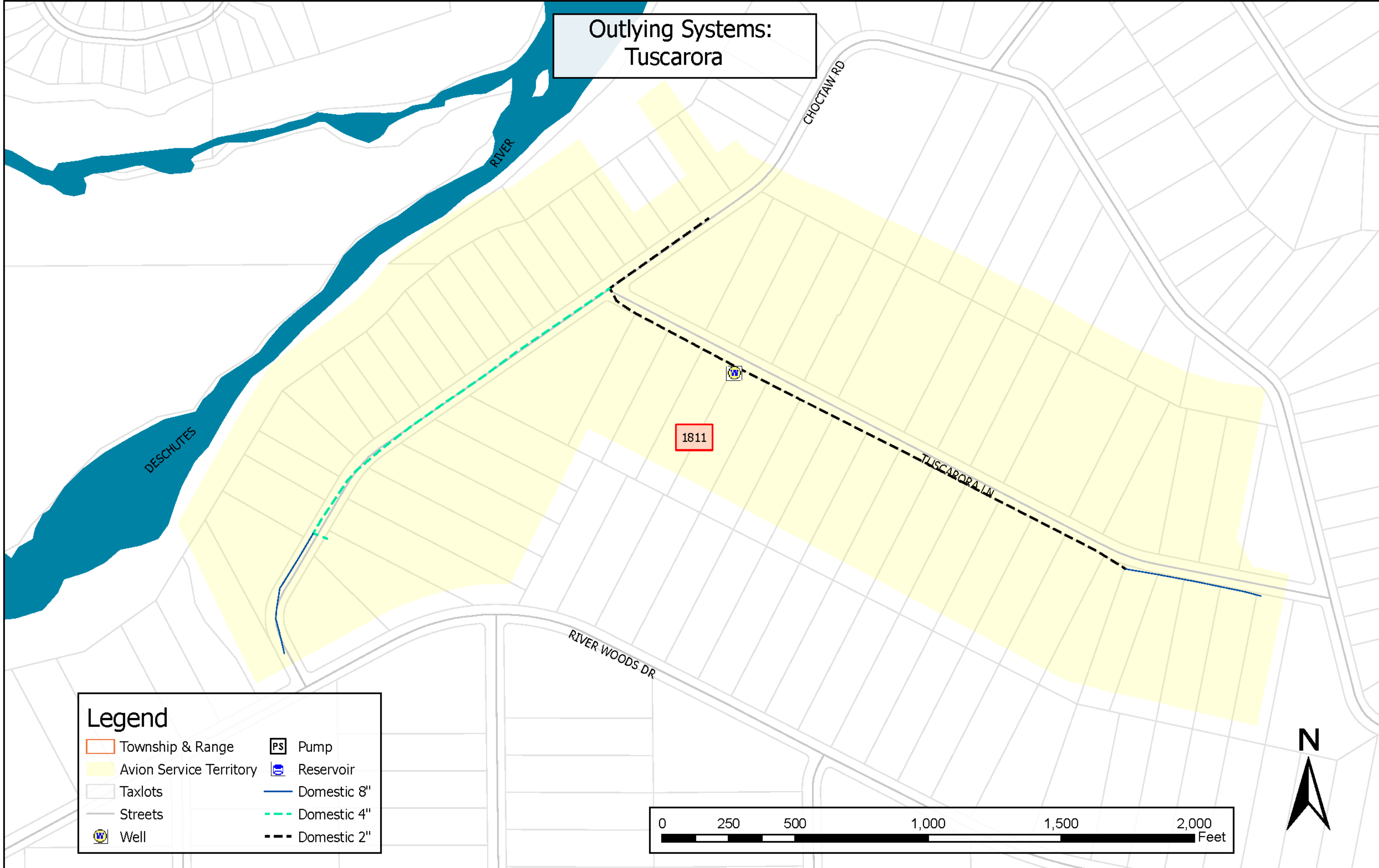
JOHNSON RD

Legend

- Township & Range
- Avion Service Territory
- Streets
- Taxlots
- Well
- Pump
- Reservoir
- Domestic 6"
- Domestic 4"

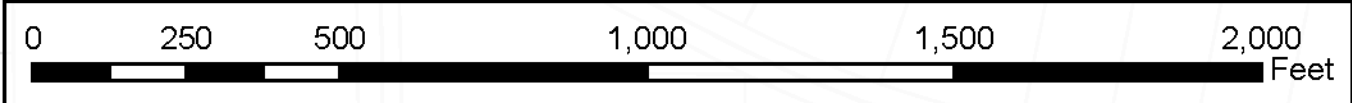


Outlying Systems:
Tuscarora



Legend

Township & Range	Pump
Avion Service Territory	Reservoir
Taxlots	Domestic 8"
Streets	Domestic 4"
Well	Domestic 2"

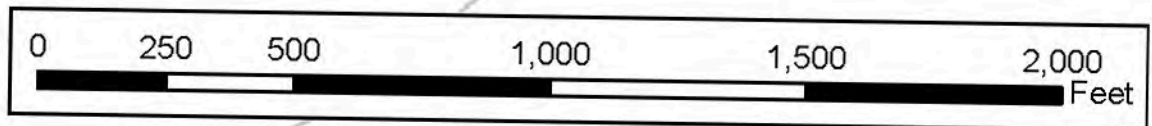


Outlying Systems: Wild River



Legend

- Township & Range
- Avion Service Territory
- Streets
- Taxlots
- W Well
- PS Pump
- Reservoir
- Domestic 6"
- Domestic 4"
- Domestic 2"



Appendix B

Public Education Examples

2021 Water Management and Conservation Plan – Avion Water Company

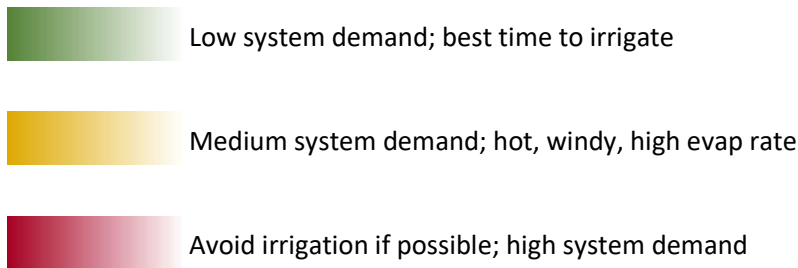
AVION 2021 DOMESTIC IRRIGATION HOURS

Avion is requesting an odd/even watering schedule for our customers. This means odd house numbers water on odd days and even houses water on even days. Watering is allowed for all addresses on the 31st.

Not applicable to customers using pressurized canal water such as Arnold, Swalley, or Central Oregon Irrigation Districts.

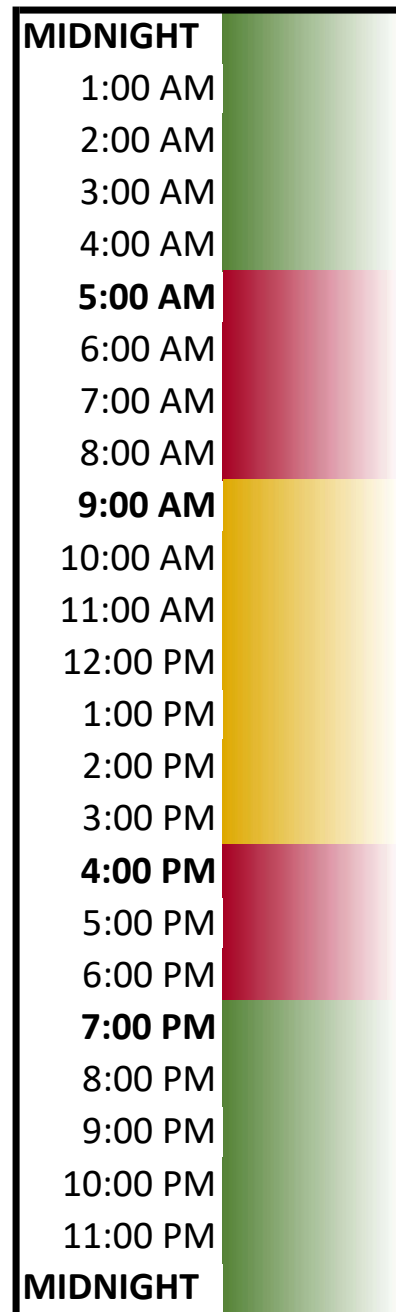
Please avoid irrigation between 5:00 am and 9:00 am; and between 4:00 pm and 7:00 pm due to high system demand.

Watering between 9:00 am and 4:00 pm is less efficient due to higher evaporation rates.



Please contact Avion Water Company at 541-382-5342 with any questions.

Effective as of 6/1/21





Winterization- Every year customers in Central Oregon experience problems due to improper winterization of their home and landscape water systems. The following recommendations can help ensure you avoid these problems:

- Remove garden hoses from outside faucets and install an insulated cover on faucets. This will help minimize the chance of domestic lines freezing and rupturing.
- Ensure foundation vent covers are closed and insulated. This helps prevent piping under the house from freezing and rupturing.
- If you have installed heat tapes on exposed water pipes, check to be sure they are working.
- Never attempt to thaw your meter or backflow device. If you believe either is frozen please contact Avion and we will address the problem.
- Look for your main shut-off valve, usually located where the water pipe enters the house. If you do not have a main shut off valve, install one in case of emergency.
- Blowout sprinkler systems. For best results, we offer the following recommendations:
 1. Use only properly trained, licensed professional landscapers for sprinkler blowouts.
 2. The maximum air pressure used for blowouts should be 30-40 psi.
 3. Do not connect the compressor upstream of the backflow prevention device, or to any part of the backflow prevention device. This is never allowed and violators will be held liable for any damages.
 4. Do install a capped pipe for sprinkler blowouts downstream of the backflow prevention device, and in a place that can be isolated from your house.
 5. Do not blow out more than one zone at a time.
 6. The homeowner must ensure that the person doing the blowout uses the proper valves.

Appendix C

Letters to Local Governments

2021 Water Management and Conservation Plan – Avion Water Company

From: [Peter Gutowsky](#)
To: [Owen McMurtrey](#)
Cc: [Adam Jackson](#); [Jason Wick](#); [Adam Sussman](#)
Subject: RE: Avion Water Company Water Management and Conservation Plan - Local Government Review
Date: Wednesday, September 8, 2021 8:27:17 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)

Owen,

Thanks for the opportunity to review the WMCP. The Deschutes County Planning Division has no comments.



Peter Gutowsky, AICP | Planning Manager
DESCHUTES COUNTY COMMUNITY DEVELOPMENT
117 NW Lafayette Avenue | Bend, Oregon 97703
Tel: (541) 385-1709
  

Enhancing the lives of citizens by delivering quality services in a cost-effective manner.

From: Owen McMurtrey <OMcMurtrey@gsiws.com>
Sent: Friday, September 3, 2021 11:50 AM
To: Peter Gutowsky <Peter.Gutowsky@deschutes.org>
Cc: Adam Jackson <Adam@avionwater.com>; Jason Wick <jason@avionwater.com>; Adam Sussman <asussman@gsiws.com>
Subject: Avion Water Company Water Management and Conservation Plan - Local Government Review

You don't often get email from omcmurtrey@gsiws.com. [Learn why this is important](#)

[EXTERNAL EMAIL]

Hi Peter,

Avion Water Company has developed a Draft Water Management and Conservation Plan. Avion has prepared this plan to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department (OWRD).

Under these rules, a water supplier is required to make its draft plan available for review by each affected local government and seek comments relating to consistency with the local governments' comprehensive land use plans.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your agency's Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. Please e-mail comments to me directly at: omcmurtrey@gsiws.com.

If you have any questions, please feel free to contact me at 541-257-9005 or at 541-740-5619. Thank you.

Sincerely,

Owen McMurtrey

Water Resources Consultant

direct: 541.257.9005 | mobile: 541.740.5619

1600 SW Western Boulevard, Suite 240, Corvallis, OR 97333

GSI Water Solutions, Inc. | www.gsiws.com

Please note: GSI is open for business, although most of us are working remotely. I'm available by phone or email, as always.

From: [Owen McMurtrey](#)
To: [Will VanVactor](#)
Cc: [Plan](#); [Adam Sussman](#); [Adam Jackson](#)
Subject: RE: Avion Water Company Water Management and Conservation Plan - Local Government Review
Date: Wednesday, October 6, 2021 5:15:00 PM

Hi Will,

Sorry for the delayed response. Thanks for the comments. I've updated the WMCP with a statement in section 5 identifying that Avion may seek new water rights as a result of acquiring existing small water systems or through agreements with new planned developments within the (10 year) term of this WMCP. It's my understanding that Avion does not currently have plans to serve any of the destination resorts for which there was previously an agreement, nor does Avion currently project a significant increase in demand that would justify Avion seeking new water rights for its satellite systems (except for SCCE in Deschutes County). I do think it's a good idea to include the general caveat that Avion often acquires or becomes the operator of small water systems, including on short notice, so while Avion is not currently projecting significant increases in demand that would justify Avion seeking new water rights at this time (with the exception of SCCE and the Greater Avion system), this leaves the door open for Avion to seek new water rights as a result of new systems coming under Avion's management.

Here's the text I've added:

Within the term of this WMCP, it is possible that Avion will seek new water rights as a result of acquiring existing small water systems, or through agreement with new planned developments that Avion currently does not serve. However, Avion has no plan to submit new water right permit applications for new water systems in addition to those identified in Table 2.2 at this time.

Let me know if you have any questions about the added text.

Thanks,

Owen McMurtrey

Water Resources Consultant

direct: 541.257.9005 | mobile: 541.740.5619

1600 SW Western Boulevard, Suite 240, Corvallis, OR 97333

GSI Water Solutions, Inc. | www.gsiws.com

Please note: GSI is open for business, although most of us are working remotely. I'm available by phone or email, as always.

From: Will VanVactor [mailto:Will.VanVactor@co.crook.or.us]

Sent: Thursday, September 30, 2021 3:16 PM

To: Owen McMurtrey <OMcMurtrey@gsiws.com>

Cc: Plan <Plan@co.crook.or.us>

Subject: Re: Avion Water Company Water Management and Conservation Plan - Local Government Review

Hi Owen,

Thanks for the taking the time this afternoon to discuss the Avion's draft WMCP. Below are my comments.

As we discussed, the two existing satellite systems in Crook County (Red Cloud and Powell Butte Vistas) will likely see continued infill, but I believe you have taken that into account in your demand projections.

Of note, a recent subdivision named Grandview (near Brasada Ranch and Powell Butte Vistas) is served by Avion. Our land use approval reflects that the lots will be served by personal wells, but I understand that after our land use approval was issued, the developer worked out a deal with Avion. The first phase of the subdivision is being built out and the plat for the second phase will be recorded in October. If we can provide you information regarding the number of lots, etc., please let me know.

Also of note, I believe Avion previously had arrangements with 2 or 3 destination resorts in Powell Butte to provide water. I understand that Avion no longer intends to serve at least one of these resorts (but we aren't always privy to developers' or Avion's current plans). The land use approvals for those destination resorts were granted over 10 years ago, but these destination resorts have either recently received modification approval or plan to see seek modification approval in the near future. Thus, we are likely to see additional development over the next ten years in Powell Butte. However, if Avion no longer intends to serve those resorts, this may be moot for the WMCP. If I can provide you any information regarding land use status of the resorts or any other pertinent information, let me know.

Please let me know if you have any questions or if I can provide you any additional information. Again, I appreciated your time this afternoon. Thank you.

Will Van Vactor

Director - Crook County Community Development
300 NE 3rd Street Room 12, Prineville, OR 97754

Office: (541) 447-3211

Website: www.co.crook.or.us

From: Owen McMurtrey <OMcMurtrey@gsiws.com>

Sent: Friday, September 3, 2021 12:30 PM

To: Plan <Plan@co.crook.or.us>

Cc: Adam Jackson <Adam@avionwater.com>; Jason Wick <jason@avionwater.com>; Adam Sussman <asussman@gsiws.com>

Subject: Avion Water Company Water Management and Conservation Plan - Local Government Review

To whom it may concern:

Avion Water Company has developed a Draft Water Management and Conservation Plan. Avion has prepared this plan to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department (OWRD).

Under these rules, a water supplier is required to make its draft plan available for review by each affected local government and seek comments relating to consistency with the local governments' comprehensive land use plans. As shown in the Greater Avion Water Service Area map and water system schematics in Appendix A, Avion's water service area is located primarily in Deschutes County. Of the water systems identified in this plan, which are those for which Avion is the operator and holder of water rights, only the Powell Butte View Estates and Red Cloud water systems are located in Crook County.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your agency's Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. Please e-mail comments to me directly at: omcmurtrey@gsiws.com.

If you have any questions, please feel free to contact me at 541-257-9005 or at 541-740-5619. Thank you.

Sincerely,

Owen McMurtrey

Water Resources Consultant

direct: 541.257.9005 | mobile: 541.740.5619

1600 SW Western Boulevard, Suite 240, Corvallis, OR 97333

GSI Water Solutions, Inc. | www.gsiws.com

Please note: GSI is open for business, although most of us are working remotely. I'm available by phone or email, as always.

CONFIDENTIALITY NOTICE - This e-mail may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. If you are not the addressee or it appears from the context or otherwise that you have received this e-mail in error, please advise me immediately by reply e-mail, keep the contents confidential, and immediately delete the message and any attachments from your system.

From: [Owen McMurtrey](#)
To: Deborah.McMahon@redmondoregon.gov
Cc: [Adam Jackson](#); [Jason Wick](#); [Adam Sussman](#)
Subject: Avion Water Company Water Management and Conservation Plan - Local Government Review
Date: Friday, September 3, 2021 12:20:00 PM
Attachments: [Avion_2021_WMCP_Local_Government_Review_Draft.pdf](#)

Hi Deborah,

Avion Water Company has developed a Draft Water Management and Conservation Plan. Avion has prepared this plan to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department (OWRD).

Under these rules, a water supplier is required to make its draft plan available for review by each affected local government and seek comments relating to consistency with the local governments' comprehensive land use plans. As shown in the water system schematics in Appendix A, the only water system that Avion owns and operates within the City of Redmond UGB is the South Redmond Heights water system.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your agency's Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. Please e-mail comments to me directly at: omcmurtrey@gsiws.com.

If you have any questions, please feel free to contact me at 541-257-9005 or at 541-740-5619. Thank you.

Sincerely,

Owen McMurtrey

Water Resources Consultant

direct: 541.257.9005 | mobile: 541.740.5619

1600 SW Western Boulevard, Suite 240, Corvallis, OR 97333

GSI Water Solutions, Inc. | www.gsiws.com

Please note: GSI is open for business, although most of us are working remotely. I'm available by phone or email, as always.

From: [Michael Buettner](#)
To: [Owen McMurtrey](#)
Cc: [Adam Sussman](#); [Patrick Griffiths](#)
Subject: RE: Avion WMCP Comments
Date: Monday, October 11, 2021 1:17:23 PM

Owen - Thank you for the opportunity to comment on Avion Water Company's 2021 Water Management and Conservation Plan.

The City of Bend supports Avion Water Company's commitment to providing quality water services to the citizens of Bend. As municipal water utilities it is important that we work together to ensure the foundational utility services are in place and adequately support our vibrant and growing community. In the near future, the City of Bend would like to meet to discuss methods that will ensure a consistent level of service is provided to customers regardless of water service provider.

Traditionally, the focus of coordination between Avion Water Company and the City of Bend has rightfully focused on water service area mapping and the transfer of utility billing data. In the future, additional focus should be placed on customer leak detection capabilities, emergency drinking water notifications, and future mitigation needs.

The City of Bend looks forward to continuing to make progress in these foundational utility areas and others in the near future.

From: [Owen McMurtrey](#)
To: cstephens@bendoregon.gov
Cc: [Adam Jackson](#); [Jason Wick](#); [Adam Sussman](#)
Subject: Avion Water Company Water Management and Conservation Plan - Local Government Review
Date: Friday, September 3, 2021 12:09:00 PM
Attachments: [Avion_2021_WMCP_Local_Government_Review_Draft.pdf](#)

Hi Colin,

Avion Water Company has developed a Draft Water Management and Conservation Plan. Avion has prepared this plan to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department (OWRD).

Under these rules, a water supplier is required to make its draft plan available for review by each affected local government and seek comments relating to consistency with the local governments' comprehensive land use plans. As shown in the Greater Avion Water Service Area map and water system schematics in Appendix A, Avion's water service area includes land within and outside the City of Bend urban growth boundary.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your agency's Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. Please e-mail comments to me directly at: omcmurtrey@gsiws.com.

If you have any questions, please feel free to contact me at 541-257-9005 or at 541-740-5619. Thank you.

Sincerely,

Owen McMurtrey

Water Resources Consultant

direct: 541.257.9005 | mobile: 541.740.5619

1600 SW Western Boulevard, Suite 240, Corvallis, OR 97333

GSI Water Solutions, Inc. | www.gsiws.com

Please note: GSI is open for business, although most of us are working remotely. I'm available by phone or email, as always.



Oregon

Kate Brown, Governor

Public Utility Commission

201 High St SE Suite 100

Salem, OR 97301-3398

Mailing Address: PO Box 1088

Salem, OR 97308-1088

503-373-7394

December 21, 2022



BY EMAIL

Avion Water Company

adam@avionwater.com

RE: Advice No. 22-04

The tariff sheets in your December 20, 2022, compliance filing docketed in UW 193, are accepted in compliance with Order No. 22-463. Attached is a receipted copy of the sheets in your compliance filing for your records.

/s/ Nolan Moser

Nolan Moser

Chief Administrative Law Judge

Public Utility Commission of Oregon

503-689-3622

**Containing Rules and Regulations
Governing Water Utility Service**

NAMING RATES FOR

Avion Water Company, Inc.

(name of utility)

60813 Parrell Road

(address)

Bend, Oregon 97702

(city, state, & zip code)

541-382-5342 (telephone)
541-382-5390 (fax)

(telephone numbers and type)

Serving water in the vicinity of

Parts of Deschutes & Crook Counties, Oregon

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

TABLE OF CONTENTS

<u>Schedule No.</u>		<u>Sheet No.</u>
	Title Page	1
	Table of Contents	2
1	Residential & Commercial Metered Rates	3
2	Irrigation Delivery Rates	4
3	Miscellaneous Service Charges	5
4	Fire Service Rates	7
5	Commercial Water Haulers	8
6	Equal Payment Plan	9
7	AWWA Multiplier	10
8	Reserved for Future Use	11
9	Commodity Power Cost Adjustment	12
10	Cross Connection Prevention Program	14
11	Deschutes River Restoration Tariff	16
12	Woodriver Village Tariff	17
13	Nottingham Irrigation Customers	18
14	Interruptible Large Irrigation Customers	19
15	West Pilot Butte Airport Tariff – System Impact Fee	20
16	Tax Cuts And Jobs Act Deferral Compliance Filing	23
17	Pressurized Irrigation Supplementation Test Tariff	24
18	Reserved for Future Use	25-34

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 1

RESIDENTIAL AND COMMERCIAL METERED RATES

AVAILABLE: To customers of the Company in the areas of Crook and Deschutes Counties.

APPLICABLE: To all customers (excluding irrigation service and fire service).

BASE RATE

Service Meter Size	Monthly Base Rate	Usage Allowance
5/8 inch	\$28.52	None
3/4 inch	\$42.77	None
1 inch	\$71.29	None
1 ½ inches	\$142.58	None
2 inches	\$228.12	None
3 inches	\$427.73	None
4 inches	\$712.88	None
6 inches	\$1,425.77	None
8 inches	\$2,281.23	None

COMMODITY RATE

Commodity Rate	Per	Number Of Units	Unit Of Measure	Base Usage Allowance	Unit Of Measure
\$1.01	Per	100	Cubic Feet	None	Cubic Feet

SPECIAL PROVISIONS:

1. Water used during the construction of buildings, etc., shall be metered, whenever practical. Charges shall be made at the rates specified in this schedule. When setting of a meter is impractical, the amount of water used shall be estimated, and the charges shall be made at specified rates for the amounts so estimated.
2. City of Bend residents will be charged a monthly City franchise fee based off of a monthly total of all accounts recognized by the Oregon P.U.C. to set Avion's rates.
3. These rates are based on continuous service. Discontinuation of service may not be employed to avoid monthly charges for service. See Rule No. 27, Voluntary Discontinuance.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 2

IRRIGATION DELIVERY RATES

AVAILABLE: To all irrigation customers of the Utility in Deschutes County whose irrigation water source is Arnold, Swalley, or Central Oregon Irrigation Districts.

APPLICABLE: To those irrigation customers who have water rights adjudicated to the land for which the Utility has facilities to deliver the water under pressure to the customer's land.

BILLING PERIOD: Monthly rates for irrigation service are charged throughout the year. The same customer disconnection and reconnecting irrigation service within the same twelve month period will be billed for continuous service at the time of reconnection.

IRRIGATION BASE AND VARIABLE RATES

Water Delivery Charge Base Rate per Month	\$12.87 per customer premise
Water Delivery Charge Variable Rate per Month	\$8.24 per acre feet of water right adjudicated to the customer's premise
Irrigation Water Assessment	"At Cost"

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 3

MISCELLANEOUS SERVICE CHARGES

This schedule lists the miscellaneous charges included in the Utility's Rules and Regulations; refer to the appropriate rules for an explanation of charges and conditions under which they apply.

<u>Connection Charge for New Service</u> (Rules No. 8 & 9)	
Standard 3/4-inch service	At cost
Nonstandard 3/4-inch service	At cost
Larger than 3/4-inch	At cost
Irrigation hookup (if provided on separate system)	At cost
 <u>Meter Test</u> (Rules No. 19 & 20)	
First test within 12-month period	N/C
Second (and subsequent) test within 12-month period	\$50
 <u>Pressure Test</u> (Rule No. 40)	
First test within 12-month period	N/C
Second test within 12-month period	\$35
 <u>Late-Payment Charge</u> (Rule No. 21)	
Charged on amounts more than 30 days past due	Pursuant to OAR 860-036-1400
 <u>Deposit for Service</u> (Rule No. 5)	
	Pursuant to OAR 860-036-1220
 <u>Returned-Check Charge/ Non-Sufficient Funds Charge</u> (Rule No. 22)	
	\$25 each occurrence
 <u>Trouble-Call Charge</u> (Rule No. 36)	
During normal office hours	\$35 per hour (1 hour minimum charge)
After normal office hours on special request	\$50 per hour (1 hour minimum charge)
 <u>Disconnection/Reconnection Charge</u> (Rules No. 27, 28 & 29)	
During normal office hours	\$35 per occurrence
After normal office hours on special request	\$100 per occurrence
 <u>Unauthorized Restoration of Service</u> (Rule No. 31)	
	Reconnection charge plus costs
 <u>Damage/Tampering Charge</u> (Rule No. 26 & 29)	
	Repair/restoration cost + \$200
 <u>Field Visit Charge</u> (Rule No. 30)	
	\$35

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 3 (Continued)
MISCELLANEOUS SERVICE CHARGES

General Field Service Rates

Customer Hourly Rate \$50.00/hour plus materials
Non-customer Hourly Rate \$70.00/hour plus materials

Equipment Field Service Rates

Vac Trailer, Mini-Excavator, Skid Steer, Backhoe \$80.00/hour/machine
Rented equipment At cost

Credit Card Chargeback Transaction Fee

\$12.00 Chargeback transaction fee

(A Chargeback Transaction Fee applies only when a customer disputes a transaction but Visa/MasterCard finds it was an authorized transaction.)

Special Note: Avion's Visa/MasterCard transaction fees will vary according to the rates charged by Visa/MasterCard. Avion is required to provide 30 days written notice to the Oregon PUC of any changes in these charges prior to their taking effect.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 4

FIRE SERVICE RATES

AVAILABLE: To fire service customers of the Utility in the areas of Deschutes and Crook Counties, Oregon.

APPLICABLE: To fire service customers with privately-owned and maintained fire service lines connected to the Utility mains.

FIRE SERVICE BASE RATE PER MONTH

Fire Service Lines By Size	Rate
4 inch and smaller supply	\$38.42
6 inch supply	\$84.53
8 inch supply	\$146.01
10 inch supply	\$230.54
12 inch supply	\$330.44

FIRE HYDRANT MAINTENANCE RATES

AVAILABLE: To fire service customers of the Utility in the areas of Deschutes and Crook Counties, Oregon.

APPLICABLE: To premises with fire hydrants located on premises.

BASE CHARGE PER MONTH: Per hydrant per month: \$21.49.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 5

RATES FOR COMMERCIAL WATER HAULERS

AVAILABLE: To commercial water haulers in Deschutes and Crook Counties where the Utility’s facilities and excess capacity exist. Determination of adequacy of facilities and capacity is in the sole discretion of Avion Water Company, Inc. Each commercial water truck must be inspected by Avion and be equipped with a suitable hydrant meter, suitable backflow prevention devices (or air gap), chapman valve, and a fire hydrant wrench.

APPLICABLE: To all commercial water haulers.

COMMERCIAL WATER HAULERS MONTHLY RATE

\$1.47 per 100 cubic feet

SPECIAL PROVISIONS:

1. Truck meters must be presented at Avion’s office between the 15th and the 20th of each month. Bills for service are due in accordance with the tariff. Failure to present meter in accordance with this provision will be considered grounds for termination of service under Rule 19 of this Tariff.
2. Commercial water haulers detected not using meters or proper equipment may be denied service for one month for the first offense, and denied service completely for a second offense.
3. Commercial water haulers shall fill only from designated hydrants at designated times that have been determined by Avion to have excess capacity. Failure to comply with this requirement will be considered grounds for termination of service.
4. Continued use of Avion facilities following termination of service shall be considered theft of services under OAR 860-036-1590.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 6

EQUAL PAYMENT PLAN

AVAILABLE: To residential customers of Avion Water Company, Inc.

APPLICABLE: To residential customers of Avion Water Company, Inc.

EQUAL PAYMENT PLAN:

At the option of the customer, residential service billings may be rendered in equal monthly amounts provided the customer has satisfactory credit or account balances not exceeding the calculated equal monthly billing. At the Utility's option, the plan may be offered to commercial customers.

The Equal Payment Plan (EPP) shall consist of 12 equal monthly billings, based on an average actual cubic feet usage for the most recent 12 months billed at the current rates. Customers must have 12 months account history at the address to qualify for EPP. When rate schedules change, the EPP will be re-computed based on the new approved rates.

EPP accounts shall be reviewed after the first twelve months of billing and at least annually thereafter. During the annual review month, the actual accounts receivable balance (debit or credit) shall be incorporated into the estimate for the next 12 months on the EPP unless the customer requests that the account balance be settled at that time.

The EPP may be reviewed and amended by the Utility as needed in response to changing prices or variations in the customer's water usage.

Enrollment in the EPP may occur at any time. Customers may cancel their EPP by notifying the Utility and paying the total account balance. The Utility reserves the right to cancel a customer's EPP if they are delinquent on payment of the equal monthly billing.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 7

RESIDENTIAL UNIT EQUIVALENTS BY
 METER SIZE

AVAILABLE: To customers of the Utility in the areas of Crook and Deschutes Counties.

APPLICABLE: To developers of projects using the Utility’s water service that are not using Schedule 12 or 15.

RESIDENTIAL UNIT EQUIVALENTS BY SERVICE METER SIZE

Service Meter Size	AWWA Multiplier	Fee
5/8" x 3/4" inch	1	\$3,300
3/4 inch	1.5	\$4,950
1 inch	2.5	\$8,250
1 1/2 inch	5	\$16,500
2 inch	8	\$26,400
3-inch	15	\$49,500
4 inch	25	\$82,500
6 inch	50	\$165,000
8 inch	80	\$264,000
4 inch or smaller fire	2	\$6,600
6 inch or larger fire	4	\$13,200

SPECIAL PROVISIONS:

1. Multiple family projects are charged based upon meter size required.
2. Condominium projects or similar projects are charged based upon meter size per unit.
3. Multipliers are provided by the American Water Works Association (AWWA).

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 8

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 9

COMMODITY POWER COST ADJUSTMENT

Schedule No. 9 is an “Automatic Adjustment Clause” as defined in ORS 757.210.
It is subject to review by the Commission at least once every two years.

PURPOSE: To define procedures for periodic revision in rates due to changes in the Utility’s purchased commodity power cost, to describe how a rate change for purchased commodity power cost is calculated, and identify any other requirements.

APPLICABLE: The commodity power cost adjustment applies to the following schedules contained in the Utility’s tariffs: Schedules 1, 2, 4, and 5.

COMMODITY POWER COST ADJUSTMENT

Changes under the applicable schedules are subject to increases or decreases that may be made without prior hearing to reflect the changes in the Utility’s purchased power costs resulting from adjustments in the rate of the Utility’s power suppliers. Such adjustments may be shown in Schedule 1 and 2, or may be incorporated directly in the applicable rate schedules.

The Utility may file purchased power cost adjustments periodically to be effective upon the date its power suppliers implement rate changes. If the Utility chooses to file for power cost increases, it is obligated to file for decreases in power costs.

DESCRIPTION OF POWER COST ADJUSTMENT CALCULATION FOR DOMESTIC WATER

Current power rate per 100 cf of water, multiplied by the power provider’s percentage increase, multiplied by the power provider’s allocation, equals the power cost adjustment per 100 cf. For example, PacifiCorp provides 56.22 percent of the Utility’s electric power for domestic water. A 30 percent increase by PacifiCorp would result in the following power cost adjustment:

Current Power Rate	Percentage Increase	Allocation
\$0.2422	30%	0.5622

$\$0.2422 \times 0.30 \times 0.5622 = \0.041 increase per 100 cf.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

DESCRIPTION OF POWER COST ADJUSTMENT CALCULATION FOR IRRIGATION WATER

Current power rate per acre feet of water, multiplied by the percentage increase in power costs, multiplied by the power provider’s allocation, equals the power cost adjustment per acre foot of water. For example, PacificCorp provides 68.21 percent of Avion’s electric power for irrigation water. A 30 percent increase by PacifiCorp would result in the following:

Current Power Rate	Percentage Increase	Allocation
\$41.694	30%	0.682

$\$41.694 \times 0.30 \times 0.682 = \8.521 increase per acre foot of water

Similar calculation would be needed for each power supplier that changed its rates. The effect of these calculations would be a rolling forward current cost increase or decrease. Likewise, current power costs should be recalculated, providing a new basis for power cost at each future rate case to account for any changes in the distribution of power use among suppliers (a change in allocation). The Allocation index must be recalculated at two year intervals from the effective date of this schedule.

OTHER REQUIREMENTS

Avion shall, whenever possible, utilize its pumping operations at off-peak times in order to promote energy conservation. Avion will adopt a time-of-day usage of electric power from power suppliers who offer such a conservation tariff.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 10

CROSS CONNECTION CONTROL PROGRAM (PROGRAM) BACKFLOW PREVENTION DEVICE SERVICES AND FEES

PURPOSE: Avion Water Company offers its customers backflow prevention device/double check valve assembly (DCVA) testing, maintenance, and repair services (the Program).

AVAILABLE: To customers of Avion Water Company, Inc. (Avion), in Deschutes and Crook Counties, Oregon.

APPLICABLE: To residential and commercial/industrial premises with 1” or smaller DCVAs installed at the meter.

ENROLLMENT: Avion WILL ENROLL all customers with DCVAs installed at the meter in this Program UNLESS the customer signs an “OPT OUT” NOTICE and returns such notice to Avion.

PROGRAM DESCRIPTION

1. **TESTING SERVICE** – Avion will provide the required DCVA annual test by a state certified tester pursuant to Oregon Administrative Rules 333-061-0070 through OAR 333-061-0072.
2. **MAINTENANCE AND REPAIR SERVICE** – Avion will provide maintenance and repairs on customer-owned DCVAs installed at the meter. Maintenance does not include the start up, blow out, or other freeze protection of assemblies on irrigation systems. Replacement of DCVA is the responsibility of the customers and is not covered by Avion’s DCVA maintenance and repair services.

PROGRAM RATES

1. **ALL CUSTOMERS ENROLLED IN PROGRAM**
Monthly rate (itemized separately on customer water bill): \$2.76
2. **ALL CUSTOMERS WHO OPT OUT, BUT CHOOSE AVION AS A DEFAULT SERVICE SUPPLIER ON THEIR OPT OUT NOTICE**
At the time of annual testing, Avion will bill customers: \$45.00

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 10 (CONTINUED)

**CROSS CONNECTION CONTROL PROGRAM
BACKFLOW PREVENTION DEVICE SERVICES AND FEES**

OPT OUT CUSTOMERS WHO FAIL TO PROVIDE DCVA TEST RESULTS

OPT OUT customers who fail to provide Avion with annual DCVA test results by the customer's annual deadline will be disconnected from water service pursuant to OAR 860-036-1500 (DISCONNECTION PROCEDURES FOR ALL CUSTOMERS OF WATER UTILITY SERVICES) or OAR 860-036-1630 (EMERGENCY DISCONNECTION).

SPECIAL PROVISIONS:

1. The customer is under no obligation to use Avion's DCVA services.
2. The customer can choose any qualified company or individual to test, maintain, and repair his/her DCVA.
3. Avion will provide each customer with notification of the Program services being offered. The notification shall include a written Program refusal (OPT OUT NOTICE).
4. Customers who choose to OPT OUT of the Program must sign the written OPT OUT NOTICE and return it to the Company.
5. Customers who choose to OPT OUT of the Program are responsible for the annual testing, maintenance, repair, and replacement of their DCVAs.
6. Avion will notify each customer who OPTS OUT of the Program 30 days prior to the annual test results due date. Annual test results must be provided to Avion on or before the customers' annual deadlines.
7. Avion reserves the right to propose before the Public Utility Commission of Oregon any change in the amount charged for the Program services.
8. Customers will be given the choice of accepting or rejecting a new agreement in advance of any rate increase.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 11

**DESCHUTES RIVER RESTORATION PROGRAM VOLUNTARY RESIDENTIAL
AND COMMERCIAL METERED RATES**

AVAILABLE: To customers of the Company in the areas of Crook and Deschutes Counties who elect to participate in “Deschutes River Restoration” Program.

APPLICABLE: To all customers of Avion.

BASE RATES:

Rate Schedule

Participation Level	Monthly Mitigation Charge
A	\$1.60
B	\$3.20
C	\$4.80
D	\$6.40

SPECIAL CONDITIONS:

1. Rates for participation level are added to customer’s base rate in Schedule 1.
2. Customers may elect to discontinue the voluntary program at any time and not receive any charges.
3. The total amount collected each month will be passed on directly to the Deschutes River Conservancy with the express purpose of purchasing water rights to dedicate in-stream to the Deschutes River.
4. The amount received will be transferred to the Deschutes River Conservancy on the 15th of each month.
5. The registration form will be included with billing statements once every two years and will be available at the office.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 12

WOODRIVER VILLAGE TARIFF – SYSTEM IMPACT FEE

PURPOSE: To reimburse those developers who contributed to certain line improvements that also benefit future developers in Woodriver Village.

AVAILABLE: To customers of the Utility at Deschutes and Crook Counties, Oregon, and vicinity.

APPLICABLE: To developers of projects in Woodriver Village, Bend, Oregon using the Company’s water service.

The mainline contemplated by the previous version of this tariff was fully funded by developers and was put in service in December 2018. In order to provide equitable reimbursement as per the original agreement, the following line share agreement is in effect:

Refunds – Ten Year Line Share Agreement:

The system impact fee will be charged at the standard SDC rate as provided by Schedule 7. From the collected funds, \$458.64 will be evenly distributed among the original participants as required in the original PUC approved version of this tariff. The remaining funds will be CIAC.

Refunds will only occur for the ten year period following completion or until 120 units are developed from the original date of implementation of this Schedule 12. The ten year period will be complete January 1, 2029 and this tariff will no longer be in effect.

SPECIAL CONDITIONS:

1. All Woodriver Village funds will be maintained in a separate account.
2. Avion will provide annual construction / construction funds update to Commission Staff by February 1 of each year for the ten-year line share agreement duration.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 13

NOTTINGHAM IRRIGATION CUSTOMERS

AVAILABLE: To all bulk irrigation customers in Nottingham subdivision, Bend, Oregon

APPLICABLE: To those irrigation customers who do not have water rights adjudicated to their land yet, still receive bulk irrigation service.

BILLING PERIOD: Monthly rates for irrigation service are charged throughout the year.

FLAT RATE

Bulk Water	Monthly Base Rate	Usage Allowance
Nottingham Square Residential	\$42.53	N/A
Nottingham Square HOA (17 Residential Equivalents)	\$722.93	N/A

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 14

INTERRUPTABLE LARGE IRRIGATION CUSTOMERS

AVAILABLE: To all irrigation customers using domestic water with 4- or 6-inch meters, Bend, Oregon

APPLICABLE: To those irrigation customers who irrigate with 4- or 6-inch meters and agree to be the first accounts interrupted in the event of Avion exceeding their water rights maximum.

BILLING PERIOD: Monthly rates for irrigation service are charged throughout the year.

BASE RATE

Service Meter Size	Monthly Base Rate	Usage Allowance
4 inches	As per Schedule No. 1	None
6 inches	As per Schedule No. 1	None

COMMODITY USAGE RATE

Commodity Rate	Per	No. of Units	Unit of Measure	Base Usage Allowance	Unit of Measure
\$.65	Per	100	Cubic Feet	None	Cubic Feet

SPECIAL PROVISIONS:

1. Avion will provide 30 days notice prior to each curtailment event, unless circumstances don't allow notice.
2. Non-compliance will result in removal of meter at customers expense.
3. Damages – Avion is not liable for damages etc. due to interruption of service pursuant to this schedule.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 15

West Pilot Butte Airport Tariff – System Impact Fee

Purpose: To provide funding to upgrade the main service lines in the applicable area to accommodate development without causing undue financial burden upon any one developer.

Available: To customers of the Utility at Deschutes and Crook Counties, Oregon, and vicinity. Not available to customers served by 1-1/2” or smaller mainlines.

Applicable: To developers of Accessory Dwelling Unit (ADU), duplex, and two-parcel partition projects in Bend, Oregon using the Company’s water service, in the Utility’s service territory, located north and west of the Pilot Butte Airport and south of Bear Creek Road, in Township 18 South, Range 12 East, Section 3.

Cost Estimate of installing main service line:

Phase 1 (12” line across airstrip) = \$90,000
 Phase 2 (8” line up Craven and Myrtlewood) = \$88,000
 Phase 3 (8” line continuing up Craven) = \$76,000
 Phase 4 (8” line up Waco) = \$34,000
 Total = \$288,000

Estimated number of new connections in the applicable area is 30 (20% of 150).

West Pilot Butte Airport System Impact Fee - Schedule A:

RESIDENTIAL UNIT EQUIVALENTS BY SERVICE METER SIZE

SERVICE	FEE
Standard Meter Connection – 5/8”x3/4”	\$9,600

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

As a result, the 5/8"x3/4" inch system impact fee will equal = \$9,600 per service (\$288,000 / 30 connections). This amount is subject to refunds pursuant to Oregon Administrative Rule 860-036-1310 and Avion Rules 10 and 11 as contained in Avion's tariffs. The system impact fees collected for this area will be deposited into a separate account. The impact fees are also subject to Schedule 8 of the Avion Tariff, and fees collected under Schedule 8 will be subject to the associated conditions and refundable as described in Schedule 8.

When the target amount of \$90,000 for Phase 1 is reached, the project will be re-estimated and providing the cost is within the budget limits of collections, the Phase 1 line will be installed. When the target amount of \$88,000 is collected for Phase 2, the project will be re-estimated and providing the cost is within the budget limits of collections, the Phase 2 line will be installed. This process will be repeated for Phases 3 and 4. If the pattern of development dictates a change in the implementation order for phases 2-4, such change shall be made to maximize the improvement in service provided by the available funds. If the cost of installation is above the collected amount, additional system impact fees will be collected at the rates listed in the above West Pilot Butte Airport System Impact Fee - Schedule A until the new target is reached. This procedure will be repeated until the project is able to be completed.

SDC charges under Schedule 7 of the Avion tariff will be waived for developers contributing under this Schedule 15 tariff, including those contributing under the follow-on line share agreement below.

In the event that development: 1) for an area outside the applicable area; or 2) for a project that is not eligible for this tariff; requires completion of one of the phases as an offsite improvement:

1. That phase will be removed from consideration under this tariff.
2. The next phase will commence as previously outlined.
3. The amount collected from each developer will not change; the refund period will simply start sooner.

Refunds - Ten year Line share Agreement:

For a period of ten years following the completion of the final phase as outlined above a line share agreement shall be in effect for subsequent developers. Developers will be charged a fee, and the proceeds will be refunded to those who already paid the fee. The amount paid during the line share period will be calculated according to the following formula:

$$Fee_n = \frac{Total\ Project\ Cost}{n}$$

$$Refund = \frac{Fee_n}{n - 1}$$

Where n is the new total number of contributors to the project.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

The intention is that at the termination of the line share period, all developers will have contributed an equal amount. Refunds will be distributed annually. Developers shall maintain a current mailing address with Avion Water Company. Refunds due to those developers without an updated mailing address will be turned over the state unclaimed property division.

Special Conditions:

1. All West Pilot Butte Airport funds will be maintained in a separate account.
2. Avion will provide annual construction / construction funds update to Commission Staff by February 1 of each year for the ten-year line share agreement duration.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 16

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

SCHEDULE NO. 17

PRESSURIZED IRRIGATION SUPPLEMENTATION TEST TARIFF

Schedule No. 17 exists to support a short-term test program in which Avion works cooperatively with irrigation districts to provide water to surface irrigation customers who would be curtailed due to drought.

PURPOSE: To provide a means of outdoor watering for surface irrigation customers that manages demand to avoid negatively impacting the Greater Avion system.

APPLICABLE: To customers on Schedule 2 in selected pressurized surface water irrigation systems at high risk for loss of water due to drought where Avion has adequate off-peak domestic capacity and infrastructure proximity to conduct the test.

Several subdivisions within the Greater Avion system have dual pipe systems. These systems use one set of pipes to deliver domestic drinking water and another set of pipes to deliver pressurized surface irrigation water for outdoor watering purposes. The diameter of the domestic mainlines in these dual pipe systems was based upon the assumption that surface water deliveries would be available, and these systems are therefore unable to provide adequate pressure if the domestic system were forced to make up for a lack of surface water. Due to a number of factors including extreme drought, surface water deliveries have been substantially reduced over the past several years. This trend is expected to continue for the foreseeable future. In order to maintain the current level of domestic service, Avion is conducting test events in which selected surface water systems are charged with domestic water during low demand times of day. If these tests are successful and the reduction in surface water continues, a new permanent tariff will be filed for the systems being converted to replace surface water with domestic water.

RATES: Customers will be billed at the same rate they pay under Schedule 2 of this tariff.

DELIVERY: Delivery will be made at the flow rate to which the customer is entitled based upon their water right. Water is expected to be delivered approximately between the hours of 8:00 pm and 5:00 am. Time(s) of delivery will be adjusted as needed to minimize impacts to other customers.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RESERVED FOR FUTURE USE

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

RULES AND REGULATIONS

Rule 1: Jurisdiction of the Commission

Water systems are subject to regulation as provided under ORS [Chapter 757](#)

Rule 2: Definitions

- A. "Applicant" means a person who does not meet the definition of a customer, who applies for service with a water utility.
- B. "Commission" shall mean the Public Utility Commission of Oregon.
- C. "Commercial service" means water service provided by the water utility that the customer uses in the promotion of a business or business product that is a source of revenue or income to the customer or others using the premises.
- D. "Customer" means a person who is currently receiving water service and is entitled to certain rights as a customer under these rules. A residential customer retains customer status for 20 calendar days following voluntary disconnection of service and must be treated as a customer if he or she reapplies for service within that 20 calendar day period.
- E. "Customer's service line" is defined as the facilities used to convey water from the point of connection to the customer's point of usage. The customer owns and maintains the customer service line.
- F. "Residential service" means water service provided for domestic or irrigation purposes in a residential area and is not considered a commercial service.
- G. "Served" for purpose of delivery of any required notice or document, unless otherwise specifically noted, means: delivered in person, by personal contact over the telephone, or in writing delivered to the party's last known address. If delivered by US Mail, the notice is considered served two calendar days after the date postmarked, the date of postage metering, or deposit in the US Mail, excluding Sundays and postal holidays.
- H. "Utility" shall mean: AVION WATER COMPANY, INC.
- I. "Water service connection" is defined as the facilities used to connect a water utility's distribution network to the point of connection at the customer's service line. The water utility owns and maintains the water service connection.

APPLICATION FOR SERVICE

Rule 3: Information for Applicants and Customers ([OAR 860-036-1100](#))

The Utility shall provide or be able to provide customers or applicants with the following information:

- A. A copy of its approved tariffs or statement of rates;
- B. A copy of the utility's rules and regulations applicable to the type of service being provided; and

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

- C. The option to receive electronic copies of all written notices to be issued on the customer's account.

Rule 4: Application for Service (OAR 860-036-1200)

Application for water service must be made for each individual property to be served. The application shall identify the name of the applicant, the service address, the billing address, the contact information where the applicant can be reached, the type of water service requested and its intended use, and the name to be used to identify the account, if different than the applicant's actual name. The applicant shall, at this time, pay any scheduled fees or deposits. An application is a request for service and shall not be accepted until the applicant establishes credit as set forth in [OAR 860-036-1210](#).

An application for service must be made where:

- A. An applicant, who has not previously been served by the Utility, requests service; or
- B. Service has been involuntarily discontinued in accordance with the Utility and Commission rules, and service is requested; or
- C. Service has been voluntarily discontinued and a request to restore service has not been made within 20 days; or
- D. There is a change in the type of use to which the water is put, or the number of premises served.

Rule 5: Establishment of Credit, Surety Agreements, Deposits, Interest, and Refunds of

Deposits (OAR 860-036-1210, 1220, 1230, 1240, 1250, and 1260)

The utility may require an applicant or customer to pay a deposit as a guarantee of payment for services provided. Amounts held by a water utility may not exceed one-sixth of the actual or estimated annual billing for the premises. ([OAR 860-036-1220](#))

The water utility may adjust the deposit amount when a customer moves to a new location within the water utility's service area, and the anticipated bill at the new residence will be at least 20 percent greater than the basis of the existing deposit. ([OAR 860-036-1220\(5\)](#))

The Utility must inform any residential applicant or customer who is required to pay a deposit of the opportunity to provide a written surety agreement in lieu of paying the deposit. A surety agreement obligates another qualifying residential customer of the same utility to pay an amount up to the required deposit if the secured account is later disconnected and a balance remains owing following the due date for the closing charges. To qualify as a surety, the other residential customer must have had 12 months of continuous service with the Utility without a late payment. ([OAR 860-036-1230](#))

The Utility shall pay interest on deposits at the rate established by the Commission. After the customer has paid its water service bills for 12 consecutive months without having had service discontinued for

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

nonpayment, or did not have more than two occasions in which a shut-off notice was issued, and the customer is not then delinquent in the payment of bills, the Utility shall promptly and automatically refund the deposit plus accrued interest by **(check one)** ([OAR 860-036-1250](#) and [1260](#)):

- 1. Issuing the customer a refund check, or
- 2. Crediting the customer's account; however, a customer is entitled to a refund upon request pursuant to [OAR 860-036-1260](#).

Rule 6: Customer Service Line ([OAR 860-036-1300\(2\)](#))

The customer shall own and maintain the customer service line and promptly repair all breaks and leaks. For non-metered service, the customer service line begins at the property line or utility-owned shut-off valve. For metered service, the customer service line begins on the customer's side of the meter or utility-owned shut-off valve. The Utility shall not be responsible for any damage or poor service due to inadequacy of the customer service line or any portion of the customer's plumbing. All leaks in the customer service line, faucets, and all other parts of the plumbing owned or controlled by the customer shall be promptly repaired so as not to waste water.

Rule 7: Separate Control of Service

All premises supplied with water will be served through service lines so placed as to enable the Utility to control the supply to each individual premise using a valve placed within and near the line of the street, the Utility right-of-way, or at the meter.

Rule 8: Water Service Connections ([OAR 860-036-1300](#))

The water service connection is defined as the facilities used to connect the Utility's distribution network to the point of connection at the customer's service line. The Utility owns, operates, maintains, and replaces the service connection when necessary and promptly repairs all breaks and leaks. The customer shall not be responsible for any damage or poor service due to inadequacy of the Utility's service lines or any portion of the Utility's plumbing.

Rule 9: Service Connection Charge ([OAR 860-036-1300\(3\)](#))

An applicant requesting permanent water service to a premise not previously supplied with permanent service by the Utility may be required to pay the cost of the service connection, including or excluding the meter as provided in Rule No. 8 and the Utility's Miscellaneous Service Charges in this tariff.

Rule 10: Main Line Extension Policy ([OAR 860-036-1310](#))

A main line extension is defined as the extension of the Utility's main line necessary to provide service to a customer when the property does not currently have main line frontage.

Main line extension charges, if any, are stated in the Utility's tariff or statement of rates.

The Utility maintains a main line extension policy that lists all applicable charges; and describes the

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

advance and refund provisions, including a description of the mechanisms for collecting and rebating the amount charged equitably among the customers who paid for the cost of the line, and provides the time period during which the advance and rebate provisions apply.

Rule 11: Types of Use

Water service may be supplied for residential, commercial, irrigation, temporary construction, special contracts, fire prevention, and other uses. The Utility shall file separate rate schedules for each type of use and basis of supply.

Rule 12: Multiple Residences/Commercial Users

An apartment building, mobile home park, motel, trailer camp, duplex, townhouse, or any property consisting of more than one residential/commercial unit, if served through one service line, shall be considered to be equivalent to the number of dwelling units when determining the customer count.

Rule 13: Utility Access to Private Property ([OAR 860-036-1370, -1500](#))

Customers shall provide regular access to Utility-owned service lines that may extend onto the customer's premises for the purposes of reading meters, maintenance, inspections, or removal of Utility property at the time service is to be discontinued. Where the customer does not cooperate in providing reasonable access to the meter or to the premises, as required by law or to determine if a health or safety hazard exists, it is grounds for disconnection.

Rule 14: Restriction on Entering a Customer Residence ([OAR 860-036-1330](#))

No Utility employee shall enter the residence of its customers without proper authorization except in an emergency when life or property is endangered.

REFUSAL OF SERVICE

Rule 15: Refusal of Service Due to Customer Accounts ([OAR 860-036-1270](#))

The Utility may refuse to provide service if:

- A. The applicant has amounts owing under a tariff or statement of rates; or
- B. The applicant for residential service has a roommate with amounts owing under a tariff or statement of rates, and the applicant lived with the roommate at the time the amounts owing were incurred.

Exception: If the applicant for residential service was a former residential customer with amounts owing, was involuntarily disconnected for non-payment, and applies for service within 20 calendar days of the disconnection, the Utility must provide service upon receipt of one-half of the amount owed with the remainder due within 30 calendar days. If the former customer fails to pay the remaining amounts within 30 calendar days, the Utility may disconnect service after issuing a 7-calendar day disconnection notice in accordance with [OAR 860-036-1510\(4\)](#).

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

If service is disconnected, the Utility may refuse to restore service until it receives full payment of all amounts owing, including reconnection charges allowed under [OAR 860-036-1580](#).

Service shall not be refused for matters not related to water service.

Residential service shall not be refused due to obligations connected with nonresidential service. If service is refused under this rule, the Utility shall inform the applicant or customer of the reasons for the refusal and of the Commission’s dispute resolution process.

Rule 16: Refusal of Service Due to Utility Facilities ([OAR 860-036-1270](#))

The Utility shall not accept an application for service or materially change service to a customer if the Utility does not have adequate facilities, resources or capacity to render the service applied for, or if the desired service is of a character that is likely to unfavorably affect reasonable service to other customers.

For refusal of service under this rule, the Utility shall provide a written letter of refusal to the applicant within seven calendar days, informing applicant that the details upon which the Utility’s decision was based may be requested.

The details will include, but not be limited to:

- A. Provide the information required by [OAR 860-036-1100\(2\)](#);
- B. Explain the specific reasons for refusing water service;
- C. Inform the applicant of the right to request details upon which the Utility's decision was based; and
- D. Inform the applicant of the right to dispute the refusal by contacting the Consumer Services Section at the contact information provided in [OAR 860-001-0020\(2\)](#).

Rule 17: Refusal of Service Due to Customer Facilities ([OAR 860-036-1270](#))

The Utility will refuse service to an applicant whose facilities do not comply with applicable plumbing codes or, if in the best judgment of the Utility, are of such a character that safe and satisfactory service cannot be given.

If service is refused under this rule, the Utility will provide written notification to the applicant within seven calendar days stating the reason(s) for refusal and providing information regarding the Commission’s complaint process.

METERS

Rule 18: Utility Meters ([OAR 860-036-1350](#))

The Utility owns, maintains, and operates all meters. Meters placed in service will be adequate in size and design for the type of service, set at convenient locations, accessible to the Utility, subject to the Utility’s control, and placed in a meter box or vault between the street curb and property line or within the landscape buffer. Each meter box or vault will be provided with a suitable cover.

Where additional meters are installed by the Utility or relocated for the convenience of the customer, the

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

actual cost incurred for any meter relocation requested by the customer will be assessed.

The Utility shall have the right to set meters or other devices for the detection and prevention of fraud or waste without notice to the customer.

Customers whose meters are blocked by barriers including vehicles, fences, rocks, bushes, trees, or other objects will be notified by mail. Failure to remove the barrier after the Utility provides reasonable written notice to the customer is grounds for disconnection of service (OAR 860-036-1500). In general, 24" is considered sufficient clearance from obstacles to allow meter access.

Rule 19: Meter Testing ([OAR 860-036-1350](#))

The meter will be tested prior to or within 30 days of installation to determine it is accurate to register not more than two percent error. No meter will be allowed to remain in service if it registers an error in excess of two percent (fast or slow) under normal operating conditions. The Utility will maintain a record of all meter tests and results. Meter test result records will include:

- A. Meter identification number and location;
- B. Reason for making the test;
- C. Method of testing;
- D. The beginning and ending meter readings;
- E. Test results and conclusion; and
- F. All data taken at the time of the test.

Rule 20: Customer-Requested Meter Test ([OAR 860-036-1360](#))

A customer may request that the Utility test the service meter once every 12 months at no cost. Such test shall be made within seven calendar days of the receipt of the request unless the customer fails to provide the Utility reasonable access to the meter. The customer or the customer's representative has the right to be present during the test, which is to be scheduled at a mutually agreeable time. Within seven calendar days of performing the requested meter test, report shall be provided to the customer stating:

- A. The name of the customer requesting the test and the service address where the meter was tested;
- B. The date the meter test was requested and the date the meter test was performed;
- C. The name of the person performing the test;
- D. The meter identification number and location;
- E. The beginning and ending meter readings; and
- F. The actual test results and conclusion.

If a customer requests a meter test more often than once in any 12-month period, and the test results indicate that the meter is registering within the two percent performance standard, the customer may be assessed a reasonable charge for the test if the charge is included in the Miscellaneous Service Charges Schedule. If the meter registers outside the two percent performance standard, the Utility may not charge the customer for the meter test.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

BILLING

Rule 21: Billing Information and Late-Payment Charge (OAR 860-036 1100(2), 1400, and 1430)

All bills, including closing bills, are due and payable at the Utility office within at least 15 days when rendered by deposit in the mail or other reasonable means of delivery, unless otherwise specified on the bill. The date of presentation is the date on which the Utility mails the bill.

As near as practical, meters shall be read **(check one)** monthly, bimonthly, or quarterly on the corresponding day of each meter reading or billing period. The bill will be rendered immediately thereafter. The Utility will provide its customers with timely billings every month or as indicated in its tariffs or statement of rates.

When there is good reason for doing so, bills may be rendered based upon estimated meter reads. Estimates are expected to be used during winter months of December and January. Any estimated reads shall be clearly designated as such. Estimated reads shall be as follows:

Winter (November through March) residential usage will be estimated at 700 cubic feet per month.

Winter (November through March) commercial usage will be estimated from the previous actual meter reading or 700 cubic feet, whichever method provides the most consistent billing for the commercial customer. The Customer may request either method.

Summer (April through October) will be estimated based on the average of the previous three months usage or the same month's usage for the prior year (if available). The Utility may decrease estimated billings based upon changes in plant pumping rates so that customers will, insofar as practical, not be overbilled.

All water service bills will show:

- A. Separate line items for past due balance, payments and credits, new charges, late fees, and total account balance;
- B. The date new charges are due;
- C. Calculation of new charges including base or flat rate, usage billing tiers and rates, beginning and ending meter readings, the dates the meter was read, rate schedule, billing period, and number of days in the billing period;
- D. The date any late payment charge was applied and an explanation of the terms of the late payment charge; and
- E. Any other information necessary for the computation of the bill.

A late-payment charge may be assessed against any account that has an unpaid balance when the next bill is being prepared. The charge will be computed on the delinquent balance owing at the time of preparing the subsequent month's bill at the late-payment rate specified in the Miscellaneous Service Charges Schedule. The late-payment rate is determined annually by the Commission, and the Utility will be notified of the rate.

If an account is permitted to become delinquent, the Utility may disconnect water service by giving proper notice to the customer as provided in Rules 28 & 29, prior to or after the Utility assesses the late payment charge.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

Rule 22: Returned Payment Charge

The Returned Payment Charge listed on the Miscellaneous Service Charges Schedule shall be billed for each occasion a customer submits any type of noncash payment (check, debit, electronic, etc.) that is not honored, for any reason, by a bank or other financial institution.

Rule 23: Prorating of Bills

Initial and final bills will be prorated according to the number of days service was rendered and on the basis of a 31-day month. For metered services, a reasonable effort will be made to read the meter upon opening and closing a customer's account. Consumption will be charged at scheduled rates. Any minimum monthly charge will be prorated.

Rule 24: Adjustment of Bills (OAR 860-036-1440)

When an overbilling occurs, the Utility will refund or credit amounts incorrectly collected. No refund or credit will be issued for incorrect billings which occurred more than three years before the incorrect billing was discovered.

When an underbilling occurs, the Utility will issue a bill to collect amounts owing for the 12-month period ending on the date on which the water utility issued the last incorrect bill. When such under collected amounts are billed to customers, the Utility will provide written notice to the customer detailing:

- A. The circumstances and time period of the billing error;
- B. The corrected bill amount and the amount of the necessary adjustment;
- C. The Commission's consumer complaint process; and
- D. The right for a current or former customer to enter into a time-payment agreement with the Utility.

The Utility will not bill for services provided more than two years before the underbilling was discovered. No billing adjustment will be required if a meter registers less than two percent error under conditions of normal operation. The Utility may waive rebilling or issuing a refund check when the costs make such action uneconomical.

Rule 25: Transfer Billings (OAR 860-036-1450)

If the Utility determines that a customer owes an amount from a closed account the customer previously held with the Utility, the Utility may transfer the closed account balance to the customer's current account.

The Utility will give the customer prior notice of the transfer, including:

- A. The amount due under the prior account; and
- B. The period when the balance was incurred; and
- C. The service address under which the bill was incurred.

If the customer has an amount remaining on an existing time-payment agreement, the customer may enter into a new time-payment agreement to include the transfer. The Utility will not transfer a balance owing on a non-residential account to a residential account.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

Rule 26: Damages/Tampering

Should damage result to any of the Utility’s property from molesting or willful neglect by the customer, the Utility will repair or replace such equipment and will bill the customer as per Schedule 3. (OAR 860-036-1590).

DISCONNECTION OF WATER SERVICE

Rule 27: Voluntary Discontinuance (OAR 860-036-1560)

A customer requesting disconnection of service must provide the Utility with at least seven calendar days’ advance notice. The customer is responsible for all service provided for seven calendar days following the request for disconnection or until service is disconnected, whichever comes first; or if the customer identified a specific date for disconnection in excess of seven calendar days, the customer is responsible for service rendered up to and including the requested date of disconnection.

Rates are based on continuous service. Disconnect and reconnect transactions do not relieve a customer from the obligation to pay the base rate or minimum charge that accumulates during the period of time the service is voluntarily disconnected for up to 12 months. Should the customer wish to recommence service within 12 months at the same premise, the customer will be required to pay the accumulated minimum monthly charge or base rate as if service had been continuous. The reconnection charge listed on the Miscellaneous Service Charges Schedule will be applicable at the time of reconnection.

Nothing in this rule prevents the Utility from temporarily interrupting service to protect the health and safety of its customers or to maintain the integrity of its system.

Rule 28: Emergency Disconnection (OAR 860-036-1630)

The Utility may terminate service in emergencies when life or property is endangered without following the procedures set forth in [OAR 860-036-1630](#). Immediately thereafter, the Utility will notify the customer and the Commission. When the emergency termination was through no fault of the customer, the Utility shall not charge the customer for disconnection or restoration of service.

Rule 29: Disconnection of Water Service Charge for Cause (OAR 860-036-1500, -1510, -1520, -1530, and 1550)

The Utility may disconnect service when:

- A. A customer fails to pay charges due for services rendered under a water utility tariff or statement of rates;
- B. A customer fails to pay a deposit, fails to timely provide a surety under [OAR 860 036-1230](#) or comply with its terms, or fails to comply with the terms of a deposit installment agreement under [OAR 860-036-1240](#);

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

- C. A customer fails to comply by the terms of a payment agreement under [OAR 860 036-1240\(3\)](#) or [860-036-1420](#);
- D. A customer provides false identification to establish or to continue service;
- E. A customer has facilities that do not comply with the applicable codes, rules, regulations, or the best practices governing safe and adequate water service, including compliance with the water utility's Cross Connection Control Program;
- F. A customer fails to provide reasonable access to the meter or premises;
- G. A customer tampers with water utility facilities or engages in theft of service or unauthorized use of water;
- H. A customer fails to comply with water restriction requirements under [OAR 860-036-1670](#); or
- I. The Commission approves the disconnection of service.

If the disconnection is due to failure to pay a deposit, secure a surety agreement, abide by a deposit installment agreement, abide by the terms of a payment arrangement, or due to the theft of service, tampering with utility property, diverting water, or unauthorized use of water, the Utility will provide one 7-day written disconnection notice prior to disconnection. For other disconnections, the Utility will provide two written notices in advance of disconnection: one 15-day notice and one 7-day notice.

If the disconnection is due to a customer's failure to comply with a water use restriction imposed under [OAR 860-036-1670](#), the utility may disconnect the customer without issuing either a 15-calendar day or 7 calendar day disconnection notice.

The notices shall include:

- A. The name, mailing address, telephone number, emergency telephone number, and email address or website of the Utility,
- B. State that the customer's water service is subject to disconnection on or after a specific date;
- C. Provide the grounds for the proposed disconnection;
- D. State what actions the customer must take in order to avoid disconnection; and
- E. A statement that the customer may dispute the disconnection by contacting the Commission's Consumer Services Section.

If the disconnection notice is for nonpayment, the notice shall also include:

- A. The amount the customer must pay to avoid disconnection;
- B. Provide information about the customer's eligibility for a time-payment agreement provided in [OAR 860-036-1420](#) for residential customers, unless the customer is being disconnected for failing to comply with an existing time-payment agreement or has engaged in theft of service, tampering with utility property, diverting water, or unauthorized use of water; and
- C. A statement that once service is disconnected, the water utility will reconnect service only after the customer reapplies for service and pays all applicable charges.

The 7-calendar day and 15-calendar day advance written notices of disconnection will be hand-delivered in person to the customer or adult at the premises, or sent by the US Mail to the customer's billing address and designated representative. Mailed notices are considered served two calendar days after deposited in the US Mail, excluding Sundays and postal holidays. If the customer has requested to receive notices electronically, the Utility will provide an electronic notice in addition to the written notices.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

Within 48 hours of disconnection, the Utility will make a good-faith effort to contact the customer or an adult at the residence and provide notice of the proposed disconnection. If contact is not made, the Utility shall leave a notice in a conspicuous place at the customer’s premise informing the customer that service has been disconnected.

Disconnection of Water Service to Tenants:

- A. If a water utility's records show that a residential billing address is different from the service address, the water utility must mail a duplicate notice to the service address, unless the utility has verified that the service address is occupied by the customer.
- B. If a water utility's records show that the service location is a master-metered, multi-dwelling service address, the water utility must provide a duplicate of the 7-calendar day disconnection notice to each unit at the service address. The disconnection notice must be addressed to "Tenant." The envelope must bear a bold notice stating, "IMPORTANT NOTICE REGARDING DISCONNECTION OF WATER UTILITY SERVICE." Tenant notices may not include the dollar amount owing.
- C. The water utility must notify the Consumer Services Section at least seven calendar days before disconnecting service to a master-metered, multi-dwelling premise.

Time Payment Agreements ([OAR 860-036-1420](#))

Customers who are notified of pending disconnection, due to reasons other than theft of service, tampering, unauthorized use of water, or failure to abide by the terms of a Time Payment Plan, may choose between two Time Payment Agreement options. The Utility will offer such customers a choice of a levelized-payment plan and an equal-pay arrearage plan. The Utility and customer may mutually agree to an alternate payment arrangement.

Disconnection for Failure to Comply With a Time Payment Agreement ([OAR 860-036-1510\(4\)\(b\)](#))

A time-payment agreement disconnection occurs when a customer fails to comply with the terms of a written time-payment agreement between the customer and the Utility, or the Utility permits a time-payment agreement charge to become delinquent. The Utility will give the customer a 7- day written notice before the water service may be disconnected.

Rule 30: Disconnection, Reconnection and Field Visit Charge ([OAR 860-036-1580](#))

Disconnection and Reconnection Charges

When service was disconnected pursuant to ([OAR 860-036-1500](#)), the Utility may charge the disconnect fee and reconnect fee stated in its tariff prior to reconnecting service.

Field Visit Charge

The Utility may assess a field visit charge whenever the Utility visits a residential service address intending to reconnect or disconnect service, but due to customer action, the Utility is unable to complete the reconnection or disconnection at the time of the visit. The field visit charge is listed in Schedule 3.

Rule 31: Unauthorized Restoration of Service ([OAR 860-036-1590](#))

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

After the water has been disconnected or shut off at the curb stop or at the meter, if any person not authorized by the Utility should turn it on, the water service line may be disconnected as provided by [OAR 860-036-1510](#).

Rule 32: Unauthorized Use ([OAR 860-036-1590](#))

No person shall be allowed to make connection to the Utility mains, or to make any alteration to service connections, or to turn a curb stop off or on to any premises without written permission of the Utility. If the Utility discovers that a customer tampered with or engaged in unauthorized use of utility property facilities, the Utility shall notify the customer of the violations and may take one or more of the following actions:

- A. Repair or restore the facilities and charge the customer the costs incurred;
- B. Adjust the customer's prior billing for loss of revenue under applicable tariffs or schedule of rates;
- C. Initiate a service disconnection as provided by [OAR 860-036-1510](#);
- D. Require a new application for service that accurately reflects the customer's proposed water use; and
- E. Assess a deposit for restored or continued service.

Rule 33: Interruption of Service ([OAR 860-036-1630](#), [-1640](#))

The Utility may perform an unscheduled interruption of service as necessary to protect the health and safety of its customers or to maintain the integrity of its system. If an unscheduled interruption of service is required, the water utility must:

- A. Make a reasonable effort to notify the customers affected and the Consumer Services Section in advance of the interruption;
- B. Report the unscheduled interruption to the Consumer Services Section at the contact information provided in [OAR 860-001-0020\(2\)](#), and
- C. Restore service as soon as it is reasonably possible after resolving the issue, unless other arrangements are agreed to by the affected customers.

The Utility may schedule water service interruptions for maintenance and repairs in such a manner that reasonably minimizes customer inconvenience. The Utility will provide advance written notice to all customers affected by any scheduled service interruption, and will post the notice in the utility's office and on its website, if available. The notice will include:

- A. The name, mailing address, telephone number, emergency telephone number, and email address or website of the Utility;
- B. The date, time, and estimated duration of the scheduled interruption;
- C. The purpose of the interruption;
- D. A statement cautioning customers to avoid using water during service interruptions to prevent debris in the customers' service lines; and
- E. The contact information for the Consumer Services Section provided in [OAR 860 001-0020\(2\)](#).

Notices of scheduled interruptions of service must be served by a door hanger or personal delivery to an adult at the affected premises at least five calendar days in advance of the service interruption or by US Mail at least ten calendar days prior to the service interruption. In addition, electronic notice must be provided to customers who requested to receive notices electronically.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

Rule 34: Water Usage Restrictions (OAR 860-036-1670)

The Utility shall exercise due diligence to furnish a continuous and adequate supply of water to its customers. During times of water shortage, the Utility will equitably apportion its available water supply among its customers with regard to public health and safety. In times of water shortages, the Utility may restrict water usage after providing written notice to its customers and the Consumer Services Section. Notice will also be posted in the Utility's office and on its website, if available. The notification must state the reason and nature of the restrictions, the date restrictions will become effective, the estimated date the restrictions end, and that failure to comply with the restrictions is grounds for disconnection.

If a customer fails to comply with the water restrictions after receiving written notification, the Utility will provide a separate written warning letter to the customer including:

- A. The date;
- B. The name, mailing address, telephone number, emergency telephone number, and email address or website of the Utility;
- C. The customer's name, account number, mailing address, service address if different;
- D. The water use restrictions and statement of how the customer is violating those restrictions;
- E. A statement that the customer's water service is subject to disconnection on or after a specific date;
- F. A warning to the customer that failure to immediately comply with the restrictions may result in disconnection of service; and
- G. A statement that the customer may dispute disconnection by contacting the Consumer Services Section. The notice must include the Consumer Services Section's contact information provided in [OAR 860-001-0020\(2\)](#).

If a customer fails to comply with the water restrictions after receiving written notification and the warning letter, the Utility will consult with the Consumer Services Section to determine if disconnection is appropriate.

SERVICE QUALITY

Rule 35: Adequacy of Water Service (OAR 860-036-1600)

The Utility will maintain its facilities according to industry rules, regulations, and standards and in such condition to provide safe, adequate, and continuous service to its customers.

The Utility will not intentionally diminish the quality of service below the level that can reasonably be provided by its facilities.

Rule 36: Trouble Call

The trouble-call charge listed on the Miscellaneous Service Charges Schedule may be billed whenever a customer requests that the Utility visit the customer's premises to remedy a service problem and the problem is due to the customer's facilities.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

Rule 37: Water Purity (OAR 860-036-1610)

The Utility will provide a domestic water supply that is free from bodily injurious physical elements and disease-producing bacteria and reasonably free from elements that cause physical damage to customer property, including but not limited to pipes, valves, appliances, and personal property.

Rule 38: Water Pressure (OAR 860-036-1650)

The Utility will maintain adequate water pressure. In general, water pressure measuring between 45 and 80 pounds per square inch in the water mains is considered adequate. However, adequate pressure may vary depending on each individual water system.

The Utility may temporarily reduce or increase water pressure for fire flows, noticed repairs and maintenance, scheduled or emergency flushing, and unscheduled or emergency repairs and outages.

Rule 39: Pressure Surveys (OAR 860-036-1650)

The Utility will maintain permanent pressure recording gauges at various locations to measure the system's water pressure, and will have a portable gauge to measure water pressure in any part of the system. The Utility will maintain all pressure gauges in good operating condition, test periodically for accuracy, and recalibrate or replace when necessary.

Rule 40: Customer-Requested Pressure Test (OAR 860-036-1660)

Upon customer request, the Utility will perform a water pressure test within seven calendar days of the request. The first pressure test in any 12-month period will be at no charge. If the customer requests an additional pressure test within any 12-month period at the same premises, the Utility will assess the customer a charge in accordance with the service charges set forth in Schedule 3 of the tariff. The pressure will be measured at a point adjacent to the meter on the customer service line or other reasonable point most likely to reflect the actual service pressure.

The Utility will provide a written report to the customer within seven calendar days of the pressure test. The report will include:

- A. The name, mailing address, telephone number, emergency telephone number, and email address or website of the Utility;
- B. The customer's name and service address where the pressure was tested;
- C. The date the pressure test was requested and the date the pressure test was performed;
- D. The name of the company or employee performing the test;
- E. The place where the pressure was measured;
- F. The actual pressure reading; and
- G. The conclusion based on the test result.

Rule 41: Utility Line Location (One Call Program)

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

The Utility and its customers will comply with the requirements of OAR 952-001-0010 through and including OAR 952-001-0090 (One Call Program) regarding identification and notification of underground facilities.

Rule 42: Cross Connection/Backflow Prevention Program ([OAR 860-036-1680](#))

All customers must comply with the Utility's Cross Connection Control Program to protect the water system from contamination. A customer's failure to comply is grounds for disconnection under OAR 860-036-1500.

The Utility will comply with the rules and regulations for the Cross Connection/Backflow Prevention Program, as provided in ORS Chapter 333 and the Utility's approved Backflow Prevention tariff or statement of rates.

Issue Date	December 20, 2022	Effective for Service on or after	January 1, 2023
Issued By	AVION WATER COMPANY, INC.		

From: Sarah Chambers <sarah@avionwater.com>

Sent: Monday, January 13, 2020 3:51 PM PST

To: bsparrow@ci.bend.or.us <bsparrow@ci.bend.or.us>; lcurry@bendoregon.gov <lcurry@bendoregon.gov>; Commercialutb@bendoregon.gov <Commercialutb@bendoregon.gov>; churlbert@bendoregon.gov <churlbert@bendoregon.gov>; Robin May <rmay@bendoregon.gov>

CC: Rick Bailey <rick@avionwater.com>

Subject: Avion Water Co New & Final Customers Sheets for Sewer Coordination - Nov & Dec 2019

Attachment(s): "City of Bend new customers november 2019.xls", "city of bend new customers december 2019.xls", "city of bend final customers december 2019.xls", "city of bend final customers november 2019.xls"

To Whom It May Concern:

Attached are Avion Water Company's New and Final Customers spreadsheets for the sewer coordination for November and December 2019.

Best Regards,

Sarah
Avion Water Company Inc
60813 Parrell Rd
Bend, OR 97702
Office: 541-382-5342
Fax: 541-382-5390
Email: sarah@avionwater.com



\$46.00

00652808200900051250030047

02/05/2009 02:34:24 PM

D-EAS Cnt=1 Stn=4 SRB
\$20.00 \$11.00 \$10.00 \$5.00

Space Reserved and/or as fee/title/instrument/microfilm/reception no.
for _____, Records of this County.
Recorder's Use _____

Witness my hand and seal of County affixed.

Name Title

By: _____, Deputy.

EASEMENT

Between

City of Bend

and

AVION WATER COMPANY, INC.

After recording, return to:

AVION WATER COMPANY, INC.
60813 PARRELL RD
BEND, OR 97702

THIS AGREEMENT made and entered into on November 5, 2008, by and between City of Bend, hereinafter called the first party, and Avion Water Company, Inc., hereinafter called the second party, WITNESSETH:

WHEREAS: The first party is the record owner of the following described real property in Deschutes County, State of Oregon, to-wit:

The East half of the Southeast Quarter of Section 12, Township 17 South, Range 12, East of the Willamette Meridian, Deschutes County, Oregon. Property described in Volume 355, Page 2687 (Deed Records of Deschutes County Clerks Office) Also known as tax lot: 1712120000101

A portion of Sections 5, 6, 7, 8 and 18 Township 17 South, Range 13, East of the Willamette Meridian, Deschutes County, Oregon. Property described in Volume 355, Page 2687 (Deed records of Deschutes County Clerks Office) Also known as tax lot 1713000000104

The Southwest Quarter of the Southeast Quarter of Section 7 and the Northwest Quarter of the Northeast Quarter of Section 18, Township 17 South, Range 13, East of the Willamette Meridian, Deschutes County, Oregon. Property described in Volume 355, Page 2679 (Deed records of Deschutes County Clerks Office) Also known as tax lot: 1713000000105

The West Half of the Northwest Quarter and the Southwest Quarter of Section 17, Township 17 South, Range 13, East of the Willamette Meridian, Deschutes County, Oregon. Property described in Volume 78, Page 739 (Deed records of Deschutes County Clerks Office. Also known as tax lot: 1713170000200

and has the unrestricted right to grant the easement hereinafter described relative to the real estate; and the second party is the record owner of the following described real property in that county and state, to-wit:

N/A

NOW, THEREFORE, in view of the premises and in consideration of \$0 by the second party to the first party paid, the receipt of which is acknowledged by the first party, it is agreed:

The first party hereby grants, assigns and sets over to the second party and easement, to-wit:

Being 30 feet in width over the described property for the purpose of constructing, operating, maintaining, repairing, replacing and re-constructing underground waterlines together with all necessary appurtenances. Said easement is more particularly described in exhibit "A".

(Insert a full description of the nature and type of easement granted by the first party to the second party.)

(OVER)

4
3

The second party shall have all rights of ingress and egress to and from the real estate (including the right from time to time, except as hereinafter provided, to cut, trim and remove trees, brush, overhanging branches and other obstructions) necessary for the second party's use, enjoyment, operation and maintenance of the easement hereby granted and all rights and privileges incident thereto.

Except as to the rights herein granted, the first party shall have the full use and control of the above described real estate.

The second party agrees to save and hold the first party harmless from any and all claims of third parties arising from the second party's use of the rights herein granted.

The period of this easement shall be perpetual, always subject, however, to the following specific conditions, restrictions and considerations:

N/A

If this easement is for a right of way over or across the real estate, the center line of the easement is described as follows:

N/A

and the second party's right of way shall be parallel with the center line and not more than N/A feet distant from either side thereof.

During the existence of this easement, maintenance of the easement and costs of repair of the easement, if damaged by natural disasters or other events for which all holders of an interest in the easement are blameless, shall be the responsibility of (check one): the first party; the second party; both parties, share and share alike; both parties, with the first party responsible for _____% and the second party responsible for _____%. (If the last alternative is selected, the percentages allocated to each party should total 100)

During the existence of this easement, holders of an interest in the easement who are responsible for damage to the easement because of negligence or abnormal use shall repair the damage at their sole expense.

This agreement shall bind and inure to the benefit of, as the circumstances may require, not only the parties hereto but also their respective heirs, executors, administrators, assigns, and successors in interest.

In construing this agreement, where the context so requires, the singular includes the plural and all grammatical changes shall be made so that this agreement shall apply equally to individuals and to corporations. If the undersigned is a corporation, it has caused its name to be signed and its seal, if any, affixed by an officer or other person duly authorized to do so by its board of directors.

IN WITNESS WHEREOF, the parties have hereunto set their hands in duplicate on the day and year first written above.

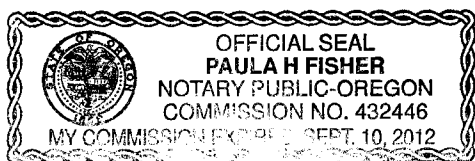
[Handwritten signature]

(First Party)

STATE OF OREGON, County of Deschutes) ss.

This instrument was acknowledged before me on January 29, 2009 by ERIC KING

This instrument was acknowledged before me on _____ as _____ of _____



Paula H. Fisher
Notary Public of Oregon
My commission expires Sept 10, 2012

Jason Wick
Jason Wick, Vice President

(Second Party)

STATE OF OREGON, County of Deschutes) ss.

This instrument was acknowledged before me on Nov. 12, 2008 by Jason Wick

This instrument was acknowledged before me on _____ as _____ of _____



Mike Hefferman
Notary Public of Oregon
My commission expires Nov. 27, 2009

WATER LINE EASEMENT

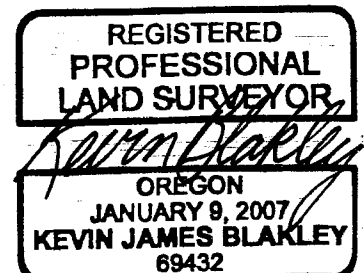
Exhibit "A"

A 30.00 foot wide Water Line Easement, for the benefit of Avion Water Company, located in the Southeast One-Quarter (SE 1/4) of Section Twelve (12), Township Seventeen (17) South, Range Twelve (12) East, and the Southwest One-Quarter (SW 1/4) of Section Seven (7), and the North One-Half (1/2) of Section Eighteen (18), and the West One-Half (W 1/2) of Section Seventeen (17), Township Seventeen (17) South, Range Thirteen (13) East, Willamette Meridian, Deschutes County, Oregon, said easement lying 15.00 feet on each side of the following described centerline:

Beginning at a point on said centerline, from which the Northwest corner of said Section 18 bears South 51°37'43" East 697.91 feet, said point being the TRUE POINT OF BEGINNING for said Water Line Easement; thence along said centerline South 62°03'55" East 621.25 feet to a point on the East line of said Section 12, from which said aforementioned Northwest corner of said Section 18 bears South 00°40'59" West 142.21 feet; thence leaving said East line of Section 12 and along said centerline South 62°03'55" East 311.64 feet to a point on the North line of said Section 18, from which said aforementioned Northwest corner of said Section 18 bears North 89°12'59" West 277.05 feet; thence leaving said North line of Section 18 and along said centerline South 62°03'55" East 2631.62 feet to a point on the North-South center section line of said Section 18, from which the Center-North One-Sixteenth (1/16) corner of said Section 18 bears South 00°10'24" West 113.59 feet; thence leaving said North-South center section line of Section 18 and along said centerline South 62°03'55" East 1605.91 feet; and along an arc of a 1600.00 foot radius curve to the right 423.11 feet, the chord of which bears South 54°29'22" East 421.88 feet; and along an arc of a 1600.00 foot radius curve to the left 755.07 feet, the chord of which bears South 60°26'00" East 748.09 feet; and South 73°57'10" East 248.34 feet to a point on the East line of said Section 18, from which the East One-Quarter (1/4) of said Section 18 bears South 00°30'15" West 15.57 feet; thence leaving said East line of Section 18 and along said centerline South 73°57'10" East 58.65 feet to a point on the East-West center section line of said Section 17, from which said aforementioned East One-Quarter (1/4) corner of said Section 18 bears North 89°20'46" West 56.51 feet; thence leaving said East-West center section line and along said centerline South 73°57'10" East 69.80 feet; and South 159.73 feet to the terminus of said Water Line Easement.

EXCEPTING THEREFROM the public right-of-way of Powell Butte Highway.

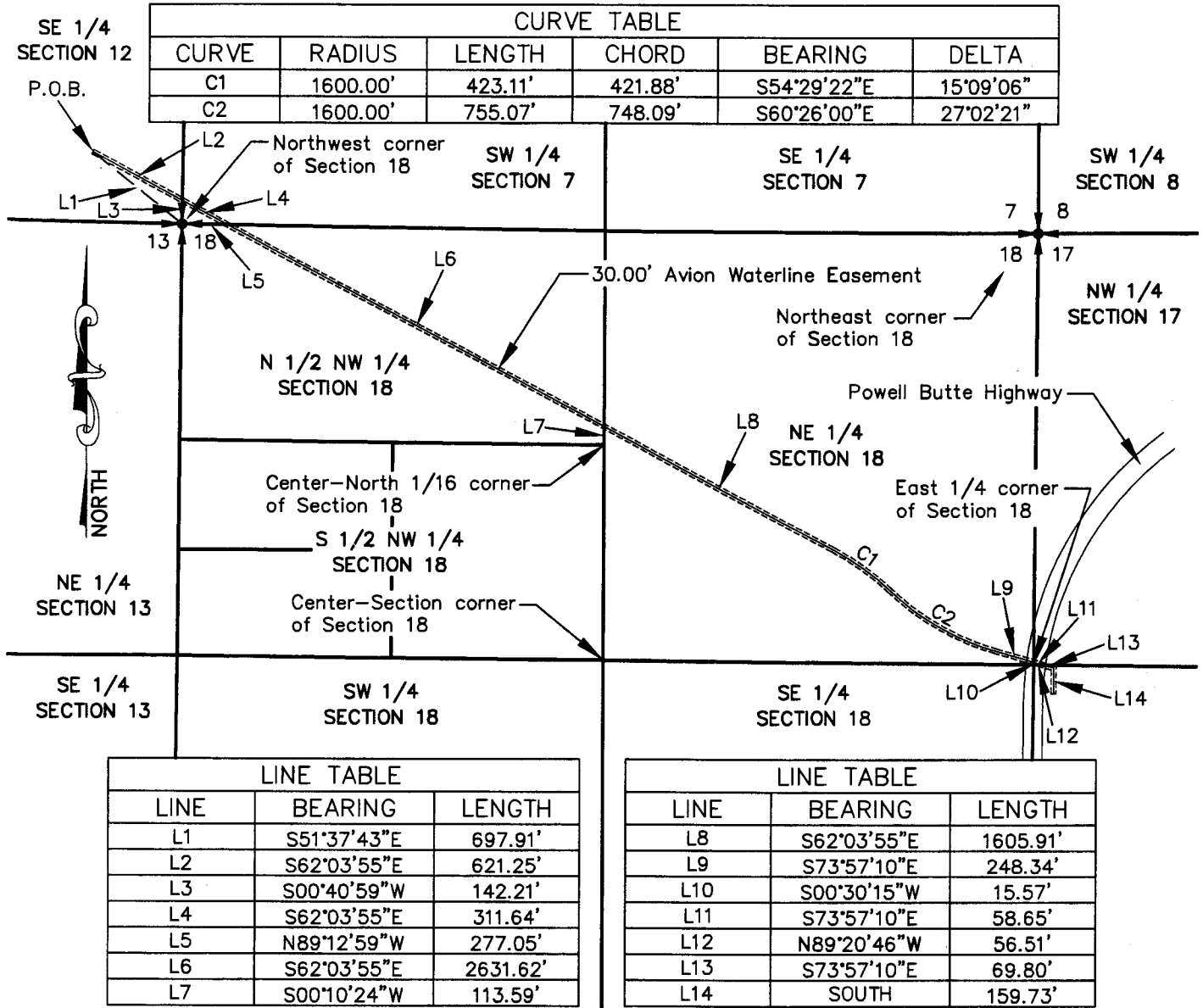
Sun Country Engineering & Surveying, Inc.



RENEWAL 12-31-09
Exhibit 7

WATER LINE EASEMENT EXHIBIT "A"

LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 12, TOWNSHIP 17 SOUTH, RANGE 12 EAST, AND THE SOUTHWEST ONE-QUARTER OF SECTION 7, THE NORTH ONE-HALF OF SECTION 18, THE WEST ONE-HALF OF SECTION 17, TOWNSHIP 17 SOUTH, RANGE 13 EAST, WILLAMETTE MERIDIAN, DESCHUTES COUNTY, OREGON



SCALE: 1" = 1000'
 DATE: 10-09-08
 WO#: 7031-EASE

PREPARED BY:
 SUN COUNTRY ENGINEERING AND SURVEYING, INC.
 920 S.E. ARMOUR ROAD
 BEND, OR 97702

REGISTERED
 PROFESSIONAL
 LAND SURVEYOR

Kevin James Blakley

OREGON
 JANUARY 9, 2007
 KEVIN JAMES BLAKLEY
 69432

RENEWABLE 12-31-2009

EASEMENT

Between

Sunset View Estates
Homeowners Association, Inc.

And

Avion Water Company, Inc

After recording, return to:

AVION WATER COMPANY, INC
60813 PARRELL RD
BEND, OR 97702

Deschutes County Official Records 2021-09201
Nancy Blankenship, County Clerk



01351513202100092010030030

Space R
to
Records

D-EAS Cnt=1 Stn=4 SRB
\$15 00 \$11 00 \$61 00 \$10 00 \$6 00

02/11/2021 02:20 PM

\$103 00

Name Title

By: _____, Deputy.

THIS AGREEMENT made and entered into on February 10th, 2021
by and between Sunset View Estates Homeowners Association, Inc., hereinafter called the first party, and Avion Water
Company, Inc hereinafter called the second party, WITNESSETH:
WHEREAS. The first party is the record owner of the following described real property in Deschutes County, State
of Oregon, to-wit:

Common "C", Sunset View Estates, Phase III-B, Deschutes County Plat Records, Located in the Northeast One-Quarter of
Section 29, Township 18 South, Range 12 East, Willamette Meridian, City of Bend, Deschutes County, Oregon,

Also known as tax lot: 181229A001800

NOW, THEREFORE, in view of the premises and in consideration of \$6500.00 future water credit by the second
party to the first party paid, the receipt of which is acknowledged by the first party, it is agreed:
The first party hereby grants, assigns and sets over to the second party and easement, to-wit:

Being a sanitary well easement (described in O.A R. 333-061-0050(2)(a)(E)) as depicted in Exhibit "A" for existing and future
domestic water wells First party will not use the easement area in a manner that violates State regulations and requirements
for sanitary well easements (O A R. 333-061-0050(2)(a)(E)).

Said easements are more particularly described as follows:

A portion of Taxlot 181229A001800 100 feet x 262 feet abutting the North and East property lines, oriented such that the 100
foot length abuts the west side of China Hat Road and the 262 foot length abuts the southerly property line for Taxlot
181229A000900.

(OVER)

Except as to the rights herein granted, the first party shall have the full use and control of the above described real estate. The second party agrees to save and hold the first party harmless from any and all claims of third parties arising from the second party's use of the rights herein granted.

The period of this easement shall be perpetual

During the existence of this easement, holders of an interest in the easement who are responsible for damage to the easement because of negligence or abnormal use shall repair the damage at their sole expense. Notwithstanding the foregoing, if second party removes or damages any of the first party's fencing in order for second party to use or access the easement area, second party agrees to fully repair or replace the fencing, even if the damage or removal is not caused by negligence or abnormal use.

This agreement shall bind and inure to the benefit of, as the circumstances may require, not only the parties hereto but also their respective heirs, executors, administrators, assigns, and successors in interest.

In construing this agreement, where the context so requires, the singular includes the plural and all grammatical changes shall be made so that this agreement shall apply equally to individuals and to corporations. If the undersigned is a corporation, it has caused its name to be signed and its seal, if any, affixed by an officer or other person duly authorized to do so by its board of directors.

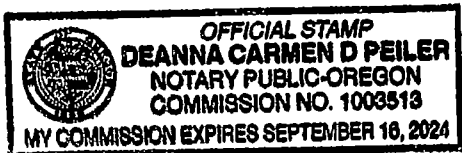
IN WITNESS WHEREOF, the parties have hereunto set their hands in duplicate on the day and year first written above.

Clark Howell

Authorized Signatory for Sunset View Estates Homeowners Association, Inc.

STATE OF OREGON, County of Deschutes) ss.

This instrument was acknowledged before me on February 4th, 2021
by ~~Deanna Colman D. Peiler~~ Clark Howell



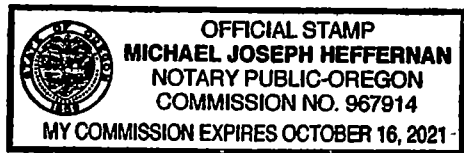
Deanna Peiler
Notary Public of Oregon
My commission expires Sept. 16th, 2024

Adam Jackson

Authorized Signatory for Avion Water Company, Inc

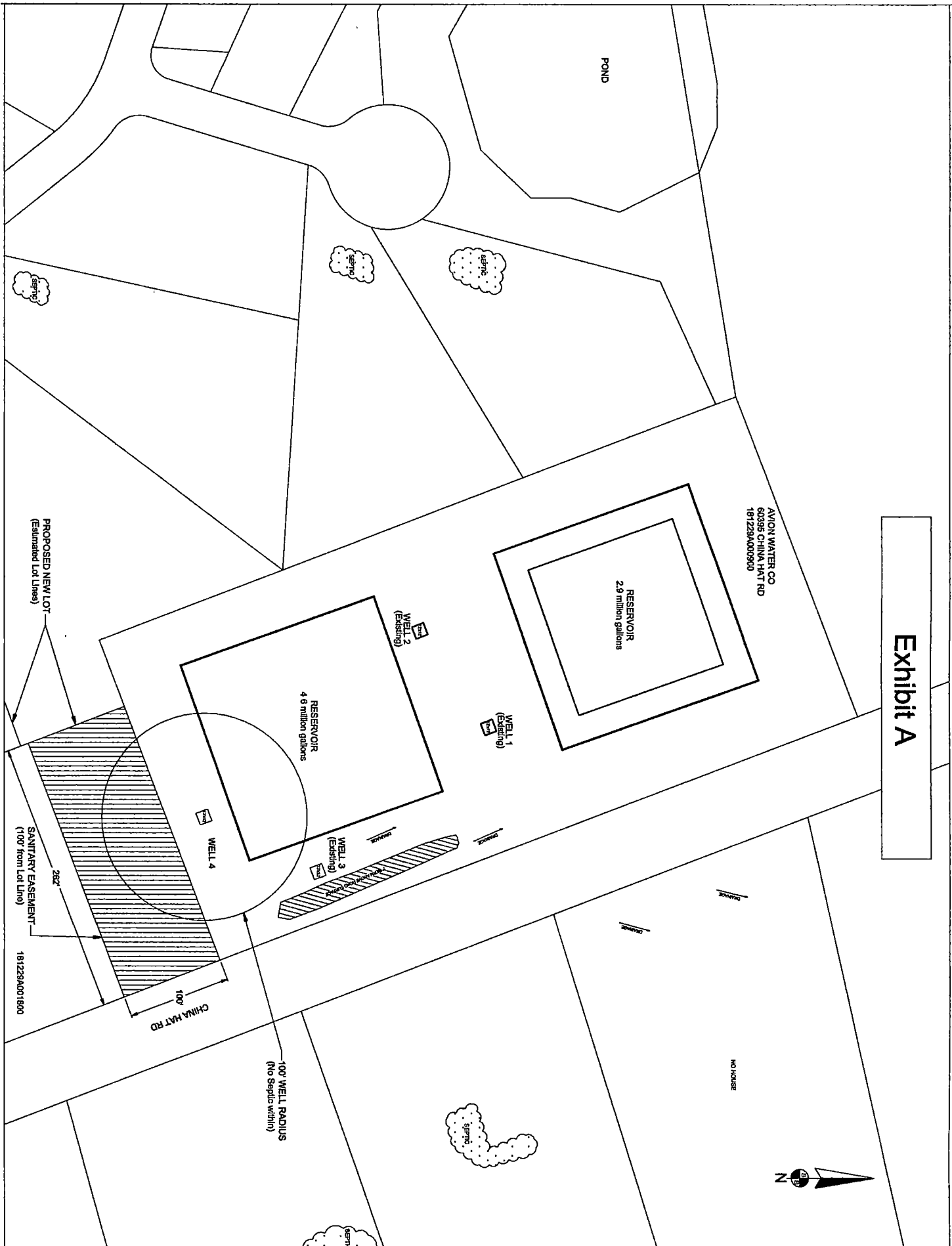
STATE OF OREGON, County of Deschutes) ss.

This instrument was acknowledged before me on February 10th, 2021
by Adam Jackson of Avion Water Company, Inc.



Michael Heffernan
Notary Public of Oregon
My commission expires October 16th, 2021

Exhibit A



From: Jason Wick <jason@avionwater.com>
Sent: Wednesday, February 06, 2013 2:51 PM PST
To: EKing@ci.bend.or.us <EKing@ci.bend.or.us>
Subject: RE: Utility fee

Thank you Eric, I appreciate you taking that time out of your busy schedule to look at this. - Jason

From: EKing@ci.bend.or.us [mailto:EKing@ci.bend.or.us]
Sent: Wednesday, February 06, 2013 10:08 AM
To: Jason Wick
Cc: GFirestone@ci.bend.or.us; THickmann@ci.bend.or.us; JEngels@ci.bend.or.us; RGrayson@ci.bend.or.us; MOberst@ci.bend.or.us; JSkidmore@ci.bend.or.us
Subject: Re: Utility fee

Hi Jason,

Please know that I have instructed our Community Development Department to not charge fees for this permit. I would also be fine developing an agreement with you to not charge fees for other right of way work in the future (although we still would want you to go through the permitting process to ensure we are able to track the work being done). I'll work with our attorney to draft up a side agreement for your review. It would be easier to handle that way instead of amending the existing franchise agreement. Let me know if you are okay with this approach and/or have any questions.

Thanks,

Eric King
City of Bend
City Manager
541-388-5505

- Forwarded by Jennifer Engels/Bend on 02/05/2013 01:43 PM -----

Jason Wick <jason@avionwater.com>

To: "CityManager@ci.bend.or.us" <CityManager@ci.bend.or.us>,

cc

Subject: Utility fee

02/05/2013 07:42 AM

Hi Eric, Avion was in the process of getting a permit for the work we need to do ahead of the Reed Mkt. project when someone charged us for a "utility use" fee. Apparently this fee came about because contractors for other utilities were doing poor quality work. Avion has always done quality work and the City has never asked us to fix something that was not promptly fixed. I would like to be exempt from this fee or have it in our franchise agreement that we are exempt. Thank you-

Jason Wick, PE
President
Avion Water Company, Inc.

PUBLIC RECORDS LAW DISCLOSURE: Emails are generally public records and therefore subject to public disclosure unless exempt from disclosure under Oregon Public Records Law.

Emails can be sent inadvertently to unintended recipients and contain confidential or privileged information. If you are not the intended recipient (or authorized to receive for the recipient), please advise by return email and delete immediately without reading or forwarding to others. Thank you.

From: Jason Wick <jason@avionwater.com>
Sent: Wednesday, January 29, 2014 9:03 AM PST
To: AHenson@ci.bend.or.us <AHenson@ci.bend.or.us>
CC: Mike Heffernan <mike@avionwater.com>
Subject: ADU's
Attachment(s): "ADU Policy.doc"

Does the attached document make everyone happy? - Jason



AVION WATER CO INC.

60813 Parrell Rd • Bend, OR 97702 •
Ph: 541-382-5342 • fax: 541-382-5390 • Email: avion@avionwater.com

To: Aaron Henson, AICP | Senior Planner
Community Development Department
City of Bend

From: Jason Wick
President
Avion Water Co. Inc.

RE: Auxiliary Dwelling Units (ADU's)

Dear Aaron,

Avion Water Company, Inc. requires a separate water service for any "ADU" created in Avion's Service territory. The fees and deposits for the "ADU's" will be determined at the time of application for water service. Avion requests that the City require a ADU applicant to have a "willing and able to serve" letter from Avion prior to acceptance.

Thank You,

Jason Wick, PE
President
Avion Water Company, Inc.

From: Jason Wick <jason@avionwater.com>

Sent: Wednesday, July 18, 2018 11:57 AM PDT

To: eking@ci.bend.or.us <eking@ci.bend.or.us>; thickmann@bendoregon.gov <thickmann@bendoregon.gov>; Kyle Thomas <kthomas@bendoregon.gov>; Casey Roats <casey@roatswater.com>

CC: Adam Jackson <Adam@avionwater.com>

Subject: New paving standards

Hi All, the new paving standards are not possible for Avion to meet. The issue is a 5 year moratorium on cutting pavement as trenchless technology is not possible for Avion to use in most cases. Additionally Oregon law allows me to use rights of way in this state and since I cannot bore I need a standard that is possible to meet. We had this same issue with the County and agreed to provide a fifty foot patch at each crossing we need to do on new pavement. It seems like we can use this standard if you guys agree to change the current specs. Also on a side note I believe our franchise agreement requires you guys to impose this rule on your water utility as well as us since it is most certainly a large cost.

Please let me know how we move forward.

Thanks – Jason Wick

**This is an electronic copy. Attachments may not appear.
BEFORE THE PUBLIC UTILITY COMMISSION**

OF OREGON

WA 5

In the Matter of the Application by	}	
Avion Water Company for Allocation)	
of Exclusive Territory to Provide)	ORDER
Water Service, Pursuant to)	
ORS 758.300 Through ORS 758.320.)	

DISPOSITION: APPLICATION GRANTED

On January 20, 2000, Avion Water Company (applicant, utility or Avion) filed an application with the Public Utility Commission (Commission) for an allocation of exclusive service territory for the provision of water service under Oregon Administrative Rule 860-036-0900. Applicant is requesting allocation of the service territory it adequately and exclusively served on October 23, 1999. See ORS 758.300 and Chapter 695, Oregon Laws 1999, Sections 2 to 4. The territory sought is described in Appendix A. The Commission gave notice of the application on February 16, 2000, as required by Chapter 695, Oregon Laws 1999, Section 2(2). No requests for hearing were filed.

Applicant is an investor-owned water system that provides water service to approximately 7,700 residential, commercial/industrial and irrigation customers near Bend, Oregon.

Based on its investigation, the Commission finds that the applicant was adequately and exclusively serving the territory described in Appendix A and covered by the current service territory application on October 23, 1999.

FINDING OF FACTS

Merits of the Application

Staff's analysis of the company's application indicates that the company has met the criteria required to demonstrate it was adequately and exclusively providing water service to its current service territory as required in OAR 860-036-0900 through OAR 860-036-0930.

The criteria are:

1) Service Quality

The Commission's Consumer Services Division found that since January 1994, Avion customers filed 143 complaints. All of these complaints have been resolved with only 12 faults attributable to Avion. Given the near 8,000-customer base, the small number and variety of complaints over a six-year period, there is no appearance of system wide quality problems.

2) Water Quality

A January 31, 2001 records check by the Oregon Health Division showed acceptable water quality.

3) Water Capacity

The peak demand reported during 1999 was 9,500,000 gallons per day while the system capacity is 14,000,000 gallons per day. There is sufficient reserve.

4) Technical Ability

The corporate president is an Oregon registered professional civil engineer. Employees have certifications in water distribution (levels 1 through 3), backflow device testing, and cross connection inspection. Electrician licenses are also held.

5) Exclusive Service

Documentation evidencing land ownership and a water service franchise from the City of Bend were submitted.

6) Reasonable Rates

The Commission approved the current rate schedule in Docket UW 50, Order No. 96-030.

OPINION

Jurisdiction

ORS 757.005 defines a public utility as "any corporation, company, individual, association of individuals, or its lessees, trustees, or receivers that owns, operates, manages or controls all or a part of any plant or equipment in this state for the production, transmission, delivery or furnishing of ...water... directly or indirectly to or for the public."

Applicable Law

The 1999 Oregon Legislature enacted ORS 758.300 through 758.320, which provide that all public water utilities must file an application with the Commission seeking an order designating the service territory that the utility served adequately and exclusively on October 23, 1999, as its exclusive service territory.

On April 11, 2000, the Commission adopted permanent rules (OAR 370) governing the allocation of exclusive service territory to water utilities. OAR 860-036-0900 through OAR 860-036-0930 specify the service territory application requirements and processes necessary to meet the requirements of ORS 758.300 through ORS 758.320.

Disposition

Applicant has met the service territory requirements and processes set out in OAR 860-038-0900 through OAR 860-036-0930 and is entitled to the exclusive territory described in Appendix A.

CONCLUSIONS

1. The Company is a public utility subject to the service territory jurisdiction of the Public Utility Commission.
2. The utility meets the requirements set out in OAR 860-036-0900 through OAR 860-036-0930.
3. The Company meets the requirements of ORS 758.300 through ORS 758.320.
4. The application should be granted.

ORDER

IT IS ORDERED that the application of Avion Water Company for exclusive water service territory as allocated to the applicant and set forth in Appendix A is granted.

Made, entered, and effective _____

Phil Nyegaard
Acting Director
Utility Program

A party may request rehearing or reconsideration of this order pursuant to ORS 756.561. A request for rehearing or reconsideration must be filed with the Commission within 60 days of the date of service of this order. The request must comply with the requirements of OAR 860-014-0095. A copy of any such request must also be served on each party to the proceeding as provided by OAR 860-013-0070. A party to a hearing may appeal this order to a court pursuant to ORS 756.580.

APPENDIX A

Description of Avion Water Company's exclusive service territory:

Sections 23 and 25 T14S R12E; Sections 19, 20, 21, 29, 30 and 31 T14S R13E; Sections 25 and 36 T15S R12E; Sections 30 and 31 T15S R13E; Section 36 T15S R14E; Sections 30 and 31 T15S R15E; Sections 1, 2, 9, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35 T16S R12E; Section 31 T16E R13E; Sections 1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 35 and 36 T17S R12E; Sections 17, 18, 19, 20, 27, 28, 29, 30, 32, 33 and 34 T17S R13E; Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30 and 31 T18S R12E; Sections 13, 23, 24, 25, 26 and 36 T18S R11E; Sections 2, 3, 4, 5, 6, 7, 8, 9, 11, 15, 16, 17, 18, 19, 20, 21, 22, 30 31 and 32 T18S R13E; Section 23 T21S R09E, W.MM



Advisory Report

State Leadership Must Take Action to Protect Water Security for All Oregonians

January 2023
Report 2023-04



Secretary of State
Shemia Fagan



Audits Director
Kip Memmott

Table of Contents

Executive Summary	2
About the Project.....	5
What Does Water Management Look Like in Oregon?	6
Oregon faces daunting water security concerns as climate change advances	7
Working with water from a governance standpoint is a complex and difficult undertaking.....	10
Oregon water policy is not designed to be equitable.....	14
The Past is Prologue: The Klamath Tribes.....	18
What Has Oregon Done in the Past to Address Issues of Water Governance?	22
The introduction of Oregon’s Water Code in 1909 was borne out of a need to manage the resource for the new state	22
Since the 1950s, Oregon has several times attempted to overhaul statewide water planning and management, but never developed a comprehensive plan	23
Oregon’s most recent initiatives hold promise, but there is much more work to do	29
What Does Oregon Need to Do Now?.....	30
Timely and decisive action is needed to address deficiencies in Oregon’s water governance and improve water security and equity	30
What could an Oregon water framework look like?	35
Many important aspects of water governance need to be considered when developing a state framework.....	36
Good water governance supports a healthy state economy	43
Local Perspectives: North Coast Region	48
Local Perspectives: Harney County	54
Local Perspectives: Lower Umatilla Basin	61
Federally recognized Tribes must be integrated as full and equal partners and co-managers in state water decision-making	66
What Are Our Recommended Actions?.....	71

Executive Summary



Water insecurity is a reality for many Oregon residents and a growing risk for many more. Ongoing drought conditions and concerns around the quality, safety, and accessibility of water have demonstrated the need for better governance to protect Oregon's water security. This advisory report addresses gaps in Oregon's water governance that can lead to or worsen water insecurity and lead to inequitable outcomes for higher-risk communities. We offer suggestions for state leadership on how to improve these gaps in governance.

The state has made some efforts to address water security concerns. The passage of House Bill 5006 in 2021 led to significant investments in local infrastructure projects, increases in agency staffing, and the creation of the State Supported Regional Water Planning and Management Workgroup. Several state agencies have demonstrated a commitment to finding broad, cross-cutting solutions to water security concerns through ongoing efforts to improve water data, include more diverse communities in decision making, and engage in planning and coordination.

While these developments hold promise, Oregon is underprepared to provide meaningful support to many communities facing water insecurity and has more work to do to meet the state's immediate and long-term water security and water equity needs.

The following aspects of Oregon's water governance need urgent attention:

Oregon communities facing water insecurity often encounter numerous barriers to addressing the problem directly. The state has a fragmented and siloed institutional structure around water that can make it challenging to apply cross-agency and multi-level solutions to local problems, and there is not a clear framework in place to support multi-level coordination. State water policy also prioritizes water access for senior water right holders and does not fully account for the complexity of the resource or its relationship to ecosystem health.

- Many communities are not fully integrated into water decisions and often not even aware there is a problem.
- The Oregon Integrated Water Resources Strategy is not clearly connected to state and regional planning efforts and does not have clear implementation pathways.
- Oregon's state leadership and agencies do not necessarily share water security priorities. Agencies have distinct areas of focus and limited resources and capacity that limit the ability to engage broadly with communities or work across agency lines.
- Oregon water data is disaggregated, sometimes incomplete, and not set up to support regional governance needs.
- Oregon lacks a water funding strategy that ties state and regional planning to investments. The state's water infrastructure suffers from decades of disinvestment and natural resource agencies lack funding and capacity to properly enact their duties.
- State water regulatory agencies have broad discretion but face external pressures that may hinder them from fully using this discretion to benefit the public.

Furthermore, while Oregon's federally recognized Tribes are proactive in addressing water insecurity, a history of oppression and ongoing industrial and agricultural practices ecologically inappropriate for Oregon's water basins has undermined their ability to ensure water security in their homelands.

Oregon must adopt integrated and holistic policies and practices based on principles of good water governance

The Oregon Legislature and Governor's Office, in coordination with state agencies that work with water, must commit to developing a robust state and regional framework. The framework should be centered on meeting public needs and applying holistic and scientifically sound water management practices. It should incorporate the principles of good water governance to enhance water security and equity. Specific needs addressed in the report include:

- Developing priorities centered on water security and equity shared by state leadership and agencies that can guide decisions based on a statewide, integrated approach.
- Connecting an actionable and equitable state-level water plan based on shared priorities to regional planning.
- Convening a formal planning and coordination body with diverse representation to guide the statewide plan and provide consistent support to regional planning and other governance needs.
- Defining clear agency roles and responsibilities within a state and regional framework to ensure there is no operational overlap or gaps in service.

- Balancing interests and addressing high-priority water needs by integrating more communities into statewide and regional management decisions.
- Enhancing public awareness of the state’s water challenges.
- Prioritizing the human right to water in state policy and exploring policy changes that could better protect community and ecosystem health.
- Improving water data to support strategic decision making within a state and regional framework.
- Adopting a strategic approach to funding and a consistent funding base to support desired outcomes.
- Supporting state agencies in carrying out their regulatory responsibilities.
- Integrating Oregon’s federally recognized Tribes as full and equal partners into state and regional water decision-making.

Our goal is for this report to inform state leadership and support additional changes needed to protect water security for all. We hope state leadership can maintain the momentum of recent actions taken to address Oregon’s water needs and build on past and ongoing efforts of state agencies, communities, stakeholders, and Tribes to craft a robust approach to water governance that can support the needs of current and future generations.



Community members meet in Morrow County to discuss needed response to nitrate-contaminated groundwater, summer 2022.

About the Project

Following several years of drought and growing concerns about water in the State of Oregon, the Oregon Audits Division planned to launch an audit in 2021. The division determined there were water governance and equity concerns that needed to be addressed to protect water security for all Oregon residents. However, without a single lead agency for water governance and with an identified need to address state water policy, the Division opted to direct an advisory report to the Oregon Legislature and Governor's Office, rather than conduct an audit under Government Auditing Standards.

This report addresses specific systemic gaps in Oregon's water governance that can create or worsen water insecurity and lead to inequitable outcomes for higher-risk communities. This report is not intended to provide a comprehensive review of all water risks or concerns faced by the state.

The division spoke with several state agencies, legislators, the Governor's natural resources team, local and county government representatives, academic researchers, nonprofits and community-based organizations, three Oregon Tribes, community members, and a variety of other water stakeholders.

The division would like to thank Oregon state agencies and other stakeholders for their cooperation on this project — in particular, we appreciate the assistance and support of the Oregon Water Resources Department, the Department of Environmental Quality, the Oregon Watershed Enhancement Board, the Oregon Health Authority, and Business Oregon. We would also like to extend our gratitude to the Klamath Tribes, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians, community members in Harney County, the Lower Umatilla Basin, and the North Coast region of Oregon, and community-based organizations North Coast Communities for Watershed Protection and Oregon Rural Action for their assistance, support, and guidance on this project.

Audit Team

Olivia Recheke, MPA, Audit Manager

Bonnie Crawford, MPA, Senior Auditor

Wendy Kam, MBA, CFE, Staff Auditor

Ariana Denney, MPA, Staff Auditor

About the Secretary of State Audits Division

The Oregon Constitution provides that the Secretary of State shall be, by virtue of the office, Auditor of Public Accounts. The Audits Division performs this duty. The division reports to the elected Secretary of State and is independent of other agencies within the Executive, Legislative, and Judicial branches of Oregon government. The division has constitutional authority to audit all state officers, agencies, boards and commissions as well as administer municipal audit law.

What Does Water Management Look Like in Oregon?

Water is life. Water impacts nearly every part of our lives and is essential for human survival. People depend on regular access to water to serve a variety of needs. In Oregon, these needs include water for drinking, agriculture, industry, recreation, hydropower, and ecological and cultural stewardship.

Despite Oregon's reputation for being rainy and wet, two-thirds of the state consists of arid high desert with hot, dry summers like those seen across much of the western United States. Communities in Central and Eastern Oregon have long dealt with limited water, but with the advancement of climate change, a perennial concern for many has evolved into an ongoing crisis.

Communities in Oregon's temperate coastline and Willamette Valley are also struggling; demand for local water resources sometimes outstrips supply. Across the state, water quality can be compromised by improperly regulated agricultural and industrial practices and by increasing water temperatures brought on by high water demand, declining overall precipitation and snowpack and natural water storage, and increasingly hot summers.

Oregon has also been hit by the same megadrought that is incapacitating other parts of the western United States. The megadrought started in 2000 and is the worst to hit the region in 1,200 years. The past 22 years have been the driest on record in the western United States.

There is a broad spectrum of potential causes that lead to water insecurity, and some communities are more vulnerable than others. Many communities in Oregon are at high risk of becoming water insecure in the very near future, if they are not already. An incomplete list of these risks includes:

- Climate change
- Aging infrastructure or poor water quality that can lead to health issues for affected communities
- Communities unable to afford clean and safe water for domestic needs
- Seismic events including the Cascadia earthquake that threaten water infrastructure and services
- High demand and shrinking supply threaten the state's ability to meet all water needs
- Unpredictable federal and state funding
- Competing interests in water driven by differing values
- Highly litigious environment
- Antiquated, incomplete, and non-integrated water data systems which slow decision making
- Western water law disincentivizing cooperation and conservation
- Limited public knowledge of water issues in Oregon
- Limited community representation around water planning and decision-making
- Over-allocation of water resources
- Rapidly declining groundwater from agricultural, industrial, and municipal overuse in several areas of the state

The array of risks faced by different communities makes working to ensure water security at the state level a challenge. Thoughtful, well-coordinated action to address the causes and the impacts of water insecurity is critically important.

What is Water Security and Water Equity?

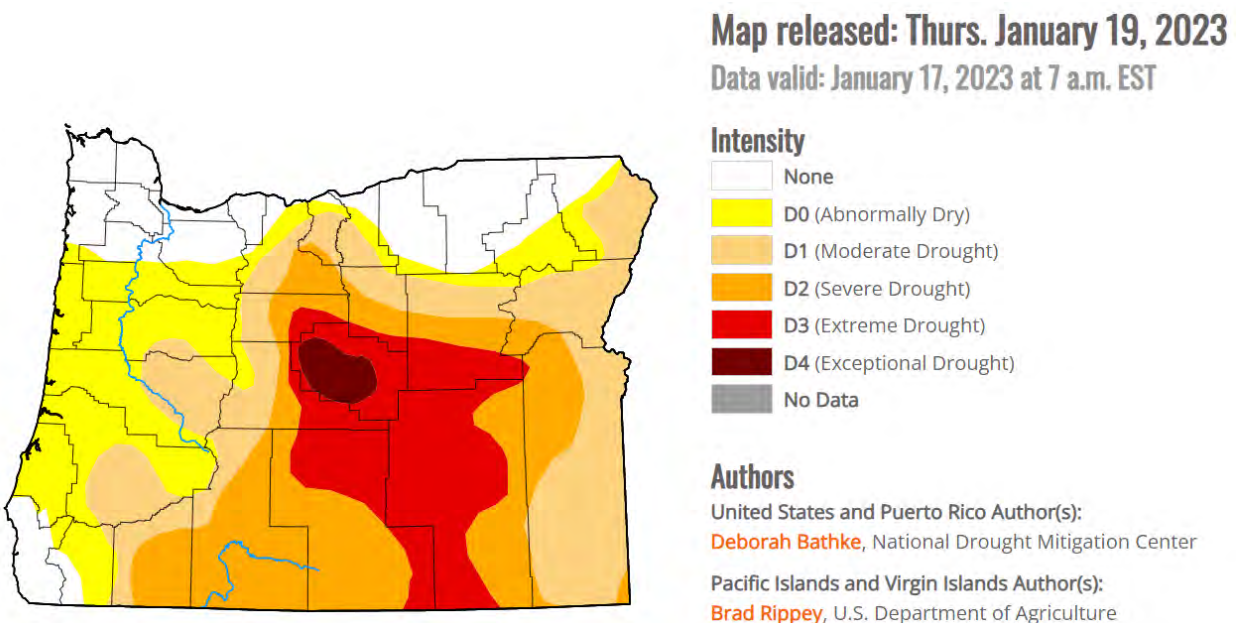
Water security and water equity are assurances that water is safe, clean, available to use for basic human and ecosystem needs, and by all people. For the purposes of this report, we use the United Nations' definition of water security, which describes the ability of communities to access adequate, safe, clean water to sustain human well-being, protect livelihoods and socio-economic development, protect against pollution and water related disasters, and preserve ecosystems.

At the recommendation of the Confederated Tribes of the Umatilla Indian Reservation, the Audits Division has expanded this definition of water security to include the ability of communities to interact with water, not simply access it, for these purposes. The U.S. Water Alliance further expands on this definition by stating water equity occurs when these conditions are enjoyed by all communities. For Oregon's water system to be both equitable and secure, these conditions need to be met.

Oregon faces daunting water security concerns as climate change advances

One major threat to Oregon's water security is climate change. Climate change is both a cause and a complicating factor for other causes of water insecurity. It is a clear and present danger to people and ecosystems and affects our natural environment in broad and sometimes unexpected ways. For example, climate change leads to larger and more intense wildfires that affect air and water quality, resulting in poor public health and the displacement of communities.

Figure 1: As of January 19th, 2023, over 80% of Oregon was still in drought or abnormally dry



Source: U.S. Drought Monitor

According to the 2023 Sixth Oregon Climate Assessment, Oregon’s annual average temperature has already increased by 2 degrees Fahrenheit since 1895 and is expected to increase by an additional 5 degrees Fahrenheit by the 2050s and over 8 degrees Fahrenheit by the 2080s if greenhouse gas emissions continue at current levels.¹ The greatest seasonal temperature increases are expected to occur during the summer months.

Climate change also affects the water cycle, and Oregon’s precipitation profile is changing fast. Precipitation is projected to increase during the winter and decrease during the summer. The number and intensity of heavy winter precipitation events will likely increase, and more water will arrive as rain rather than snow. The frequency and likelihood of droughts is also growing.

According to a 2019 University of Maryland report, by the year 2080, hundreds of North American cities are anticipated to become climatically similar to contemporary cities 525 miles to the south, should carbon emissions continue unabated. Portland, Oregon’s closest 2080 analog is the city of Lincoln, California, located just outside of Sacramento. On average, Lincoln is 6 degrees Fahrenheit (3.6 degrees Celsius) warmer than Portland and over 30% drier in winter months.

Changes to one part of the water cycle have cascading effects — warmer winters and declining snowpack in Oregon and other western states has already led to less water in lakes, rivers, and aquifers during summer, when demand from cities and farms is at its peak. This puts greater stress on available water resources and can lead to other issues, including more intense droughts and disputes over water access and management. When winter precipitation arrives as rain rather than snow, or there is significant rain after a long period of drought, the risk of seasonal flooding may also increase. Wildfires lead to more erosion of watersheds; higher water temperatures in streams, rivers, and lakes lead to species loss and habitat destruction.

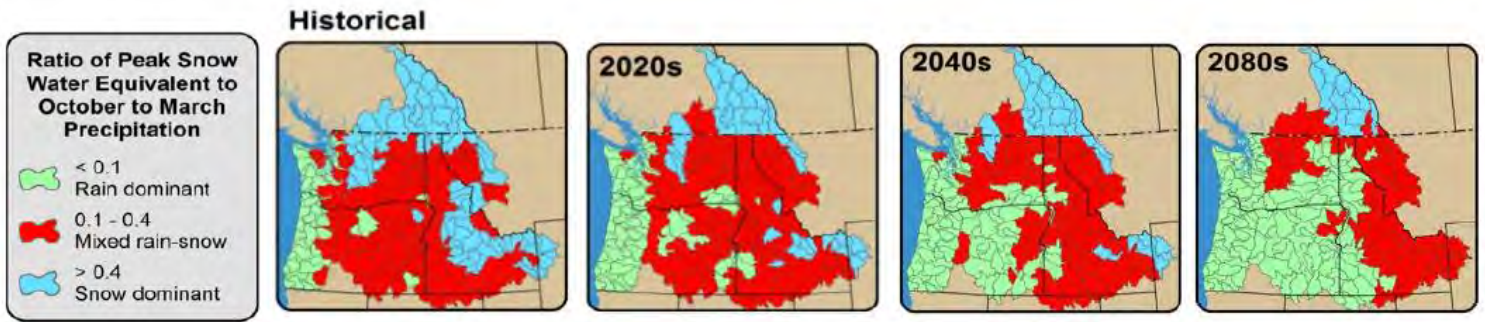
Changes in the water cycle, hotter temperatures, and certain agricultural and industrial practices also contribute to degrading water quality in lakes, streams, and aquifers around the state. Cyanobacteria (harmful algae) blooms, brought on by warmer water and the presence of pollutants like phosphorus, threaten drinking water and fish habitat. Areas of the state dependent on well water to meet domestic needs are seeing wells not only dry up but be impacted by the presence of nitrates, arsenic, and other pollutants harmful to humans and animals. Concerns have also been raised recently about the presence of PFAS² in domestic water supplies. The combination of low water availability and poor water quality can be dangerous for communities and ecosystems and difficult to fix.

Oregon’s 2017 Integrated Water Resources Strategy showed the form precipitation takes in Oregon is anticipated to shift drastically from a mix of rain and snow to primarily rain across the state in the coming decades.

¹ The Oregon Climate Assessment is released by the Oregon State University Oregon Climate Change Research Institute: [Fleishman E., editor. 2023. Sixth Oregon Climate Assessment. Oregon Climate Change Research Institute, Oregon State University, Corvallis, Oregon.](#)

² Per- and Polyfluoroalkyl Substances, commonly known as PFAS, are widely used long lasting chemicals that break down very slowly over time. There are thousands of PFAS chemicals found in consumer, commercial, and industrial products that have made their way into water, air, fish and soil across the globe and may be linked to harmful health impacts in humans and animals. [Per- and Polyfluoroalkyl Substances \(PFAS\) | US EPA](#)

Figure 2: By the 2080s, most of Oregon may depend upon rainfall and receive very little snow



Source: [An Overview of the Columbia Basin Climate Change Scenarios Project: Approach, Methods, and Summary of Key Results](#)

Extreme events have become more commonplace. Since 2019, Oregon has witnessed some of the worst climate-driven natural disasters in its history. The 2020 Labor Day fires burned 11% of the Oregon Cascades, more acreage than had burned in the previous 36 years combined, destroyed communities and ecosystems, and took lives. The impacts from events like this on Oregon’s more vulnerable communities — low-income, underinvested rural, people of color, and Tribal communities — could be severe and long-lasting, and lead to greater incidents of homelessness, food insecurity, and poor mental and physical health.

Other parts of the country are already facing severe water challenges made worse by climate change. A century of overuse and poor water management decisions, combined with reduced snowpack and reduced flow in stream, has created a water crisis in the Colorado River Basin that already impacts millions of people.

As directed by the U.S. Bureau of Reclamation, the seven states and certain Tribes that rely heavily on water from the Colorado River must reduce their water consumption by up to 4 million acre-feet in 2023, or risk losing water in the basin almost entirely.³ These states failed to come to an agreement within the 60-day period granted by the federal government, which led to further administrative actions aimed at improved reservoir management across the basin. Funding from the Inflation Reduction Act has helped create the Lower Colorado River Basin System Conservation and Efficiency Program with the aim of increasing water conservation and improving water efficiency to prevent key reservoirs from hitting critical levels. The extreme drought may also lead to federally mandated water cuts to states and Tribes to protect Lake Powell and Lake Mead, which provide water and power to 40 million people in the Southwest and have dropped dangerously low. This situation is still developing.

These events are likely to become more frequent and hit closer to home without swift, decisive, and drastic local and global action to mitigate our climate impacts and adapt to changes as they occur. Considering the changes that are already occurring in Oregon — our climate is getting warmer and drier, and extreme weather events are becoming more frequent and devastating — acting now to protect water security for all is a necessity.

³ Water is commonly measured in acre-feet. One acre-foot equals about 326,000 gallons, or enough water to cover a football field one foot deep. Four million acre-feet is the equivalent of almost 2 million Olympic-sized swimming pools.

Working with water from a governance standpoint is a complex and difficult undertaking

Because water is dynamic and moves from one location to another, the responsibility for directly managing water can change hands numerous times, depending on where the water is and what are the local needs and conditions. The flow of water is not based on and does not observe jurisdictional, state, or national boundaries. Coordination among many jurisdictions and players is critical, though it may be difficult to accomplish in times of water shortage or increased need. Guidance on how best to manage water and create workable water governance systems at a state level exists to a degree, but states have distinctly different water needs and challenges. The many differences in state-level policy and practice can make comparisons difficult and establishing and applying best practices even more so. Water is also controversial, and discussions about water management or proposed policy changes are often fraught with conflict.

Oregon's water governance is multi-layered, and its institutional structure is decentralized

Water as a resource is subject to many layers of governance: local districts, cities and counties, state agencies, federal agencies, and international treaties and state to state compacts all play a role. Water governance in Oregon is largely decentralized at the state level. State and local entities operate under a complex network of state and federal laws and policies.

Oregon has numerous state agencies that play a role in managing, regulating, and planning for water and its uses across the state; responding to emergency situations such as floods; or creating and implementing policies that could impact water resources. Key state agencies involved include the **Water Resources Department (WRD)**, which oversees water allocation and permitting and has played a role in many different water planning efforts over the years; the **Department of Environmental Quality**, which is the key agency responsible for protecting water quality; and the **Oregon Health Authority Drinking Water Services** program, which is responsible for protecting community drinking water.

The **Governor's Office** and **Oregon Legislature** also play important roles when it comes to decision-making, coordinating, and funding for Oregon's water resources.⁴

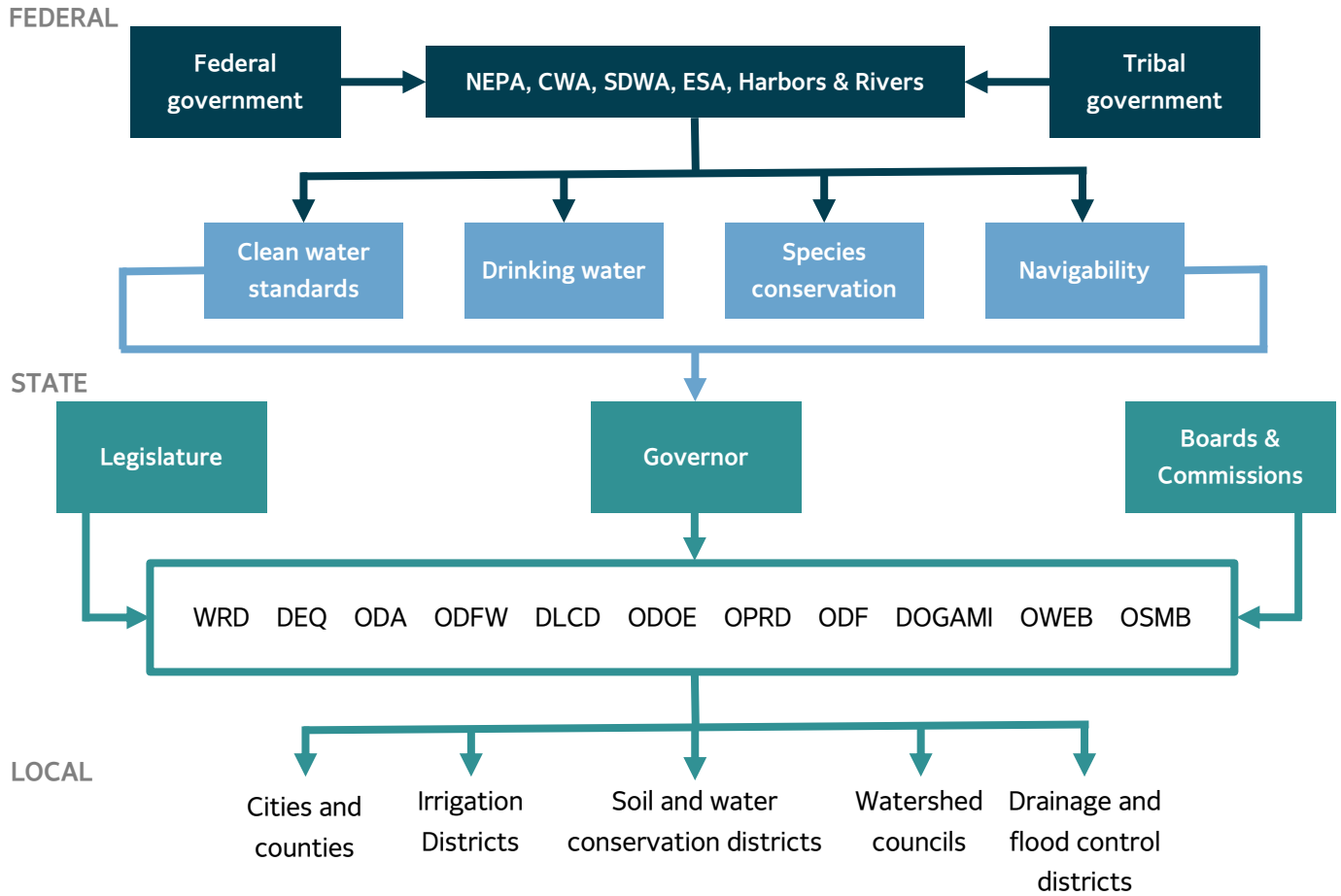
Some other state agencies are not included in Figure 3 but play roles in Oregon's water governance and participate in the state's informally convened Water Core Team,⁵ including Business Oregon and the Oregon Department of Transportation.

Unlike some other states, Oregon does not have a formalized interagency structure or a central Department of Natural Resources to help guide major water decisions and policy. Whether such a structure is necessary is a matter of debate. Having multiple separate agencies responsible for isolated pieces of water management complicates efforts to coordinate across agency lines; however, allowing agencies to focus on their respective pieces of water management may avoid unnecessary delays in the performance of their duties. Both functions are critical to effectively managing water.

⁴ See [Appendix G in the attached document](#) for full list of state agencies in Oregon with a notable nexus to water.

⁵ The Water Core Team is discussed in greater detail later in this report.

Figure 3: Oregon's institutional water structure involves many players



Source: Dingfelder, Jacqueline, "Wicked Water Problems: Can Network Governance Deliver? Integrated Water Management Case Studies from New Zealand and Oregon, USA" (2017). Dissertations and Theses. Paper 3623.

To coordinate different aspects of water management, such as drought response, Oregon depends on several formal and informal coordination mechanisms. These include task forces formally convened by the Legislature, and groups like the Water Core Team initiated by state agencies attempting to improve cross-agency decision-making.

Numerous local and regional bodies and the federal government also play key roles in water management; these include cities and counties, irrigation and other kinds of special districts, federal agencies, and private landowners. Private industries, such as large agricultural operations, also play a significant role in water management and governance.

Federal involvement in water governance is largely decentralized. Several federal agencies play key roles in aspects of water management in Oregon, and federal laws like the Clean Water Act direct and inform Oregon's water programming. These agencies include: the Environmental Protection Agency, which has oversight of Oregon's implementation of the Clean Water Act; the United States Geological Survey, which performs research and conducts basin-level surface and groundwater studies; and the Bureau of Reclamation, which funds and operates large water infrastructure projects. More than 20

federal agencies deal with some component of water management. Oregon’s water agencies work closely with the federal government to ensure federal regulations are carried out and federal funding is directed through their programs to address state water needs.

What is Water Governance and Water Management?

Water governance generally refers to administrative systems, with a focus on formal institutions (laws and policies) and informal institutions (relationships and practices) as well as organizational structures and their efficiency. Ideally, water governance includes institutional and policy frameworks that foster transparency, accountability, and coordination.

Water management generally covers a range of operational activities intended to meet specific targets, such as aligning water resources with water supply and use.

The Audits Division is using definitions provided by the Organisation for Economic Cooperation and Development, 2011.

In some situations, the federal government may also play a role in water allocation, though this is generally the responsibility of individual states. Federal agencies are involved in international water negotiations with Mexico and Canada, and some interstate water decisions. For example, the Secretary of the Interior acts as the Watermaster for the lower Colorado River to guide water decisions in collaboration with the Colorado River Basin states, indigenous Tribes in the region, Mexico, agricultural interests, and many other stakeholders. In Oregon, the U.S. Department of State is leading efforts to renegotiate and modernize the Columbia River Treaty with Canada. The Columbia River Basin touches several US states and British Columbia. The treaty covers hydropower, management of flood risk, irrigation and municipal support, navigation, recreation, and ecosystem benefits. Negotiations are ongoing.

While this report focuses primarily on the state’s role in water governance, other players enact key roles and must be taken into account when making water decisions. The challenges and difficulties of state-level water governance and management are shared by all states in the U.S. Institutional frameworks developed to support and guide water management efforts also tend to be unique from state to state. However, Oregon can learn from some practices enacted by other states, particularly around funding, data, and planning, and can take further steps to apply good governance principles to its water policy and practices.

Leading practices advocate for transformative approaches to addressing water security challenges, though this varies in application

To address climate change and other water security challenges, international leading practices advocate for transformative changes in how water is managed — meaning a push toward collaborative, integrative, adaptive, and nature-based approaches — but advise tailoring approaches to local circumstances. In government, there has been a shift from the traditional, top-down regulatory and often siloed approach to water governance and management, toward more integrated and collaborative methods in support of innovation and adaptation. Such approaches as Integrated Water Resources Management require a more holistic view of the resource, incorporating water quantity, quality and ecosystem needs and the multi-level decision-making realities of water management.

Oregon, among other states, has made some attempts to better integrate its water management. However, the state remains largely siloed as agencies often focus on their distinct regulatory responsibilities. Furthermore, the practicality of integrated management has been somewhat limited given the fact governance and water management frameworks will need to accommodate a variety of local needs and circumstances. In fact, there is no universally recognized definition of “water governance,” as researchers use varying conceptions of the term.⁶

Internationally acclaimed water management approaches:

Integrated Water Resources Management

Per the Global Water Partnership:⁷

“Integrated Water Resources Management is a process which promotes the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment.

It involves:

- managing water at the lowest possible level,
- managing demand in addition to supply,
- providing equitable access to water resources through transparent and participatory governance and management, and
- establishing integrated policy, regulatory and institutional frameworks.”

Nature-Based Solutions

The United Nations advocates for a rapid uptake in the use of Nature-Based Solutions to help sustain and improve water availability and quality, while reducing water-related risks, such as those caused by climate change.

“Nature-based solutions are inspired and supported by nature and use, or mimic natural processes to contribute to the improved management of water... The solutions can involve conserving or rehabilitating nature ecosystems and/or the enhancement or creation of natural processes in modified or artificial ecosystems. They can be applied at a personal or micro-level (e.g., a dry toilet) or a macro-level (e.g., landscape) scale.” These solutions include the use of natural infrastructure to meet service needs defined on page 60.

While there are a wide variety of different governance systems and structures, observing certain key principles as discussed further in this report can help ensure the framework in place is robust and serves the needs of the public. United Nations Water has cautioned “Integrated Water Resources Management has been an aspiration for decades, but has often failed due to entrenched sectoral interests, political and governance barriers, and the lack of collective responsibility.”⁸

⁶ For purposes of this report, the Audits Division is using the definition of water governance provided by the Organisation for Economic Cooperation and Development.

⁷ The Global Water Partnership is an action network with over 3,000 partner organizations involved in water resources management in 79 countries. The partnership provides knowledge and builds capacity to improve water management at all levels: global, regional, national, and local.

⁸ United Nations Water is a coordination mechanism for the United Nations’ work on water and sanitation comprised of United Nations entities and international organizations working on water and sanitation issues. Its role is to ensure these entities ‘deliver as one’ in response to water-related challenges.

Oregon water policy is not designed to be equitable

Oregon's Water Code prioritizes water access for right holders and largely excludes other water users

Oregon's Water Code dictates how the state's water may be allocated and for what purpose. To access and use water in Oregon, a potential user may need to secure a water right. Under Oregon's Water Code, right holders have priority access to water. Oregon Revised Statutes 536 through 541 guide state water policy and are codified under two principles: first, all water within the state belongs to the public and is held in trust by the state, and second, water can be appropriated for beneficial use under permit, but is subject to the existence of more senior water rights. This second principle is known as the doctrine of prior appropriation and provides the foundation for water law in most western states. The doctrine can be summarized as 'first in time, first in right.' Priority of access to water is based on the date of the original water claim.



Irrigation water. | Source: CCO Public Domain.

Water rights in Oregon are issued by the WRD after a permitting and review process, during which the application can be subject to public comments and protests. Once granted, water rights are generally considered permanent so long as they continue to be used beneficially under the terms of the right. Water rights are tied to a specific point of diversion from a body of water (such as a stream or lake) and are to be used for a specific purpose in a specific area. They are predominantly held by landowners.

The water rights system prioritizes the needs of senior, or oldest, right holders above more recently granted rights, and above water use by those who do not have water rights, with some exceptions. Oregon law does not clearly outline a preference for kinds of water use and relies on the date of priority to determine who may use the water. Water right holders that have seniority are the last to be shut off during low stream flow. In general, they can access and use their full allocation of water until they are restricted by nature and can use their full allotment without regard for other users. Junior, or newer, right holders may have to restrict their water use to not encroach on the allotment of senior rights holders. The exception is when a drought is declared by the Governor, wherein the Water Resources Commission may give preference to stock and human consumptive needs.

Most domestic water users do not have and do not need individual water rights. Approximately 80% of Oregon residents are serviced by large- or medium-sized community water systems, which are generally protected by water rights and federal water quality legislation. However, residents served by private wells or small community wells, which make up roughly the other 20% of the population, are not necessarily prioritized under state or federal law or regulatory requirements under the Safe Drinking Water Act.

Federal law dictates Oregon's approach to managing water quality, including the Clean Water Act of 1972 and the Safe Drinking Water Act of 1974. Several related natural resource laws can impact water management in Oregon as well, such as local land use laws and forest and agricultural practices.

Fewer protections and a history of racial inequity puts some communities at higher risk

Water insecurity is not new to Oregon, nor does it affect everyone equally. Communities across the state are facing direct and urgent water access and quality concerns, but, as noted by the Oregon Water Futures Project, low-income communities, underinvested rural communities, and communities of color face unique barriers to achieving water security.⁹ Communities that lack access to state decision makers or the resources to confront water insecurity concerns on their own are at risk of not being prioritized in the state's water decisions and not receiving necessary funding to address water infrastructure and planning needs.

Historical policy decisions affecting whether certain individuals could own property in Oregon or even legally enter the state have long been detrimental to non-white communities seeking access to water and water rights. When Oregon's Water Code was introduced in 1909, the United States and Oregon in particular had racist and exclusionary attitudes and policies in place. These include the federal Chinese Exclusion Act, passed in 1882 and remaining in force until 1943, which led to violence and mass expulsions of Chinese migrants living in Oregon.

Additionally, a series of laws passed in the 1840s and 1850s banned Black and mixed-race people from settling in the Oregon territory. The last of these laws was formally repealed in 1926. Tribes that had lived in Oregon for thousands of years were pushed onto reservations in the 1800s, only to face

⁹ The [Oregon Water Futures Project](#) is a collaboration between water and environmental justice interests, Indigenous peoples, communities of color, low-income communities, and academic institutions. Through a water justice lens, the project aims to impact how the future of water in Oregon is imagined through storytelling, capacity building, relationship building, policymaking, and community-centered advocacy at the state and local level.

termination — the immediate withdrawal of all federal aid, services, and protection, as well as the end of some reservations — in the 1950s and 1960s.

These laws and the attitudes that gave rise to their passage prevented many non-white people from acquiring property or living safely in Oregon during a time when most surface water claims across the state were being staked. The majority of surface water rights in Oregon have now been claimed, predominantly for agricultural use and irrigation. Many such rights pre-date the law, going back to the late 1800s during the height of the state’s most exclusionary policies. Water is also overallocated in many areas now, putting pressure on entire basins to this day to seek other sources.



Local Tribe fishing for Salmon at Celilo Falls, 1941. The falls were submerged in 1957 after the completion of the Dalles Dam. The Warm Springs, Yakama, Umatilla, and Nez Perce Tribes lost their ancestral fishing grounds. | Source: Library of Congress, Prints & Photographs Division, Farm Security Administration/Office of War Information Black-and-White Negatives.

Today, several of Oregon’s federally recognized Tribes, the original inhabitants of the land, still seek to secure water rights. Some rural communities around the state are at risk of losing water completely and having to source it from elsewhere. Prairie City in Grant County has seen its community well repeatedly run dry, sometimes for months at a time. In 2021, the city had to truck in water to drink for over three months. Even those under the blanket protection of state and federal law face water insecurity — many Oregon residents on community water systems face increasing pressure to cover monthly water bills, particularly as communities have taken on more of the burden of water infrastructure investment from the federal government over the past few decades. Other residents

have urgent concerns over their water quality and its impacts on human health and well-being and the economic viability of their communities.

For this advisory report, the team considered the perspectives and experiences of communities considered to be at higher risk of water insecurity: domestic well users, underinvested rural communities, communities of color, and Oregon's federally recognized Tribes. Not all these communities have an established presence in water decision-making. They may not even be considered key stakeholders by state agencies charged with regulating, planning for, and managing the state's water. Water policy and management touches many areas and includes a wide variety of affected stakeholders, but in Oregon, not all domestic water users are explicitly protected under federal or state law and may not be systematically considered. The communities we heard from struggle with degraded water quality that could harm community health, dry wells, and unaffordable community water bills.

The Past is Prologue: The Klamath Tribes



The Klamath Tribes call themselves *Ewksiknii*, which can be translated as “people of the waters.” They are a sovereign nation with 5,774 enrolled members as of September 2022, about half of whom live in Klamath County, made up of the Klamath, Modoc, and Yahooskin Tribes. The Klamath Tribes currently hold and manage approximately 5,000 acres of land in noncontiguous parcels near the community of Chiloquin in Klamath County.

The ancestors of the Klamath Tribes inhabited the Klamath basin for thousands of years and they consider the 22-million-acre basin to be their homeland. Native species endemic to the lake, including the C’waam and Koptu (two species of suckerfish), are considered centrally important First Foods.¹⁰ The Klamath creation story compels the Klamath to protect the suckerfish. Historically, they shared the basin with other tribes, including the Yurok and Karuk Tribes located along the Klamath River in present day California.

Settlement had dramatic impacts on the Klamath Tribes and the ecology of the region

After white settlers began entering the region in growing numbers, the Klamath, Modoc, and Yahooskin-Paiute entered into a treaty with the federal government in 1864. The tribes ceded 20 million acres to the United States and retained an allotment of 2 million acres, where they would retain full rights to hunt and fish and could restrict access to their land and water by incoming settlers. Between 1864 and 1954, the Tribe’s allotment would be chipped away to approximately 575,000 acres.

The 1864 allotment protected Tribal access to Upper Klamath Lake but did not protect it or the two larger lakes downstream, Lower Klamath Lake and Tule Lake, from development. At the time, the three lakes were among the largest in the western states, with significant biological diversity. This lake system is also part of the Pacific Flyway used by millions of migratory birds.

In 1905, the federal Bureau of Reclamation drained the two lower lakes to be converted into 200,000 acres of farmland and encourage more ranching and crop cultivation in the region. The Upper Klamath Lake was turned into a reservoir to be used by irrigators downstream. Settlers moved into the region in larger numbers to raise cattle and grow crops. They tended to use water-intensive agricultural practices potentially appropriate for the more humid eastern states, but not suitable for the Klamath Basin.

The Klamath Tribes sought out ways to protect their cultural identity and support their people, and during World War II established a robust and lucrative local lumber industry that made them one of the wealthiest tribes in the nation at the time.

¹⁰ First Foods were the foods eaten by indigenous communities in North America prior to the arrival of European settlers. Many are still eaten to this day. First Foods serve an important role in Tribal health, well-being, and cultural identity.



Left: A photograph of the Klamath Basin Project. | Source: Oregon Encyclopedia

Right: The ancestral lands of the Klamath, Modoc, and Yahooskin covered over 20 million acres. | Source: Klamath Tribe

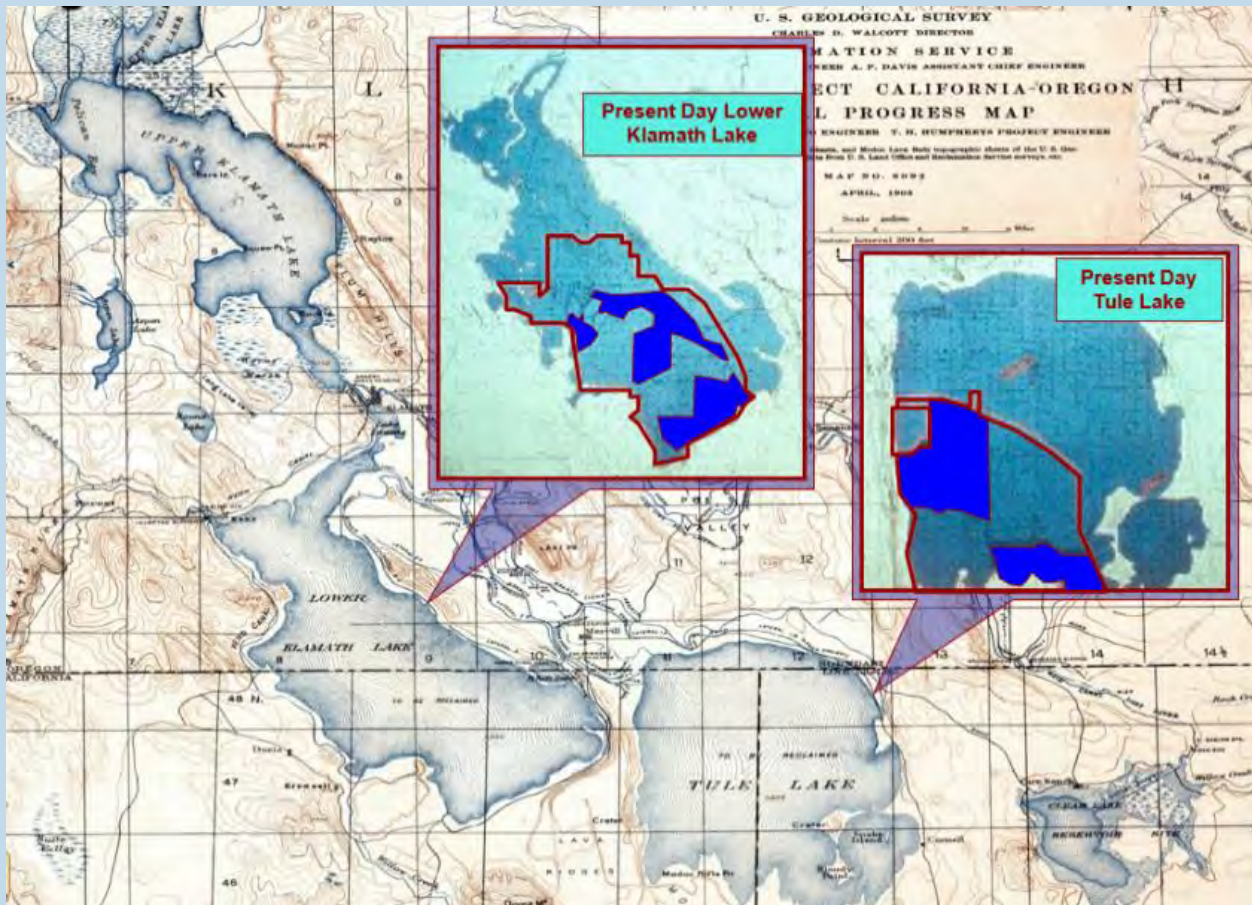
Though senior water rights were recently granted, lands taken from the Tribe after Termination have not been restored

In 1954, Congress passed the Klamath Termination Act despite Klamath Tribal members voting against it. According to the Tribe, termination was “about getting access to their forest lands.”

The federal government took the Tribe’s remaining 575,000 acres. Many people moved away. The bulk of the reservation lands were converted into the Fremont Winema National Forest, and much of the remaining land was sold to private landowners. Tribal fishing, hunting, and gathering rights were also restricted for much of this period. When federal recognition was restored to the Klamath Tribes in 1986 after decades of lobbying, no land was returned with it. The Tribe had only retained a few hundred acres. That same year was the last year that the Tribe was able to catch suckerfish in the lake and in local rivers — both suckerfish species were declared endangered in 1988. With widespread and ongoing practices such as free-range cattle feeding, which can degrade streambanks and causes phosphorus to leach into the lake when cattle are not fenced out of streams, Upper Klamath Lake was quickly losing ecological viability.

The Tribe began to purchase and acquire small parcels of land around Klamath County and participated in the process of water rights adjudication. In 2013, after decades of lobbying and arbitration, the Tribe was granted time immemorial water rights, making them the senior right holder in the Basin. Recent efforts between the Tribe, farmers, and local and state governments to come to an agreement over the best use of water have been largely unsuccessful.

As of 2022, the Klamath Tribes still held less than 1% of the land they held prior to termination in 1954.

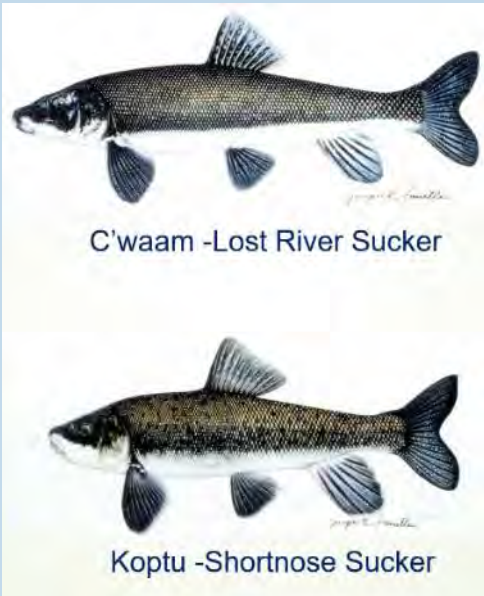


Present day Lower Klamath and Tule Lakes cover a fraction of their historical spread. | Source: Klamath Tribes

State and federal inaction on agricultural and industrial practices threatens Tribal welfare and regional ecology

Tribal leadership considers the time for compromise to have passed. The youngest generation of suckerfish that successfully reproduced in the wild were born in the 1990s and are nearing the end of their lives. The Tribe estimates suckerfish will become functionally extinct in the wild in about 10 years. A lake that once supported tens of thousands of pelicans now only has a few hundred nesting pairs. Downstream on the Klamath River, fish kills from algae blooms are also killing off salmon, a fish of critical importance to the Yurok and Karuk Tribes. Lower Klamath Lake and Tule Lake are also struggling. According to Klamath Tribal leadership, “...the remnants are reduced to what USFS calls “sumps,” basically puddles that struggle to receive water. Large disease outbreaks have occurred among migratory birds as a result of low water.”

According to Tribal staff, Upper Klamath Lake is “like a tapestry. You can see that it was once richly threaded, but it is now threadbare.” The Tribe works closely with state agencies like the Department of Environmental Quality, the Oregon Department of Agriculture, and the Water Resources Department, and has lobbied to increase staffing for enforcement in the region. They want agencies to regulate more effectively, but for them to do so, certain state policies need to be addressed and agencies must be properly staffed.



The two species of suckerfish endemic to Klamath Lake are now endangered. | Source: Klamath Tribe

The Tribe wants more representation from the state agencies in the region. With current staffing levels and policies that hamper effective regulation, the agencies are unable to proactively address water use issues or ecological concerns.

Policies that concern the Tribe include the Department of Agriculture’s 10-step compliance process, which is triggered primarily by complaints and can reportedly take years to deliver fines to water abusers. The Tribe considers rules around cattle grazing to be ineffective, nonsensical, and almost unenforceable. For example, it is legal for cows to enter or be near a river, but it is illegal for cows to “impact riparian areas or poop in the water.” As of 2022, only 5% to 10% of the riparian areas in the upper Klamath Basin were healthy. The rest have been impacted by free-range cattle and other agricultural practices.

The Tribe is cautiously optimistic about recent federal investments into ecological restoration in the region but has substantial concerns about ongoing agricultural practices and state policies that do not sufficiently protect against rampant environmental degradation. This issue, combined with the impacts of climate change and the ongoing drought, has put substantial pressure on all the water users in the region. Tension is high.

Tribal representatives told the Audits Division it has put them at odds with many of their neighbors and even other Tribes downstream as they petition to retain enough water in the lake every summer to keep the water cool enough for the suckerfish to survive. Unfortunately, that means there may not be sufficient water downstream to meet agricultural needs or ensure that the Klamath River has enough water in it for salmon.

According to the Tribe, one of the most effective things that can be done to restore the ecosystem right now is simply to stop doing it active harm. “Just let the willow trees grow on the banks... Let nature restore itself. Stop getting in the way.” Yet that will require the Tribe have a more direct hand in land and water management across the basin, with ongoing state, federal, and local coordination. For the local ecosystem and the Tribe to endure and thrive, the state must do more to ensure the kinds of industrial and agricultural practices used in the basin are ecologically appropriate and may need to reconsider water use in the region entirely.

The Klamath Tribes continues to buy land and have made it clear that their end goal is the full restoration of their traditional lands to Tribal ownership and stewardship.

What Has Oregon Done in the Past to Address Issues of Water Governance?

Oregon has struggled for decades to establish a robust water governance structure to help meet the state's needs. The state continues to face challenges defining and improving its role in water governance and in updating and enforcing water policies that protect water quantity, quality, and ecosystems.

The introduction of Oregon's Water Code in 1909 was borne out of a need to manage the resource for the new state

Prior to the settling of the western United States, states in the eastern half of the country loosely followed the Riparian Doctrine, which was based off English Common Law and dictates the right to water belongs to whomever owns the property where the water is located. In the arid western states, prior appropriation was developed to address difficulties with water access. Prior appropriation as we know it today is considered to have originated following the California Gold Rush, where water was diverted out of streams and rivers for mining operations and rights were tied to the point of diversion.

In the 1800s, Congress invested heavily in infrastructure, including constructing dams, with the intention of developing the West's water resources to meet the agricultural and industrial needs of the growing nation. This new approach to water management in the West was not without controversy. John Wesley Powell, who headed the U.S. Geological Survey, opposed the direction the United States was taking around water management and water development. He did not believe that the lands of the West were suitable for agriculture and instead offered a vision centered on organizing small settlements built around watersheds, which would encourage collaboration and conservation.

Regardless, large water projects diverting rivers and draining lakes to irrigate crop fields were funded on a massive scale across the West. A series of federal laws were passed starting in the 1860s addressing natural resource use (particularly around mining). However, these laws provided little guidance on the allocation of



Onlookers stand above a hydraulic gold mining operation in the late 1800s.
| Source: Oregon Blue Book, Courtesy of Oregon Historical Society

scarce water resources. In the decades following, policies around water allocation became the purview of individual Western states as they experienced rapid transformation under settlement.

“I tell you gentlemen you are piling up a heritage of conflict and litigation over water rights, for there is not enough water to supply the land.”

- John Wesley Powell, 1893

After lobbying from business and agricultural interests, Oregon followed the example of other western states to introduce its own water code in 1909. The new law declared water a public resource held in trust by the state and required a permit for its use, which must be determined to be beneficial and used without waste. It also introduced a court-based process for settling water right disputes on claims predating the introduction of the Water Code. Oregon’s Water Code was an effort to create order where “...no foundation existed for titles to water. Utter confusion prevailed as to the legal status of a water right.”¹¹

While the Water Code created order, it was not designed to equitably allocate water resources to meet a balance of needs, particularly in the long term. Prior appropriation’s origins in the mining camps of California held an economic view of water as an inert and isolated resource to be moved and used as needed, and not as a dynamic and integrated resource necessary to the health and functioning of entire ecosystems.

Since 1909, some updates to the Water Code have attempted to assert a greater balance of interests, such as the introduction of instream rights, or rights designed to hold water in the stream to protect local ecosystems, in 1987. There have also been efforts to better integrate the various state agencies whose roles and responsibilities affect water usage. These efforts have met with limited success.

Since the 1950s, Oregon has several times attempted to overhaul statewide water planning and management, but never developed a comprehensive plan

Legislation passed in 1955 **established the state’s basin programs**, though they remained uncoordinated and limited in scope

Oregon sought to create an integrated water policy as early as 1955, when the Oregon Legislature passed House Bill 25 to establish a new state agency, the State Water Resources Board, a predecessor to the current State Water Resources Commission.¹² The board had broad authority to establish a coordinated, integrated water resources policy and the plans needed to promote the maximum beneficial use and control of water resources.

To achieve this, the state developed basin programs for most of the state’s 18 river basins overseen by the Board, and now the Commission. The programs consist of state administrative rules classifying available water for future allowable uses (municipal, agricultural, and wildlife) and regulations specific to

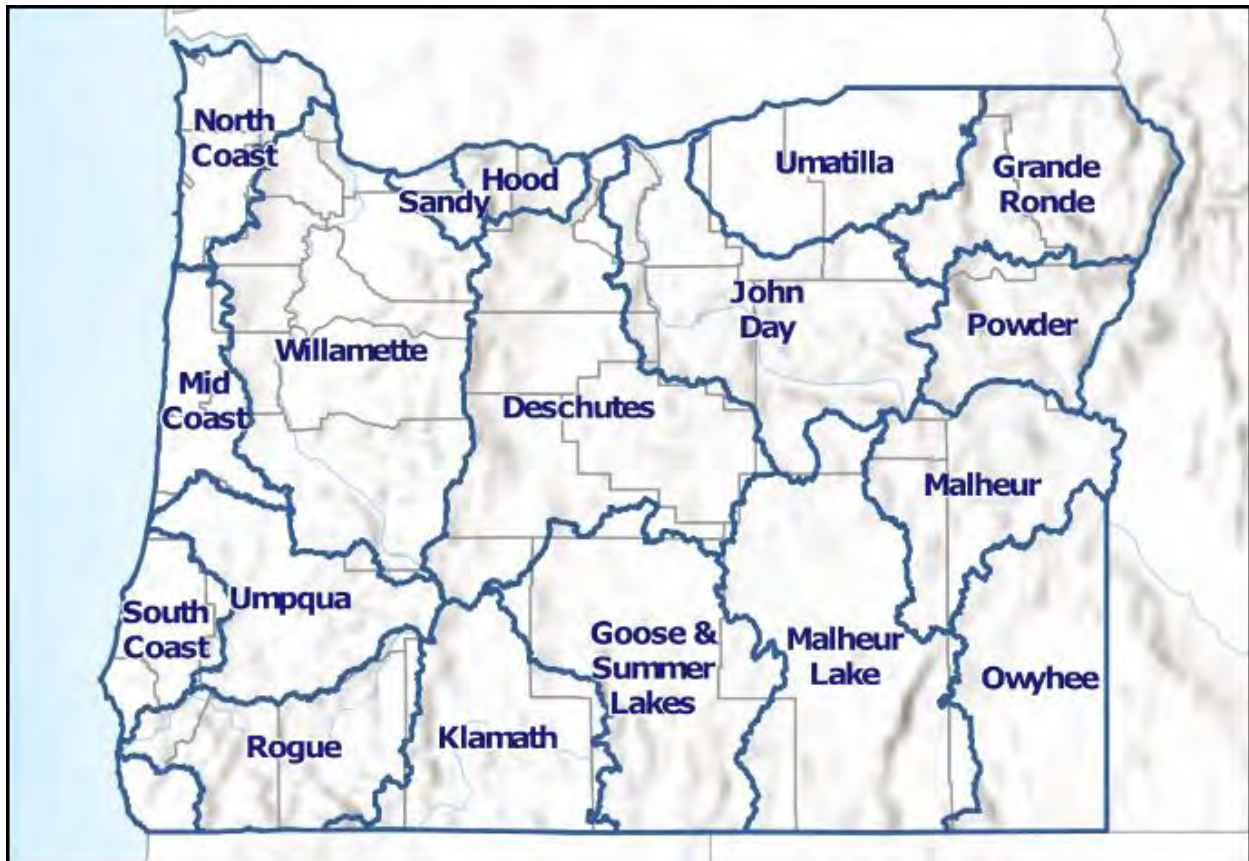
¹¹ The Oregon Water Handbook. Rick Bastasch. 2006. Pg 54.

¹² The Water Resources Commission oversees and establishes the policies for the Water Resources Department, which is charged with administering the laws governing the management and distribution of surface and groundwater resources.

each basin, such as minimum stream flows. These largely state directed regulatory programs were adopted by the board starting in 1959. By 1970, the state had established programs, which focus on water classification, for 15 of the state's 18 administrative basins. Program development and updates occurred intermittently into the early 1990s.

The state intentionally took a basin-by-basin approach to accommodate each basin's varying water needs and localities and did not develop an overarching strategy to help guide or support basin efforts. Most water-related management decisions were still made by individual agencies and local governments in a largely uncoordinated way.

Figure 4: Most of WRD's 18 administrative water basins have a basin program



Source: WRD

Oregon expanded state-directed basin planning to consider more holistic aspects of water management, but abandoned the effort

Amid concerns about Oregon's fragmented approach to water management and long-term sustainability, the Legislature in 1983 passed bills in an attempt to establish a state-led, strategic, and coordinated interagency approach to water planning.

A bill created the Strategic Water Planning Group,¹³ consisting of the Governor's Office and representatives from nine natural resource agencies. The interagency group was tasked with

¹³ Senate Bill 523 passed in 1983. Senate Bill 605, passed in 1985, called for continuing interagency coordination of water planning and management in creating the Strategic Water Management Group of a similar makeup. However, unlike 523, Senate Bill 605 did not require the new group to develop a Multiagency Water Management Plan tied to expanded basin planning.

developing a multi-faceted water management plan for river basin management to address multi-agency concerns and improve water resource conditions. The law outlined requirements for a coordinated and expanded planning process for water basins, which would integrate different aspects of water management, including surface and groundwater, and water quantity and quality. Participating agencies were also required to coordinate on budget development and develop a shared data system.

To test the new process, the state undertook extended planning for the John Day Basin Program;¹⁴ the Water Resources Commission adopted the resulting plan in 1987. However, per a 2013 memo to the commission from Water Resource Department policy coordinators, the effort was “criticized as being overly expensive and failing to produce an interagency agreement on water resources management.”



Bonneville Dam, 1941. | Source: Library of Congress, Prints & Photographs Division, Farm Security Administration/Office of War Information Black-and-White Negatives.

By the early 1990s, the Legislature had largely moved away from basin planning. Key stakeholders told auditors the process was considered too “top down” by some, and “planning” came to be known as a bad word in Oregon. Overseen by the Water Resources Commission, the programs remained a largely regulatory function. In the early 90’s, the WRD section responsible for basin program updates and

¹⁴ The John Day Basin program is one of WRD’s administrative basins within Oregon’s North Central regional river basin management area. The most recent study report for the basin was published in 1986 and can be found with the basin’s program here: <https://www.oregon.gov/owrd/programs/administrativebasins/Pages/default.aspx#b6>

water policy and planning was dissolved. The state had little capacity to continue to update basin programs even for regulatory purposes.

Since then, the state has gone without comprehensive water supply planning. During much of this time, WRD has not supported basin planning in a coordinated or systematic way, and instead provided support on a case-by-case basis to locally initiated planning efforts. Most basin programs have not been updated since the 1980s. According to WRD, resource constraints, such as reductions in state and federal funding, are a key limiting factor. The programs remain an important water allocation tool and are still considered by WRD during the permit process but have been limited in their ability to protect the state's water resources.

Oregon shifted focus **in the 90's** to a locally driven, collaborative governance approach to watershed restoration

Oregon watershed legislation and shifts in watershed management during the 80's and 90's reflected the state's evolving approach to water governance. Rather than taking a directive approach, the state emphasized voluntary, locally initiated actions guided by the state at a distance through grants. In response to growing concerns about federal listings of threatened and endangered fish species, major statewide reform initiatives focused on environmental species protections and watershed restoration. Other aspects of water management remained largely unchanged during this period.

In 1995, the state began developing what came to be known as the Oregon Plan for Salmon and Watersheds, a new effort to unify the state around a central water-related plan. The plan started as a state-led strategy and proposal for the federal government to avoid listing salmonid species under the Endangered Species Act. Eventually, the plan broadened to encompass additional watershed management issues.

The innovative plan¹⁵ took a holistic approach to protecting ecosystem health and water quality and considered other factors, such as land management practices. In addition to promoting multi-state agency coordination, the plan emphasized the need for locally driven watershed initiatives. Per the Oregon Department of Fish and Wildlife: "The most important part of the plan is the idea that people working together, with the support of state and local government, can do more to help fish than can be accomplished by a strict regulatory approach." The plan leveraged the state's grant-making for local voluntary watershed councils that began to form in the 1980s with grassroots efforts as its key mechanism for salmon recovery and river restoration. Soil and Water Conservation Districts were also funded to focus on agricultural nonpoint source pollution and implement the Oregon Plan on agricultural lands.



¹⁵ The plan was considered a finalist for the Innovation in American Government awards by the [Harvard Kennedy School Ash Center for Democratic Governance and Innovation](#).

In 1999, the Legislature formed a lasting institutional structure to help support plan implementation by creating the Oregon Watershed Enhancement Board (OWEB), using significant dedicated funding to grants from a ballot measure passed by voters the prior year.¹⁶ The measure, extended in 2010, allocated a portion of state lottery dollars for watershed restoration grants, which remain the bulk of on-the-ground funding and an essential funding source for the board’s staffing and grantmaking. The board includes voting members from the public, Tribes, and state agencies, in addition to non-voting, advisory federal agency and state university members. Responsibility for plan implementation also falls to multiple state agencies connected to fish, wildlife, and water quality, working with local partners, with related agency programming supported by state lottery dollars.

While OWEB continues to support important statewide natural resources efforts through its grantmaking, neither the agency’s programming nor the Oregon Plan for Salmon and Watersheds were ever intended to ensure all water needs are met for current and future generations. In practice, the state relies heavily on local partners for on-the-ground watershed restoration work, and local partner capacity is a limiting factor in the pace of restoration that can occur. In addition, as a competitive grant program with limited funds, not all communities applying for funding to address water and ecosystem needs receive funding, and only those adequately resourced and organized can apply. Of the communities that can apply, staff told auditors only half receive funding. State lottery funding supporting agency work on plan implementation is also limited.

Oregon has not maintained a comprehensive water policy and management approach partly due to fluctuating priorities from changes in elected leadership

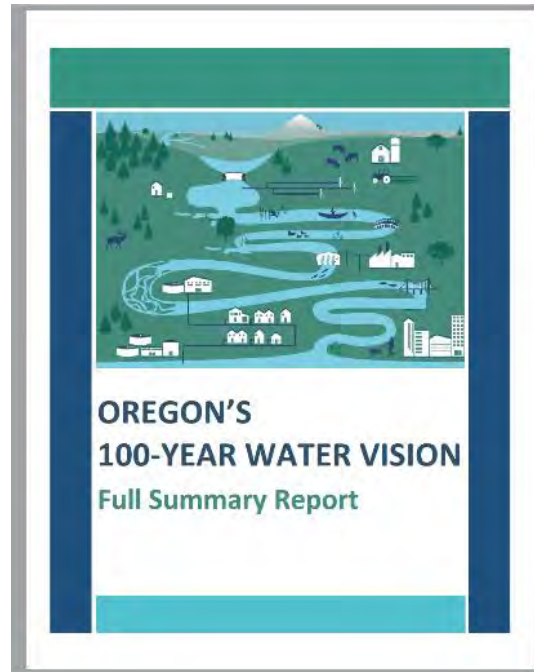
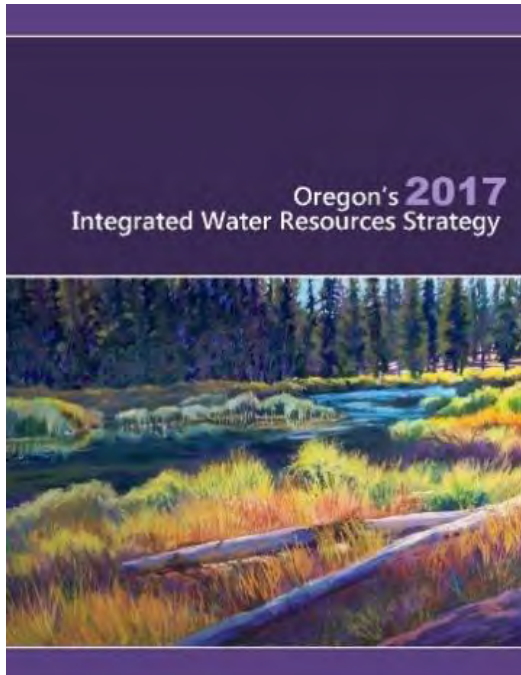
A pattern has emerged over the decades: with changes in gubernatorial, legislative, and agency leadership, the state has pursued different initiatives to coordinate state participation and support more holistic and strategic water management. However, as leadership changes have occurred alongside other social and environmental pressures, each of these reform attempts has eventually lost momentum, deviated from earlier reforms, or failed to sustain attention, commitment, and a vision for water planning or priority setting.

Governor Vic Atiyeh spearheaded expanded basin planning in the 1980s, but the legislation adopted at the time never led to coordinated and strategic water planning. The state group leading the effort was ultimately dissolved by the legislature. Governor John Kitzhaber deviated completely from basin planning to take an instrumental role in establishing the Oregon Plan for Salmon and Watersheds, garnering considerable legislative and financial support for its implementation at the time — it, too, eventually lost leadership’s focus. Neither effort has led to a comprehensive water strategy.

The **Strategic Water Management** group, made up of representatives from the Governor’s Office and 13 state agencies, was a centralized coordinating body aiming to ensure agency functions were complementary and not conflicting. The group was active from 1985 to 1995 and dismantled during the state’s push to adopt more locally driven water management. Some of this entity’s functions are now carried out informally by the Water Core Team and Natural Resources Director’s Cabinet.

¹⁶ Ballot Measure 66 passed by Oregon voters in 1998 amended the Oregon Constitution to dedicate a portion of lottery proceeds to finance the restoration and protection of native salmon populations, watersheds, fish and wildlife habitats and water quality. Measure 76, passed by voters in 2010, extended and modified the provisions.

Critical reports in the early 2000s noted the ongoing need for strategic improvements in addressing the state’s water challenges. In a 2000 State of the Environment report, several Governors recognized that too often state decisions about how to manage the environment have been characterized by polarizing debates and a lack of scientific information. In a 2003 report, the Joint Legislative Task Force on Water Supply and Conservation recommended the state develop a long-term water supply management plan. The report noted “despite basin planning efforts dating back to the mid-1950s, the state does not have a comprehensive plan to ensure it can meet the water needs of streamflow dependent resources and a growing economy and population.”¹⁷



In 2009, when Oregon was reportedly one of two states in the nation without a statewide water plan, the Legislature passed the Integrated Water Resources Strategy (IWRS) to address maintaining healthy water resources to meet Oregon’s current and future water needs. The legislation specified the strategy should implement the coordinated, integrated water resources policy codified in statute in 1955. An advisory group met and several state agencies and key stakeholders were involved in development. The strategy also took a holistic approach to incorporate water quantity, quality, and ecosystems, as well as all uses of water into the document. The state updated the IWRS in 2017, with another policy advisory workgroup, and both plans resulted in legislative investments.

Just one year later, however, this effort was sidelined by a separate initiative from Governor Kate Brown. The new initiative led to a high-level strategy document, “100 Year Water Vision: A Call to Action,” published in 2020. While the vision helped draw attention to water challenges and was intended to elevate aspects of the IWRS, it was not aligned with it. As detailed later in this report both plans and efforts have had mixed results.

These well-intended, but fractured, efforts have left the state unable to fulfill the intentions set out by leadership for improving water management, and, along with other factors, have seriously impeded the

¹⁷ Final recommendations to the 72nd Legislative Assembly. Oregon Joint Task Force on Water Supply and Conservation. June 2003. See page 21. <https://digital.osl.state.or.us/islandora/object/osl%3A989212>

state's ability to plan for and promote water security for all Oregonians. This has so far been particularly impactful for vulnerable communities susceptible to drinking water safety and affordability challenges; meanwhile, water security risks such as climate change continue to add pressure.

Oregon's most recent initiatives hold promise, but there is much more work to do

Since the 2020 release of the Water Vision report, the state continues to engage in the following significant statewide water planning and management efforts:

- In 2021, the Legislature and Governor Brown passed a \$538 million water package, making an unprecedented investment in Oregon's water resources. The package included investments in a range of water initiatives, with most funding directed toward infrastructure improvements and regional- and basin-specific projects.
- The Department of Environmental Quality was charged with scoping a data portal project to improve water data accessibility and identify gaps in statewide water data.
- House Bill 5006, passed in 2021, directed WRD and the Oregon Consensus, a Portland State University mediation and facilitation program, to convene a workgroup to reconsider the state's approach to water planning and management.

As Oregon proceeds into the 21st century, it has yet to find a coordinated approach to water challenges. What the state does have is 100 years of history to learn from:

- Leaving out key stakeholders and Tribes— including vulnerable communities who have suffered from inequitable treatment by the state and federal and local entities — from policy decisions can harm those communities.
- Water planning cannot be entirely localized because it leads to fragmentation and a lack of coordination among individual communities. Some broader public interests are not considered, and some key players are left out.
- It also cannot be driven entirely by the state; too much “top-down” direction can cause resentment among local stakeholders and does not adequately account for varying needs across different communities.
- Changes in state leadership have made it difficult for a sustained focus on a shared set of priorities for water security and equity.

A coordinated effort by the state will require the involvement of multiple entities. This includes local communities and governments, as well as those who have suffered from inequitable treatment in the past; the federal government; Oregon Tribes; numerous state agencies with responsibilities of varying degrees tied to water use; adjacent states; and state leadership, primarily the Governor and the Legislature, among others.

These numerous stakeholders will have to strike a balance to be successful in planning for water management. On the one hand, the planning process must respect individual and varying needs across different communities, or regions; on the other, it should also include a holistic, statewide vision that accounts for long-term sustainability of our water resources and their equitable use. In other words, a state and regional water planning framework.

What Does Oregon Need to Do Now?

Timely and decisive action is needed to address deficiencies in **Oregon's water governance and** improve water security and equity

Because the landscape of water resources and accompanying need varies so widely from state to state, there is not a generally accepted framework or model for Oregon to adopt. While Oregon can learn from strategies adopted by other states it needs to develop a governance approach based on Oregon's unique needs and risks. To help guide this effort, state leadership should follow the principles of good water governance, which will help ensure the best chance of long-term success.

Oregon has already taken some important steps to set up a state-supported regional framework, but more work needs to be done to ensure this effort meets the needs of communities across the state. Underlying all of this is a particular urgency: many communities are already struggling with water security and inequity, but as climate change advances, water insecurity may ultimately threaten the environmental and economic well-being of the entire state, even rendering some regions economically unviable and difficult to inhabit.

Applying principles of good water governance through a well-structured and supported state and regional planning framework will help ensure equitable water security for Oregonians

Developing a state and regional water planning framework can help align Oregon with leading practices and create an avenue for more community involvement in key decisions around water management. Stakeholders at all levels should be involved in local water security solutions. Leading water management practices emphasize policies should be based on long-term management plans rooted in the appropriate scale, such as at a basin level. Yet without a sound framework and strong support, under-resourced communities may face barriers to involvement in locally initiated planning and state-level water policy decisions.

There is no singular framework or model used in other states or countries that will fit Oregon's unique needs and risks. Leading practices recommend tailoring water management approaches to local environments and circumstances. What works well in one state or region may not be effective elsewhere, depending on the region's water profile, what local industries are in place, and how water policy is set up to guide water management.

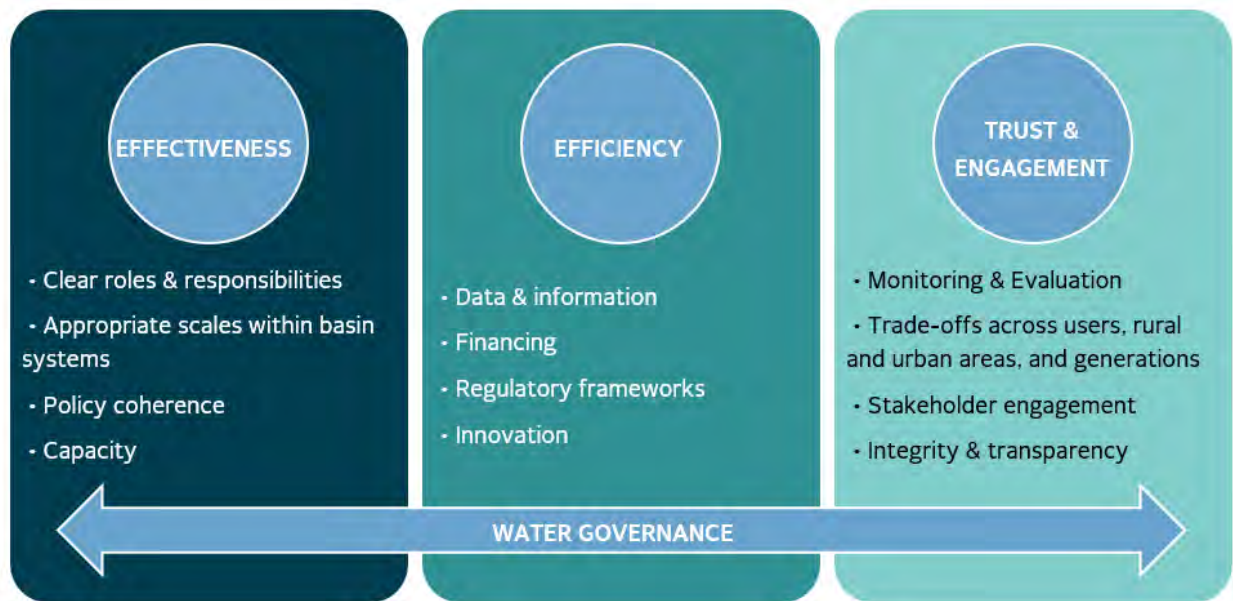
While no single best practice model exists, Oregon can possibly look to specific elements of other state's approaches to inform the development of our own model. For example, some other states have taken a "formal approach to locally-led planning, with direction and financial investments coming mainly through state resources."¹⁸ Colorado and Texas have set up regional structures that allow for planning to encompass the entire state and prioritize needs across basins. These regional plans roll up and inform a state-level plan, and both states also have dedicated funding mechanisms for supporting plan implementation.

¹⁸ 2012 Integrated Water Resources Strategy.

If well-developed and thoughtfully structured around the principles of good water governance, frameworks for regional and state water planning can support legitimacy in decision-making at both the state and local levels and provide effective communication conduits to promote compromise and pragmatism. These frameworks can also provide pathways for communities to address water challenges and access state support and funding, as well as support public engagement and balancing interests at the local level to develop action-oriented implementation plans. A robust framework can support equity, water security, making timely progress, and accountability in engaging groups of individuals to work together toward defined, shared outcomes and deliverables.

Regardless of the exact structure developed, a state and regional planning framework must be prioritized by the Governor’s Office and Legislature and adhere to principles of good governance to better meet the state’s long term water needs. Integrated water resource management is generally accepted as a best practice in the water arena. According to the international Organisation for Economic Cooperation and Development¹⁹ (OECD), while this approach is a best practice, it has brought uneven results in different countries. It requires an operationalization framework that consistently and sustainably considers short-, medium-, and long-term needs.

Figure 5: The Organization for Economic Cooperation and Development captures the main principles of water governance



Source: OECD

The following principles were developed by OECD for governments seeking to strengthen their water governance and are centered on three main dimensions:

- Effectiveness, defining and implementing clear and sustainable water policy goals;
- Efficiency, maximizing the benefits of sustainable water management at the least cost; and
- Trust and engagement, building public trust and inclusivity of stakeholders.

¹⁹ The Organisation for Economic Cooperation and Development is an intergovernmental organization with 38 member countries with a goal of stimulating economic progress and world trade through policy development and the development of international standards.

These principles are rooted in broader principles of good governance: legitimacy, transparency, accountability, human rights, rule of law, and inclusiveness.

Oregon has started to develop pieces of a state-supported regional planning framework, but critical aspects of good water governance still need attention

The state attempted to build an integrated planning framework in 2012, with the first IWRS and it recommended place-based planning as a way to support the strategy's implementation at the local level. The IWRS sought to help the state adopt a broader and more holistic, integrated, and long-term plan for water resources. However, Oregon's current fragmented agency structure undermines the potential for the strategy's implementation, and place-based planning, which has not yet been fully established, was found to require additional state support.

“Oregon’s once-progressive system of public ownership and management of waters too often operates, not in support of the public’s interests, but in isolation from them.”

- The Oregon Water Handbook, 2006. Rick Bastach.

In 2021, with the passage of House Bill 5006, the Oregon Legislature recognized the need for “a framework and path for state-supported water planning and management at the water region and/or basin level.” This framework could support setting up the structure needed to sustain the state's focus on carrying out integrated water plans and help guide state water strategy, investment, and policy decisions. The framework's specific attributes and how it intersects with the state will be critical to ensuring it helps meet Oregon's water needs.

The bill tasked WRD with coordinating with Portland State University's Oregon Consensus²⁰ to convene a workgroup of water stakeholders to develop the framework. Since January 2022, members have been working in monthly meetings to understand and accomplish their difficult charge. The workgroup was intended to have balanced interests, which meant assembling a group with specific and, at times, conflicting priorities for water. In response to some initial confusion about their broad and vague assignment, in September 2022 legislators and agency leadership overseeing the effort refined the project scope to address whether place-based planning should be continued. The WRD Director clarified this could involve redefining the future of place-based planning and the group's recommendations could address specific program needs or broader system-level issues.

The group engaged in collaborative discussions to develop draft recommendations. With members representing various interests, the effort appears to also support building the political clout necessary to back their eventual proposal. Legislators overseeing the effort expected final workgroup recommendations for the 2023 legislative session.

Place-based planning has only been tested as a pilot program scheduled to sunset in the spring of 2023. The state is in the process of defining a path forward for the program, with WRD submitting a legislative concept for its continuance.

²⁰ Oregon Consensus is part of Portland State University's National Policy Consensus Center. They provide expert mediation and facilitation services for government and non-government entities to address public policy issues.

Place-based planning is a flexible, voluntary approach to engaging communities in water management strategies and solutions. As an integrated approach to water management, it has been popular among many water stakeholders in Oregon. The approach extends beyond water regulation to allow for innovative actions proposed from the bottom up. Oregon's four pilot projects were supported by WRD grants and technical assistance.

The place-based planning pilot has also revealed risks. Without elements of a necessary structure and adequate state guidance and support, there is a risk this planning will be inequitable and ineffective. Statute does not address whether or how place-based planning is going to inform IWRS development. How local plans should inform state-level water strategy or be implemented remains unclear. As locally initiated efforts, the approach cannot easily address all communities in need across the state. The pilot projects demonstrated a need for substantial resources and the state has dedicated limited capacity to planning. These hurdles and data deficiencies, often requiring assistance from the state in addressing, interfered with plan development.



WRD hosted community meeting. | Source: WRD

An evaluation of the pilot also identified the necessity to clarify the state's role in supporting planning efforts and implementation. The workgroup addressed many of those questions and worked to develop recommendations for a state-supported regional planning framework.

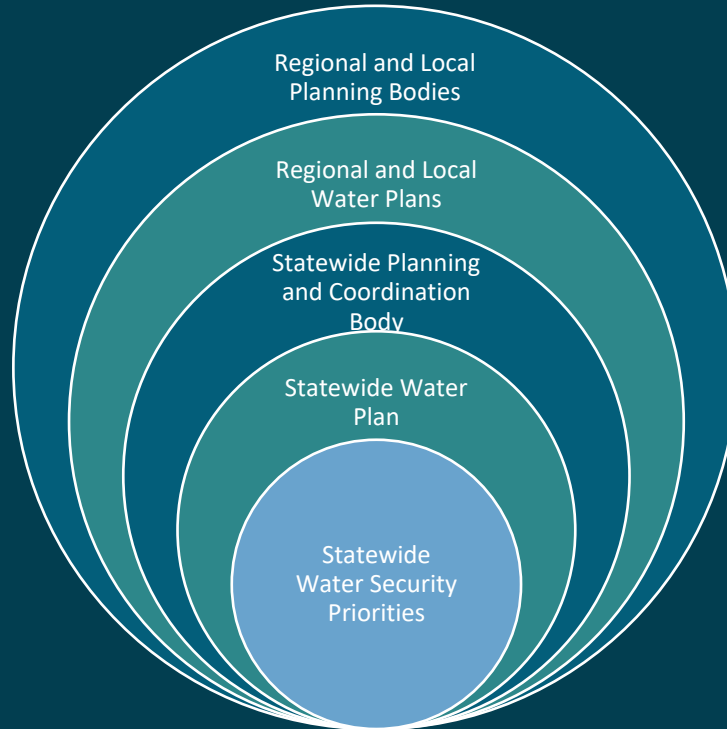
The workgroup's final report was sent to key legislators, the outgoing Governor's Office, and key agencies in December 2022. The report's recommendations focus on increasing agency capacity to support planning, and on improving and expanding the next generation of place-based planning projects. Most of the recommendations are specific to place-based planning and revolve around establishing a process for state recognition of place-based plans, enhancing agency capacity and support for planning, setting up a grant program, developing more robust program guidelines, and sustaining funding.

The regional workgroup’s recommendations will expand upon previous place-based planning efforts but may not go far enough in developing a robust regional framework and water governance model that supports a wide spectrum of water needs. State involvement in the group was confined to three state agencies acting as support staff, three legislators, and the Governor’s Office. The recommendations do not address the need for policy reform to enhance water security for Oregon communities and place substantial responsibilities on a handful of state agencies. However, it was not the workgroup’s charge or intent to comprehensively address the state’s water governance gaps.

While focused mainly on place-based planning, the workgroup’s recommendations are helpful to enhancing and building upon the state’s existing approach to regional planning and are largely in line with the recommendations in this report. Community and stakeholder participants in the workgroup also showed an overall high level of support for the final recommendations. How the state moves forward on them will be critical to the success of any water planning approach the regions or state pursue.

What could an Oregon water framework look like?

The framework should be centered on shared priorities of water security and support statewide and regional planning and a broad spectrum of associated water governance needs. These needs include data, funding, Tribal and community engagement, interagency and multi-level coordination, and policy development. The framework could be supported by a central planning and coordination body that works with entities involved in local and regional planning.



Note: This diagram is meant to serve as a hypothetical example of what a framework could look like in Oregon; it is not a recommendation by the Audits Division.

A statewide planning and coordination body and regional and local planning bodies could include state, federal, and local agencies, legislators, community representatives, Tribes, and key water stakeholders.

A statewide planning and coordination body could potentially perform the following actions:

- Work closely with regional and local planning bodies, state agencies, Governor's Office and Legislature, and Tribes
- Develop statewide water security priorities with regional input
- Develop state water plan with regional input to inform and guide regional planning and implementation
- Make statewide policy recommendations

Regional and local planning bodies could potentially perform the following actions:

- Work with statewide planning and coordination body, local communities, Tribes, key stakeholders, and agency representatives
- Develop local and regional water plans, guide implementation
- Ensure state water security priorities reflected in regional and local plans
- Make regional policy recommendations

Many important aspects of water governance need to be considered when developing a state framework

The Audits Division identified multiple areas in Oregon’s water governance that need attention to better protect water security and enhance water equity. To ensure Oregon can equitably serve all the water users of the state, the development of a state water governance model will need to include the following components, which reflect the core principles of good governance outlined by the OECD around effectiveness, efficiency, and trust and engagement:

- Priorities centered on water security and equity shared by state leadership and agencies that can guide water decisions
- An actionable and equitable state-level water plan based on shared priorities connected to local and regional planning efforts
- A formal planning and coordination body to enhance statewide water governance
- Clearly established agency roles and responsibilities within a state and regional framework to ensure there is no operational overlap or gaps in service
- A balance of interests and means to address high priority needs by integrating more communities and diverse voices into water management decisions
- Broader public awareness of the state’s water challenges
- State water policy prioritizing the human right to water and more exploration of policy options that could better protect community and ecosystem health
- Data that can support strategic decision-making within a regional framework
- A strategic approach to funding supporting statewide planning and implementation and adequate and stable funding for key water agencies
- Clear leadership support for state water agencies tasked with carrying out critical regulatory duties.
- The full integration of Oregon’s Tribes as equal partners into state and regional water decision-making.

Tribal integration into water decisions will be an especially critical component of a state and regional framework. Oregon Tribes the audit team spoke with apply a holistic view of water and other natural resources to their programs and work. Tribal land and water management practices tend to align with leading practices and are culturally significant and ecologically appropriate for their homelands. Furthermore, integrating Oregon’s Tribes into water decision-making can help the state take important steps to address past harms and ongoing practices that disadvantage the land’s original inhabitants.

The framework should apply broadly to water quantity, water quality, and ecosystem needs. It should build on the state’s recent efforts around the Integrated Water Resources Strategy, the 100-Year Water Vision, the 2021 Water Package, and the ongoing efforts of individual state agencies, local jurisdictions and federal agencies, communities, Tribes, and key stakeholders, among others.

In developing the framework, there must be significant consideration of the complex layers of state, federal, and local water policies and practices. State leadership will need to ensure that there is feedback and representation present from critical groups when making decisions that impact that state or a specific region.

Comparison of statewide water strategy development initiatives (2009-present)

IWRS	Similarities	100-Year Water Vision
<p>Established by the Legislature in 2009 and remains in statute.</p> <p>Developed primarily by WRD in coordination with other state agencies and a public advisory committee.</p> <p>Intended to be an integrated strategy to meet Oregon’s water needs.</p> <p>Statute requires IWRS be updated every five years.</p> <p>The 2017 IWRS update details many of the water challenges facing the state and lists 51 high-level recommended actions with more detailed suggestions for implementation.</p> <p>The next version is slated to be released in 2023.</p> <p>Statute requires the IWRS be designed to meet Oregon’s water needs. Both versions recognized this will require understanding those needs and proposed initial steps for doing so. For example, under the general goal: “Understand Water Resources Today,” both versions have included the recommended action: “Improve water resource data collection and monitoring.”</p>	<p>Developed primarily by one state entity with some public involvement.</p> <p>High-level strategy documents.</p> <p>Detail many of the water challenges facing the state and suggested recommendations for future water efforts.</p> <p>Responsibility is now primarily on WRD.</p> <p>Advocate for obtaining foundational water information and developing additional governance structures to help meet Oregon’s water needs.</p>	<p>Initiated by the Governor’s Office in 2018; never in statute.</p> <p>First phase led by the director of the Oregon Watershed Enhancement Board and included an extensive public engagement process.</p> <p>Intended to help guide Oregon into the future on planning for and investing in water infrastructure, to draw legislative investments, and elevate aspects of the IWRS.</p> <p>A stand-alone statewide water planning and management development process, in two phases.</p> <p>Phase I, published in 2020, details many of the water challenges facing the state, articulates a vision and goals for improving the state’s water security, and identified objectives for phase II.</p> <p>Phase II included several legislative investments and initiatives related to the objectives. Responsibility for its implementation shifted from OWEB to WRD.</p> <p>The Governor intended for Phase II to help establish a state and regional structure for how water investments should be strategically coordinated and prioritized. This would involve developing recommendations for the framework and changing how the state approaches different aspects of water management in the areas of community capacity, water funding, data, and public engagement.</p>

Developing shared priorities among state leadership and agencies on water security and equity will help guide Oregon in making holistic and inclusive water decisions

State leadership focus on water since 2000 has been intermittent. In 2009, the Legislature spearheaded the creation of the IWRS, released in 2012. The Legislature also reintroduced the House Water Committee in 2018-19, and in 2020 the Governor’s Office released the 100-Year Water Vision.²¹

²¹ See Appendices F and G for 2017 Integrated Water Resource Strategy Recommended Actions and the Updated 100-Year Water Vision Goals and Objectives.

Several water bills have been introduced that have shifted more federal funding toward badly needed water projects.

However, both the IWRS and 100-Year Water Vision have not received the kind of sustained support needed to fully develop and implement achievable goals. Both efforts provided benefits at the time of their release, such as standing up a place-based planning pilot and the passage of the 2021 Water Package. In terms of high-level strategy, the two efforts appear duplicative — while state leadership reported the 100-Year Water Vision was needed as an implementation mechanism for aspects of the IWRS, the Water Vision repeated much of the IWRS effort.

Both efforts were developed under different Governors and have some differences but also share similarities. For example, both efforts resulted in a high-level strategy document focused on characterizing current water issues and on developing methods for moving Oregon forward on addressing water management challenges but neither effort has led to actionable water plans.

Prior to the creation of the IWRS, Oregon was noted as lacking a “future focus” when it came to water, and the system was referred to as “the eight-track tape... of natural resource management schemes.”²² While some attention has gone to remedying the state’s lack of a long-term water view, the system remains largely the same as it has been for decades, despite the need for greater leadership, more enhanced coordination, and an evolving policy approach.

Oregon needs to build on its efforts around the IWRS and Water Vision to develop shared and agreed upon statewide water security priorities. These priorities can inform the development of a state plan tied to a regional planning framework and improve policy coherence and transparency of agency functions. Having core priorities in place can also help Oregon’s water agencies align their missions and programming and guide their efforts to prioritize water security concerns, as well as reducing the risk they could duplicate efforts. Furthermore, setting up a formal planning and coordination body can support the implementation of these shared priorities. This kind of sustained commitment to water security on the part of state leadership is necessary to make headway with positive and lasting impacts at both the state and local level.

[An actionable and equitable state water plan, connected to a regional planning system, can help guide water decisions and policy development](#)

Regional planning connected to an actionable state water plan could better support state water priority setting, sustaining legislative focus on shared desired outcomes, and help ensure adequate and balanced public engagement in the process. Should the state choose to use the existing IWRS as a planning base, it would likely require modifying the IWRS and the organizational structure supporting plan updates and implementation. This effort would also need to be adequately staffed and resourced, which has been an ongoing challenge for key water agencies.

²² The Oregon Water Handbook. 2006. Author Rick Bastasch was a WRD Division Administrator overseeing the agency’s Strategic Planning and Policy Coordination Division in the early 1990s. He is also the former Executive Director of the Willamette Restoration Initiative and Rivers Office Coordinator for the City of Portland.

Many stakeholders value the IWRS; however, limitations with the substance of the document, the public engagement process for its development, and a lack of implementation pathways and appropriate resources impede the strategy's usefulness.

Most of the 13 agencies asked about the strategy found it helpful, with some commending its framing of water issues. While several agencies said they refer to the IWRS as a helpful strategic decision-making guide, only two agencies have tied it to a strategic plan. Agencies recognized challenges with the substance of the document itself for implementation. Specifically, its 51 recommended actions are not prioritized, sufficient metrics or milestones are not included to track progress at meeting goals, and it lacks ties to local priorities and needs. These limitations can interfere with its use as an actionable document to support state and local water decision-making.

Concerns have also been raised about the state's lack of full engagement with Oregon communities when developing the IWRS. WRD coordinated with several state and federal entities to develop the original strategy in 2012, and policy advisory groups were convened to help develop both the 2012 and 2017 versions. However, some staff and stakeholders told auditors the document does not adequately discuss water equity and affordability issues.

Phase one of the 100-Year Water Vision attempted to address this concern by involving a more extensive public engagement process led by the director of OWEB. However, some communities may not have been adequately accounted for. After the 100-Year Water Vision's release, the University of Oregon partnered with nonprofits and community organizations to publish the Water Futures Report elevating water concerns of Black, Indigenous, people of color, and low income and migrant communities considered to have been left out.

Oregon's 2017 Integrated Water Resources Strategy
A framework for improving our understanding of Oregon's water resources and meeting our instream and out-of-stream needs, including water quantity, water quality, and ecosystem needs

(1) Understand Water Resources Today

- Objectives:** Further Understand Limited Water Supplies & Systems (groundwater, surface water, and their interaction); Improve Water Quality & Quantity Information; Further Understand Our Water Management Institutions.
- Critical Issues:** Understanding Water Resources / Supplies / Institutions.
- Recommended Actions:** 1.A. Conduct additional groundwaters investigations; 1.B. Improve water resource data collection & monitoring; 1.C. Coordinate inter-agency data collection, processing, and use in decision-making.

(2) Understand Instream and Out-of-Stream Needs

- Objectives:** Further Define Out-of-Stream Needs / Demands (i.e., diverted water); Further Define Instream Needs / Demands (i.e., left-in-place water).
- Critical Issues:** Understanding Oregon's Out-of-Stream Needs/Demands; Understanding Oregon's Instream Needs/Demands.
- Recommended Actions:** 2.A. Regularly update long-term water demand forecasts; 2.B. Improve water-use measurement & reporting; 2.C. Determine unadjudicated water right claims; 2.D. Authorize the update of water right records with contact information; 2.E. Regularly update Oregon's water-related permitting guide; 2.A. Determine flow needed (quantity & quality) to support instream needs; 2.B. Determine needs of groundwater-dependent ecosystems.

(3) Understand the Coming Pressures That Affect Our Needs and Supplies

- Objectives:** Economic Development; Water & Energy; Climate Change; Extreme Events; Population Growth; Water & Land Use; Water-Related Infrastructure; Education & Outreach.
- Critical Issues:** Water & Energy; Water & Land Use; Water-Related Infrastructure; Education and Outreach.
- Recommended Actions:** 3.A. Analyze the effects on water from energy development projects & policies; 3.B. Take advantage of existing infrastructure to develop non-traditional hydroelectric power; 3.C. Promote strategies that increase/integrate energy & water savings; 3.A. Develop and upgrade water and wastewater infrastructure; 3.B. Encourage regional (sub-basin) approaches to water and wastewater systems; 3.C. Ensure public safety/system safety; 3.A. Support Oregon's K-12 environmental literacy plan; 3.B. Provide education and training for Oregon's next generation of water experts; 3.C. Promote community education and training opportunities; 3.D. Identify ongoing water-related research needs.

(4) Meet Oregon's Instream and Out-of-Stream Needs

- Objectives:** Place-Based Efforts; Water Management & Development; Healthy Ecosystems; Public Health; Funding.
- Critical Issues:** Place-Based Efforts; Water Management & Development; Healthy Ecosystems; Public Health; Funding.
- Recommended Actions:** 4.A. Continue to undertake place-based integrated water resources planning; 4.B. Coordinate implementation of existing natural resource plans; 4.C. Partner with federal agencies, tribes, and neighboring states in long-term water resources management; 4.A. Improve water-use efficiency and water conservation; 4.B. Improve access to built storage; 4.C. Encourage additional water reuse projects; 4.D. Reach environmental outcomes with non-regulatory alternatives; 4.E. Continue the water resources development program; 4.F. Provide an adequate presence in the field; 4.G. Strengthen water quantity & water quality permitting programs; 4.A. Improve watershed health, resiliency, and capacity for natural storage; 4.B. Develop additional instream protections; 4.C. Prevent and eradicate invasive species; 4.D. Protect and restore instream habitat and habitat access for fish and wildlife; 4.E. Develop additional groundwater protection; 4.A. Ensure the safety of Oregon's drinking water; 4.B. Reduce the use of and exposure to toxics and other pollutants; 4.C. Implement water quality pollution control plans; 4.A. Fund development and implementation of Oregon's IWRS; 4.B. Fund water resources management activities at state agencies; 4.C. Invest in local or regional water planning efforts; 4.D. Invest in feasibility studies for water resources projects; 4.E. Invest in implementation of water resources projects.

Finally, pathways for how the IWRS will be implemented at the state or local level remain unclear. According to statute, WRD is responsible for developing the strategy, but statute does not specify how implementation is to be supported by WRD or other agencies and their various missions and boards and commissions. WRD's focus on water quantity and allocations makes it an important player, but the agency has lacked the authority, capacity, and formalized coordination mechanisms needed to ensure IWRS recommendations are implemented. Ongoing investment in the implementation of the IWRS has reportedly also been limited. The 100-Year Water Vision was initiated to garner more legislative investments in 2018, even though the IWRS update had been released just one year prior and remains in effect as of the publication of this report.

In developing a regional planning framework, creating a clear statutory connection between a state water plan potentially built on or converted from the IWRS and regional planning efforts could support the development of both, with regional plans informing the state-level plan and vice versa. Through tying a regional planning system to a state plan, state leadership and agencies could assist with the development of local and regional water policy and investment recommendations. This regional system tied to a plan could support the state's regulatory frameworks, encourage innovation, and ensure planning is happening at the appropriate scale. This actionable plan could also:

- Help sustain state agency focus and participation in integrated water planning, despite legislative and gubernatorial changes;
- Allow for monitoring and assessment of statewide desired outcomes;
- Help ensure various water interests and historically under-represented groups are included in decision-making, necessary for making state-level water decisions and supporting local stakeholder buy-in and ownership of the process; and
- Support practicality, transparency, and legitimacy in state-level priority setting, policy, and investment decisions.

The state should convene a formal planning and coordination body to guide the statewide plan and provide consistent support for regional needs

Oregon does not have a formal board or committee that is tasked with overseeing the state's water governance; individually, Oregon's natural resource agencies lack the breadth of knowledge, capacity, and authority to take on such an enormous task. Nor, as discussed, does the state have a regional framework in place that can support communication pathways between local communities, state agencies, and state leadership. Agencies that lack shared priorities and data and compete for limited funding can struggle to effectively coordinate.

Despite these limitations, state water officials have made diligent efforts to enhance planning and coordination. Several agencies pointed to the Natural Resource Director's Cabinet and the Water Core team as useful, albeit informal, mechanisms for high-level cross-agency coordination. In particular, the Water Core team allows agency leadership and staff to meet and discuss a wide variety of water-related topics. Several task forces and cross-agency teams have also been convened over the past few decades that primarily address specific needs like water use monitoring and drought response. These efforts are notable and demonstrate the commitment of Oregon's water nexus agencies and staff to effective stewardship of Oregon's water resources.

While helpful for participating agencies, since coordination efforts around governance tend to be informal, these efforts can lack transparency and clear direction. Neither the Water Core team nor the Director’s Cabinet have been formalized in statute or have meetings that are open to the public, and the Director’s Cabinet does not take meeting minutes. Without a formal alternative, there tends to be very limited public involvement or awareness around these efforts.

Chronic understaffing in several natural resource agencies has also contributed to difficulties with coordination. For example, ODFW was unable to consistently assign staff to help with place-based planning efforts led by WRD for several years. Each agency has their own policies, rules, and structures that are not necessarily designed to align with those of other natural resource agencies with whom they need to coordinate.



Columbia River. | Source: CCO Public Domain

The state’s informal and decentralized system can result in serious risks and harmful, costly outcomes, as demonstrated with the ongoing groundwater degradation in Morrow and Umatilla counties. The region has been a declared groundwater management area since 1990, when nitrate levels were determined to be rising beyond EPA-accepted safe levels for consumption.²³ Since that time, and despite some state involvement through the Oregon Health Authority, Department of Environmental Quality, and Department of Agriculture, the issue has only worsened. Potentially hundreds or thousands of private domestic wells in the area contain compromised water and will need filtration

²³ According to a review published in the International Journal of Environmental Research and Public Health, exposure to nitrates in drinking water can increase the risk of colorectal cancer and thyroid disease. There may also be an increased risk with ingestion of nitrate impacted water at or even below regulatory limits, which were set to protect against infant methemoglobinemia but do not factor in other risks. See [Drinking Water Nitrate and Human Health: An Updated Review - PMC \(nih.gov\)](https://pubmed.ncbi.nlm.nih.gov/35811111/)

systems installed at significant cost. Even the presence of a state-supported, locally based groundwater management committee tasked with developing voluntary action plans has not helped; see page 61 for community perspectives.

Stronger interagency coordination can also help with getting stakeholders and communities involved in decisions that directly affect them. The responsibility for balancing stakeholder interests, sometimes against the public interest, has been delegated to individual agencies, which may not have the capacity, influence, or knowledge base to effectively engage. Only a few agencies that responded to our questionnaire included the general public in their list of key stakeholders. Other agencies work closely with specific stakeholder groups, like agricultural entities, but have limited interactions with communities outside of those relationships. Agencies need overarching guidance, clear expectations, and support to better engage with communities.

Some other states have designated non-regulatory state boards focused on leading statewide water plan development and implementation. They partner with regional planning bodies which support community engagement. These boards also perform other functions to support a variety of local and regional water needs. For example, Colorado's water planning board provides data, technical assistance, and grants to support regional plan development and implementation. The board has approximately 50 staff working to advance Colorado's Water Plan and provide this level of planning support to Colorado's regions. See page 47 for more on the Colorado planning framework.

Oregon also needs to ensure there is an appropriate balance of interests represented in any statewide or regional water management and planning efforts. One example of a broadly inclusive entity focused on water exists in Oregon, though to serve a much narrower function: the Oregon Watershed Enhancement Board. When Oregon sought to continue integrated grant-making for local watershed enhancement and restoration projects, the Legislature set up the Watershed Enhancement Board with a mission devoted to that charge and a balanced board to sustain the effort in 1999.

Should Oregon create a statewide planning and coordination body, it is important that the state learn from the lessons of the past. As noted previously, water management groups in Oregon have been convened and disbanded by the Legislature with ultimately little to show for their efforts. However, establishing a planning and coordination body can help the state with broad stakeholder engagement and improving capacity around water planning, particularly at the state level.

As part of a robust framework, the state should consider how to staff and structure an entity to help guide statewide and regional water planning. The state should aim to develop a body that meets Oregon's unique water planning needs, is set up to support strong interagency and multi-level coordination and boasts a diverse and balanced representation of public interests. Such an entity would also need a clear charge tied to planning for water security, adequate staffing and resources, and appropriate authority to carry out their charge. This would be a valuable asset to a statewide regional planning framework.

Good water governance supports a healthy state economy

Water's full economic value for Oregon is immense and difficult to quantify. Every sector, every business, every community, and every household in Oregon depends on adequate, clean, and reliable water. Water plays an important role in creating wealth and jobs across the state and contributes to the economy in many ways, such as supporting business productivity, providing a range of environmental benefits, and contributing to public health and cultural and community well-being. Sound water governance is critical for supporting the state's economic stability and can help balance current needs and values against changing water conditions and ensure the state is prepared to meet long term water needs.



Fly Fishing on the South Santiam | Source: Pete Forsyth

Estimating the full value of Oregon's water is difficult, if not impossible; however, some studies considering statewide industries and others examining specific waterways help illustrate aspects of water's importance. For example, Oregon State University's College of Agricultural Sciences attributes about 20% of Oregon's jobs and 13% of the overall state economy to agriculture and related industries, which requires safe, adequate water supplies.²⁴ Another study examining the North Santiam Watershed, just one tributary within the Willamette River basin in western Oregon, estimated the watershed's

²⁴ Oregon State University College of Agricultural Sciences, 2021 "Oregon Agriculture, Food and Fiber: An Economic Analysis" https://agsci.oregonstate.edu/sites/agscid7/files/main/about/oragecon_report_2021.pdf

approximately 500,000 annual recreational visits generate around \$36.5 million. Dam generated hydropower was estimated at \$7.8 million and avoided CO2 emissions associated with hydropower generated \$19.8 million in 2017.²⁵

Working to ensure Oregon's watersheds and basins are healthy and able to provide clean water to communities and local ecosystems has substantial economic benefits. State and locally supported watershed restoration and natural infrastructure investments provide distinct benefits for the economy in addition to the environment and local communities. According to a 2010 University of Oregon study, every \$1 million of public investment in clean water and restoration creates about 15 to 24 jobs.²⁶

An analysis performed by the National Oceanic and Atmospheric Administration estimated one natural infrastructure project — funded partly by OWEB just north of Tillamook Oregon — supported 108 jobs and \$14.6 million in total economic output for the state over four years.²⁷ Through restoring wetland habitation and reducing seasonal floods, the project's multiple benefits include improving water quality by decreasing sediment in Tillamook Bay; enhancing social and cultural benefits for recreational fishing, hiking and kayaking; and increasing nearby home values. It may also support millions of dollars in economic value through increasing the abundance of salmon populations in the bay.

²⁵ ECONorthwest, 2019, "[Importance of Water in the North Santiam Basin. An Economic Description.](#)"

²⁶ University of Oregon, 2010, "[Economic and Employment Impacts of Forest and Watershed Restoration in Oregon.](#)":

²⁷ Shaw, Graham R. and Dundas, Steven. J. (2021) [Socio-Economic Impacts of the Southern Flow Corridor Restoration Project: Tillamook Bay, Oregon.](#) Garibaldi, OR: Tillamook Estuaries Partnership.

Agency roles and responsibilities in state and regional water plan development and implementation need to be clearly established

According to water governance principles, roles and responsibilities across all levels of government and water-related institutions should be clearly specified. Auditors heard a range of responses from state agencies on the state's role in planning for and promoting water security. Many described the fragmentation in how the state contributes — some agencies emphasized the state does not have sole responsibility, while others suggested the state had a high degree of responsibility.

Of the 13 agencies we heard from, only one pointed to the IWRS in describing the state's role, despite its purpose as an important integration mechanism for the state. Clarifying the entire state's role in planning to address water security challenges could both help the state understand its role and the need to coordinate around achieving actionable milestones. The state's role in supporting the process, providing technical assistance, funding and implementation support for existing plans should also be clearly defined.

Agencies like WRD and the Department of Environmental Quality will need to play key roles in the development and implementation of statewide and regional water plans. However, the state should consider assessing how each water agency should participate in regional water planning, and the specific roles they should play.

For example, WRD has acted as the central agency for statewide water strategy efforts since 2012. However, the agency's regulatory responsibilities and other priorities could risk distracting its attention from planning efforts, and risk skewing its perspective on integrated water planning. WRD also lacks the authority to compel other agencies to participate in planning implementation. For statewide water planning to work, engaging stakeholders and balancing their needs in making water decisions is critical. WRD's obligations to senior water rights holders as a primary stakeholder could interfere with the agency's ability to lead statewide, integrated water planning and implementation efforts to promote water security and equity.

Furthermore, while having WRD as the primary planning entity elevates the importance of water planning within that agency, it may not have that effect for other water agencies. WRD leadership told auditors they consider the IWRS to comprehensively address water needs, but other key water agencies do not. Several agencies told the audit team they have not incorporated the IWRS into their existing strategic plans and do not take it into consideration in their programming.

If the state establishes a regional planning framework centered on shared water security and equity priorities, all of Oregon's water agencies will need to consider how their missions and functions align with those priorities. These agencies will also need to prioritize and clearly understand their involvement in statewide and regional water planning. As part of a regional planning framework, the state may consider conducting a systematic risk assessment examining agency missions, core operations, and staffing. This could help ensure a higher level of accountability and transparency, identify redundancies and gaps in service, and provide further guidance on how to integrate Oregon's water agencies into a state and regional framework.

Oregon must balance interests and address high-priority water security needs by ensuring community inclusion in management decisions

The contentious nature of water and various stakeholders involved requires balancing conflicting interests through meaningful stakeholder engagement, a core good governance principle. This means mitigating power imbalances and weighing feedback from over-represented groups. It also means there will be times when the state needs to display clear leadership on making tough water decisions. A state and regional water planning framework should also help manage trade-offs across water users, rural and urban areas, and generations.

Currently, Oregon lacks the kind of structure and planning approach that would allow more communities to be involved in decision-making on a consistent and reliable basis. There are numerous local efforts to coordinate water management, such as the collaborative water planning efforts taking place in the Deschutes Basin. However, other parts of the state may find it difficult to stand up a localized approach to water planning and management, let alone one that includes all critical parties. State assistance and guidance may be necessary, particularly where there are concerns about certain communities being left out or intentionally excluded.

Figure 6: Oregon's Place-Based Planning pilot served four partial planning areas of the state's 18 administrative basins



Source: WRD

The piloted place-based planning process has required accepted applicants use a local convener to balance interests in accordance with criteria developed by WRD. As a voluntary, locally initiated process where community groups determine the geographic area of focus, place-based planning is not designed to encompass the entire state or necessarily prioritize planning for communities most urgently in need. Even if this competitive grant program is extended beyond the pilot, it is not clear all areas of the state in need of support will be able to successfully apply and engage in the process.

This risk is heightened by the fact that powerful water users in some area of the state may not be motivated to participate or could skew representation. It is also unclear how the plans developed will inform a state-level water plan and vice versa. A statewide planning structure that incorporates all areas of the state, such as regional bodies for each area, could help ensure representation while balancing interests by those participating. This could also help ensure all priority water needs are addressed.

An example of a structured statewide approach that could help address these concerns is Colorado. Colorado's state and basin level organizational structures for water planning are intertwined to support actionable water plan development, implementation, and balancing interests in water policy decisions. The state's water plan helps guide statewide actions, and roundtables draft implementation plans for each of the state's nine basins; these basin plans feed into the statewide plan and are in turn informed by it. A state board whose voting members consist mainly of basin roundtable representatives is responsible for leading the development of the state's water plan and a separate 27-member policy committee further supports taking a statewide perspective across basins. The committee is designed to provide a diverse and balanced forum for water policy input at the state level.

Ensuring local communities are involved in statewide and regional planning efforts can also help bring in more resources and innovative solutions to address water concerns. Over \$1 billion has been invested in watershed health and enhancement in Oregon over the past 30 years. Local organizations like watershed councils and soil and water conservation districts have worked with landowners and used these funds to improve water quality and watershed health. The state needs to support building more opportunities for communities to participate in developing local water solutions.

Local Perspectives: North Coast Region

The Audits Division worked with North Coast Communities for Watershed Protection (NCCWP) to interview community members from a number of coastal cities, including people from Manzanita, Wheeler, Rockaway Beach, Garibaldi, Nehalem, and Netarts. Forestry, agriculture, and tourism are major industries in the region, which is largely rural with several small and medium sized communities. The North Coast gets substantial amounts of rain during the winter months but can be subject to dry spells in the summer. Many water users depend on surface or groundwater sources that are vulnerable to saltwater intrusion, drought, or the impacts of industrial and agricultural practices.

Residents voiced many different concerns about impacts to their drinking water, both on city systems and on private wells. Most prominent among these were the impacts of forest practices on watershed health and water availability in the coast range: the destruction or loss of water sources to private residences; environmental impacts; potential human health impacts caused by spraying pesticides in and around clear cuts; increasingly unaffordable water bills; longer periods of drought limiting water supplies for communities and water systems, particularly during the summer months; increased water demand from new development and short term rentals; and a lack of responsiveness on the part of state agencies tasked with regulating forestry operations and protecting water quality.

NCCWP members we spoke with wanted more transparency from the state and local industries on when practices like clear cutting and pesticide spraying happen and how they might impact communities. They wanted local water sources to undergo testing to ensure water quality and safety. They also wanted more clarity and support from the state on how they could effectively engage with local and regional water and land management decisions that impacted both their personal and community welfare.

Nancy Webster

Nancy grew up on the Oregon Coast and chose to retire in Rockaway Beach. She and her neighbors became concerned about clear cutting they noticed taking place in the Jetty Creek Watershed, which is a primary source of drinking water for Rockaway Beach. She also began to receive notices with her water bill that her drinking water had exceeded EPA limits for total trihalomethanes.²⁸ Rockaway Beach issued 19 alerts between 2005 and 2013 before enhancing the city's filtration system in 2014. That same time saw significant cutting in the Jetty Creek watershed — ultimately, over 90% of the watershed was cut between 2000 and 2021.²⁹

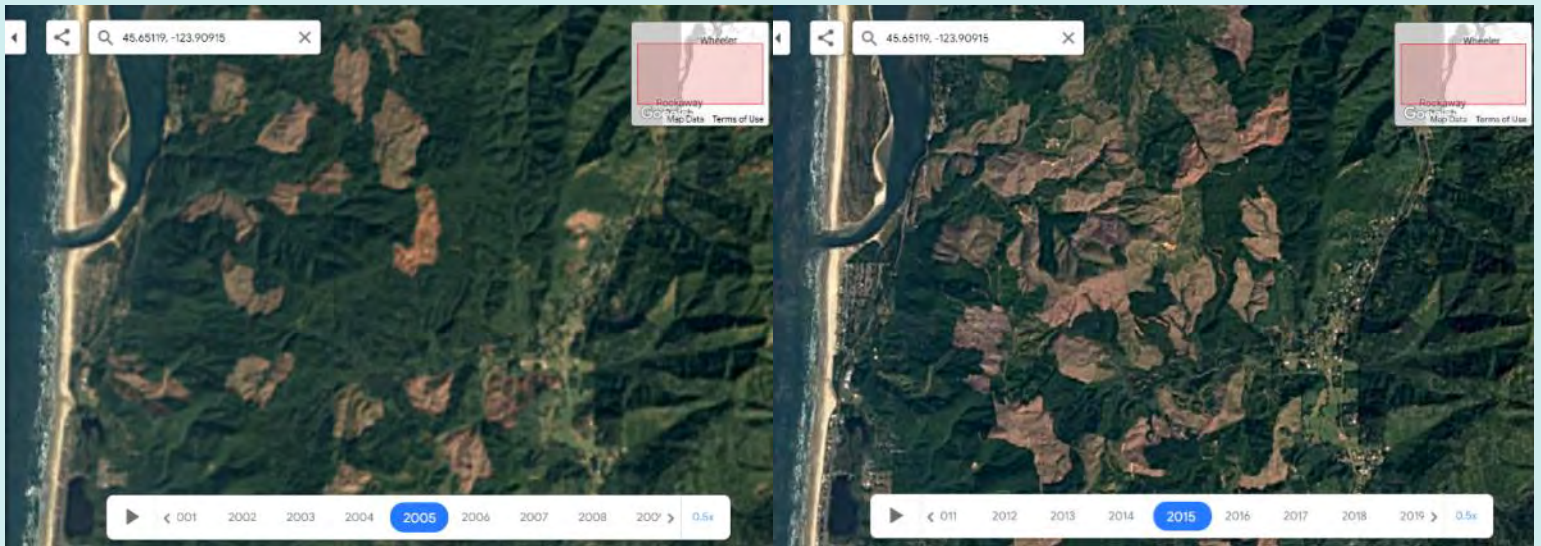
Nancy and other Rockaway Beach residents formed Rockaway Beach Citizens for Watershed Protection. They soon began to hear from communities all over the North Coast region concerned about water insecurity and damage to their own watersheds. The group expanded and became NCCWP, which now includes approximately 900 community members from Oregon's North Coast region.

NCCWP has pursued conversations with city officials and several state agencies, spoken at board meetings and local watershed council meetings, gathered signatures for petitions for state help, and

²⁸ According to the EPA drinking water notice, some people who drink water containing trihalomethane in excess of the maximum containment level over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

²⁹ See [Appendix H](#) for Timeline of Events in the Jetty Creek Watershed.

filed numerous complaints about practices that could impact drinking water. Nancy stated, “none of these agencies were able to offer any significant monitoring, help, or protection,” but she believes “most of these state agency employees would like to help protect public water supplies.”



Left: A portion of the Jetty Creek Watershed was clearcut in 2005.

Right: By 2015, a substantially larger proportion of the Jetty Creek Watershed had been clearcut. | Source: Google Earth

John Rogan

John Rogan has owned a home in Netarts since 2014. The original water source for his home came from an intake on Hathaway Creek. When a large storm hit the coast in December 2015, the embankment of a road on a clear cut above their property came down in a landslide, which dammed the creek. Shortly after, the dam failed and “sent a torrent, some 40 feet high, of mud, rocks and trees down the creek onto our property as well as our neighbor.” John and his wife had to evacuate immediately on foot; the damage to both properties was extensive and destroyed John’s water supply.

The timber producer did purchase a new water system. However, due to the damage done to the creek bed and surrounding areas, the system was unreliable and required continuous maintenance. Ultimately, John had to put in a well, at substantial personal cost.

John learned in 2020 the same timber producer planned to clear cut a steep slope directly above his house. The company had been given permission to proceed by the Department of Forestry.

From John’s perspective, “... Not only do our communities benefit less from timber harvests, but they are at times adversely effected by some questionable practices. Nor does it seem that as things now stand, can the community expect much in the way of protection from the Oregon Department of Forestry or from the Legislature. It is time for a change.”

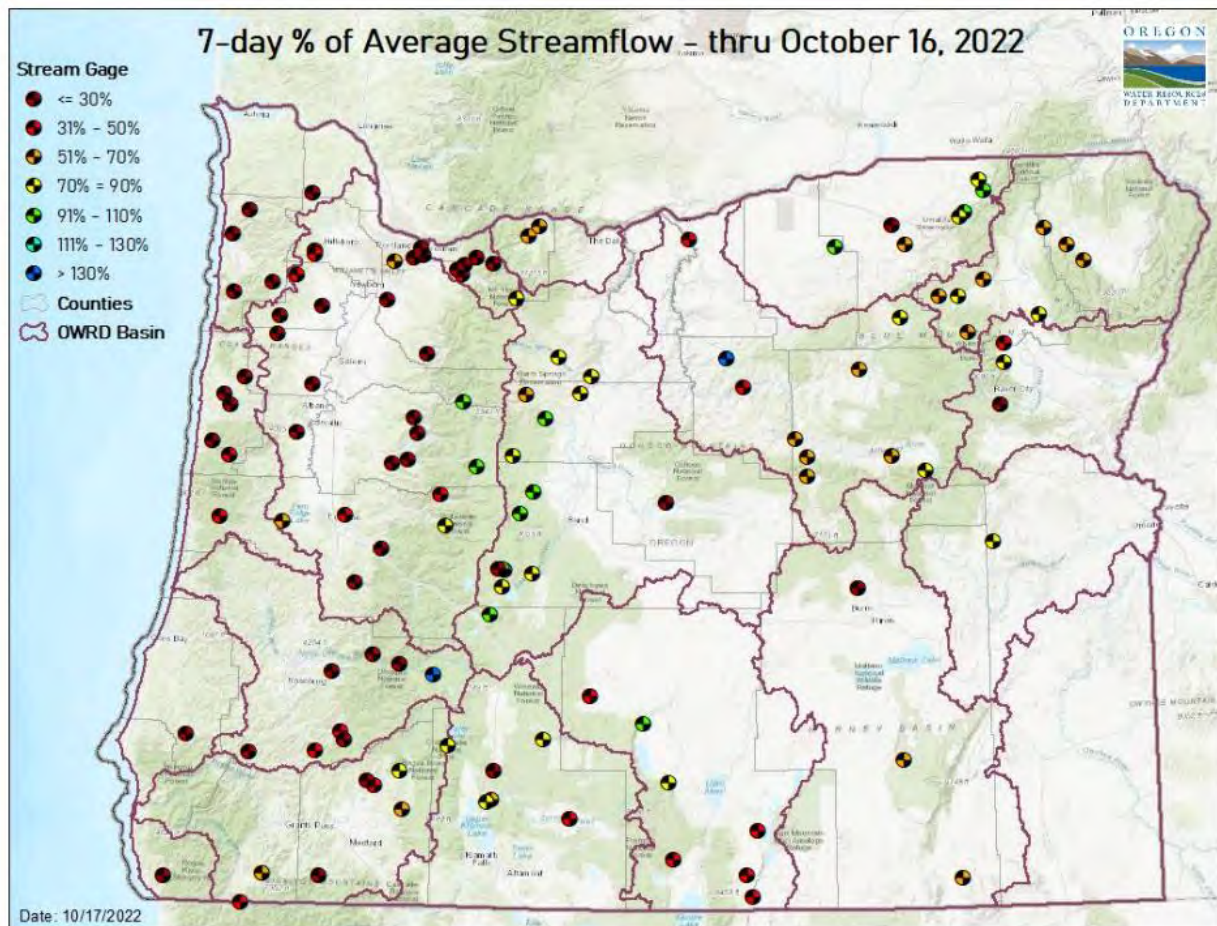


Public awareness and understanding of the state’s urgent water challenges must be enhanced

According to a statewide survey conducted by the Oregon Values and Beliefs Center in July 2022, almost half of respondents considered there to be “enough water in Oregon to meet current needs,” while a third disagreed with that statement. Only 36% of respondents believed Oregon has enough water to meet future needs. The survey shows many Oregonians have some awareness of the state’s perennial and growing water concerns; it also shows many Oregonians consider water security to be a problem for future generations, not necessarily a pressing concern, despite ample evidence showing water insecurity is here and already affects many people across the state.

Efforts on the part of state agencies to work with and educate the general public have largely been limited to participation in programs for school-age children, such as the Children’s Clean Water Festival and Outdoor School, and direct interface between their staff and the public as part of other professional responsibilities. However, the IWRS acknowledges “education and outreach efforts by state agencies and their partners should be targeted to all age levels and should address water quality, water quantity, and ecological needs and issues.”

Figure 7: Information on stream flow in Oregon is available online. Most Oregon streams were running well below seasonal average in October 2022



Source: WRD

WRD had little historic capacity to raise public awareness directly. According to agency leadership, WRD relied on its stakeholders and partners to raise awareness among their members. In 2021, the agency received funding for two additional staff to help build a communications program to bolster public awareness of drought and other water security concerns. Other agency representatives stated their work around public engagement was largely limited to their stakeholders. However, there is no comprehensive communication effort in place to educate the general public on water insecurity.

Lack of education and knowledge around water issues is a barrier to meaningful community involvement. Not everyone facing water insecurity is fully aware of the risks this presents to themselves and their communities. For instance, groundwater in parts of the Lower Umatilla Basin has been impacted by nitrates for over 30 years, yet many community members the Audits Division heard from were long unaware their well water could be compromised. The state has known this for decades. Many of these individuals only became aware when the county and Oregon Rural Action, a local community-based organization, began going door-to-door to conduct well testing and inviting community members to public meetings to discuss their findings and concerns. Residents in Oregon's North Coast region faced difficulties communicating with state agencies regarding their own water quality concerns, and even in identifying which state agencies they should communicate with. More information can be found in our local perspectives sections.

This gap in public knowledge is a dangerous shortcoming on the part of the state. Lack of public awareness creates avenues for special interest groups to push for policies and practices that benefit specific stakeholder groups and are not necessarily in the public's best interest. Inadequate state collaboration with communities also creates barriers to finding and applying innovative solutions to local and regional water security concerns. Enhancing public awareness can help the state more transparently engage with communities on water issues that impact them.

State leadership needs to explore options for creating a robust approach to raising public awareness. This could potentially include seeking funding for programs like OHA-PHD's Domestic Well Safety Program, creating or contributing to public awareness campaigns around community water security, and factoring public awareness needs into state and regional planning efforts.

[State leadership should adopt the human right to water into law and explore other policy changes that could help protect community and ecosystem health](#)

The right of all people to access water to meet their basic needs is not clearly protected in Oregon law. The Water Code indicates, but does not state explicitly, the Oregon Water Commission can decide whether human and stock animal water needs take precedence in certain situations, and drought declarations through the Governor's Office can trigger decisions to protect those needs. Outside of these special circumstances, however, senior rights take precedence, no matter how the water gets used. Oregon water policy tends to lack some coherence; water laws are not necessarily aligned or fully supportive of sustainable outcomes.

Oregon has made some recent efforts to address water security and equity more systematically in state policy and practice. Even before the Environmental Justice Council was formalized in 2021, Oregon's natural resource agencies were required to draft annual environmental justice reports detailing their efforts to achieve environmental justice goals set by the Environmental Justice Task Force. Some agency programs are also designed to address water security concerns for specific

groups, such as the focus of the Oregon Health Authority’s Drinking Water Services program on community water systems. However, these programs are not part of a broader initiative to enhance statewide water security and equity. This limits their overall effectiveness, as these programs are not always able to serve, or may only provide limited support to, Oregon’s most vulnerable populations.

One policy option the state could consider now is to enshrine the human right to water in statute. This could help establish the Legislature’s clear commitment to addressing water security and equity concerns in the long term. In 2010, the United Nations General Assembly formally recognized the human right to safe drinking water as part of binding international law. The right to water “entitles everyone to have access to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use.”

In 2012, California became the first state to legislatively recognize the human right to water and declare that clean, safe, affordable and accessible drinking water was a fundamental right for all residents. While the law does not grant specific water rights to all residents, to help enact the new law, California developed a framework and tool to assess community water needs across the state and to monitor progress. In 2021, the state released a report quantifying which communities were struggling with water quality, accessibility, and affordability needs and which needed priority attention. California’s framework lacks at least one important piece: rural domestic well owners and very small water systems are not included in the analysis. However, having this kind of information and tool available could provide Oregon with information critical to making important decisions about the allocation of water funding and state resources. It would also clearly demonstrate the state’s commitment to pursuing long-term water security for all Oregonians.



Rivers and Trees in Oregon. | Source: CCO Public Domain

Areas of existing Oregon water policy may also need revisiting. For example, junior right holders and those without specific water rights may be adversely impacted by the water use of senior right holders who choose to use their full allotment without regard to other water users in a basin. As mentioned

previously, the state's administrative basin programs also have not been regularly updated in many years. This means that the state's water basin rules are dependent on decades' old basin studies that may not reflect current conditions. As much of the state's surface water has already been allocated, water rights transfer rules and processes must also take the public interest into consideration.

Oregon needs to explore ways to better incentivize the protection of water-based and water-dependent ecosystems. Some policies that could address some of these concerns have been proposed by policymakers at the federal level, such as the River Democracy Act that aims to expand Wild and Scenic Rivers protections to an additional 3,000 miles of Oregon rivers and streams. Similar or aligned efforts at the state level may enhance the protections promoted by such federal actions.

State leadership will need to proceed with caution and work closely with state agencies to ensure policy changes have the intended effect. Water efficiency efforts like installing pipes instead of canals are sometimes touted as an effective water conservation tool for farmers and may help reduce water loss during irrigation and increase water that stays instream. However, these activities could have unintended consequences that harm communities and ecosystems, like reducing aquifer and stream recharge from leaks in canals. According to WRD, the concept of conservation is sometimes oversimplified without considering the whole picture.

The 2021 funding package was criticized for failing to include more conservation funding opportunities. By creating thoughtful, evidence-based community and ecosystem protection incentives in policy, the state could help agricultural communities better adapt to diminishing water supplies without doing further harm to local ecosystems.

Additional policy changes that can strengthen some of the weaknesses in Oregon's water governance should be considered — such as policies that support integrated and reliable data, clear funding strategies, and better public representation in decision making around water. The Legislature must also account for the current and inevitable impacts of climate change in any future water resource decisions. Recent changes to Oregon's land-use and housing laws support reducing greenhouse gas emissions, sequestering carbon, increasing community resilience, and a more equitable distribution of environmental benefits and burdens; pursuing complementary water policies can strengthen the impacts of these legislative changes. Having a regional planning framework in place can support meaningful and effective policy decisions and create avenues for regional input into policy.

Local Perspectives: Harney County

Harney County, where agriculture is the primary industry, has struggled with groundwater shortages for several years. In 2016, WRD began a groundwater study in the region with the assistance of the United States Geological Survey and found a substantial imbalance between available groundwater and water use by irrigated agriculture. The basin has also participated in WRD's place-based planning pilot program.

Christine Bates

Christine has lived in rural Harney County with her family since 2009 when she became the fish and wildlife biologist at the Burns District Office of the Bureau of Land Management. She has been engaged in regional water management work and planning in the Harney basin for over a decade, including serving as chair of the Harney County Water Council, performing riparian work for the Bureau of Land Management, and participating in the region's place-based planning efforts with WRD.

When a large alfalfa farm moved in near their home, the operation began installing numerous irrigation pivots in their fields. Farms like this one can use a substantial amount of water from wells that are 300 to 400 feet deep. Christine and her neighbors on domestic wells cannot afford to go that deep to compete for water.



Burns Area Field | Source: Gary Halvorson, Oregon State Archives

Christine's home is served by a private well first dug in 1981. When they purchased the property in 2009, the water level in the well was at a depth of 14 feet, sufficient for her domestic water needs. In 2016, the water level had dropped to a depth of 33 feet and has been dropping since then. She has

since had to deepen her well to 160 feet (the water pump is now at 80 ft) to prevent losing water to their home. Before the new well was put in, they had to haul water for themselves and their livestock. To pay for the new well, the family sold their cattle. The water pump's depth also requires more electrical use, and their bills have gone up and put added pressure on her family as a result. Several local landowners also come to their well to fill up water tanks for their livestock since their own wells have gone dry.

Well owners in the area must be careful about putting in wells to the correct depth so they can preserve water quality, and many cannot afford to deepen their wells. Arsenic levels in some wells have risen above EPA safety limits in recent years. She has installed a reverse osmosis system for drinking water, but her household “bathes in arsenic.” Her family cannot afford a full well filtration system for arsenic.

Christine has spoken with a number of people employed by the State of Oregon about the loss of water in her well. However, in Oregon, private well owners have little leverage to act. She is concerned that her lack of water rights mean she cannot protect her access to water.³⁰ She also watches for endangered fish in the streams, and notes that springs in Harney County are drying up. Wildlife are seeking water in stock tanks to stay alive.

Christine grew discouraged with the Harney Basin place-based planning efforts and in early 2021 she stopped attending meetings. “They weren’t accomplishing anything... it turned into Groundhog’s Day.”

Christine shared some of her neighbors “saw the writing on the wall” and were leaving the area. However, families like hers do not necessarily have the resources to leave. The water loss in her well causes her great frustration and anxiety. “Water for domestic users should be a right and is our important requirement for life and overall happiness... Time is ticking, and we are rapidly draining the aquifer.”

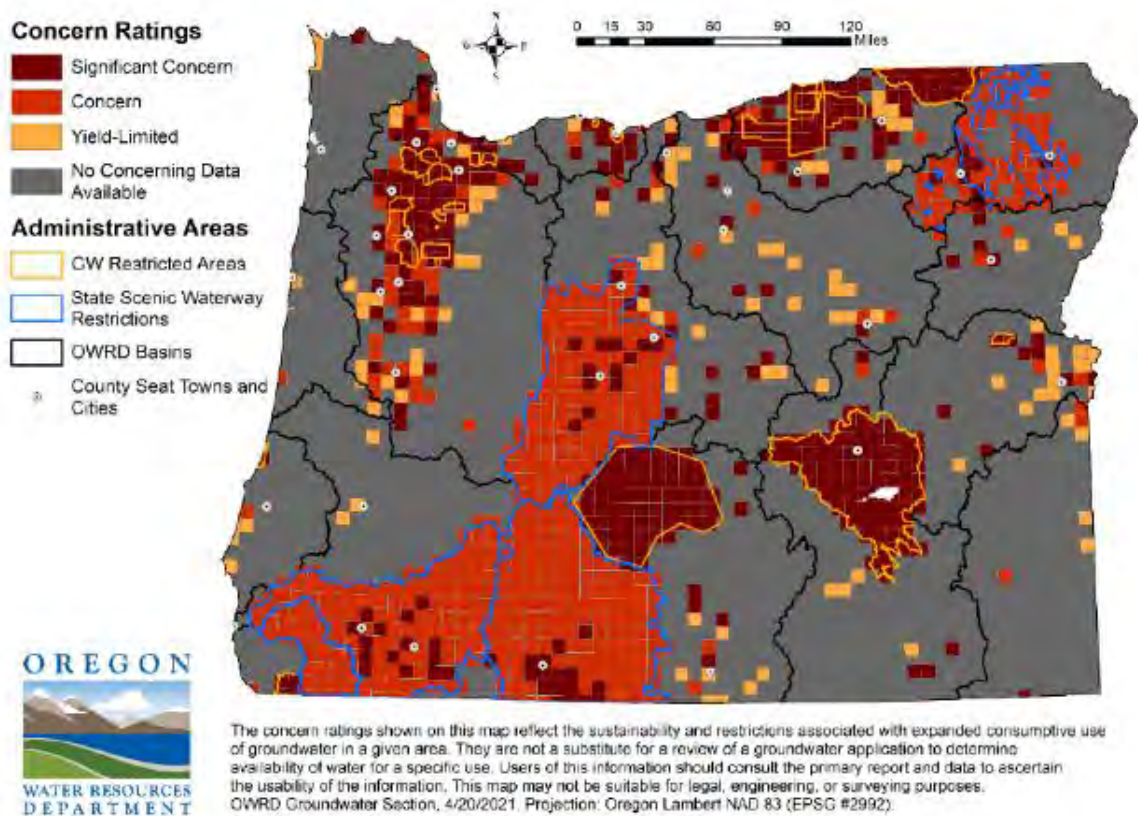
³⁰ Domestic well owners in Oregon have some protections under the law that can mimic a water right. However, most domestic wells have not fully developed an aquifer or other water source, an action that could allow the state to regulate other users and provide more proactive protections to the well owner.

Improved water data can help Oregon agencies and communities better understand statewide and regional water needs

Having good water data is critical to supporting effective water planning and management decisions; however, this has been an ongoing challenge for decades in Oregon, in part owing to the lack of a state water management plan and de-centralized approach, and in part due to a lack of funding for data needs. Data is being collected and retained by different agencies for different purposes using different units of measure with gaps where agencies have not been authorized or funded to collect it. Efforts are underway to make progress toward addressing water data needs, but success will depend upon continued prioritization and funding by the Legislature.

The 2021 evaluation of the place-based planning pilot found critical data needed from the state was unavailable and delayed or hindered plan development, which took years longer than anticipated. According to the report, groups had difficulty determining which agencies have what data, where data are kept, and locating data among many agencies that do not share it. In some planning areas, the most up-to-date studies were from 1975. WRD does not regularly update basin studies, which were used to provide extensive data for each basin.

Figure 8: Significant data gaps, depicted in the grey areas, leave Oregon with little understanding of available groundwater across most of the state³¹



Source: 2021 WRD Groundwater Resources Concerns Assessment

³¹Not enough reliable data has been collected within most of the Townships in the graphic's gray areas to determine the level of groundwater concerns. However, 5% of those Townships are known to not have any current concerns, according to WRD.

Furthermore, the state's role for supporting place-based planning, including whether the state should help with data on planning, remains unclear, unlike some states like Colorado, where the state Water Conservation Board provides critical technical support to its regional and statewide planning efforts.

Colorado's Water Conservation Board, the state's water planning and policy agency, leads the state's supply and demand projection data and tools underpinning the state's water plan. The 2019 technical update built on 15 years of state supply planning initiatives, to support evaluating Colorado's future water needs. Their work provides tools and data for the state's nine regional Basin Roundtables to update their implementation plans and develop detailed local solutions to supply and demand gaps.

Oregon began a promising project in 2021 to address water data needs. The project was funded through June 2023 to accomplish three goals:

1. Begin initial scoping and design of a database framework of water and infrastructure data;
2. Develop a funding request for further development of this database framework; and
3. Position the participating agencies to immediately pursue project goals in the 2023-25 biennium, pending legislative approval.

The Department of Environmental Quality is coordinating the project and has secured the Oregon Institute for Natural Resources and Duke University's Internet of Water as full project partners. Both organizations have direct experience with water data systems. As reported by the Department of Environmental Quality, one of the most anticipated deliverables for the June 2023 final report will be a prioritized, working inventory of water datasets needed. Although past efforts have been made, they were incomplete for this inventory purpose and will be used to build upon in the current project.

The inventory will evaluate the status of each data set necessary to make water and water infrastructure decisions. Some data sets may need significant effort to make them available for a centralized water data framework, and some may be uncollected because no agency currently has authority or funding to do so, or they are not available for all parts of the state. The Legislature may need to provide authorization and funding for agencies to fill the identified gaps. The Department of Environmental Quality reports the intention to reach out to stakeholders for their input, both immediate and long-term — having a regional framework could help with this, both for deciding what data is needed and helping to collect data.

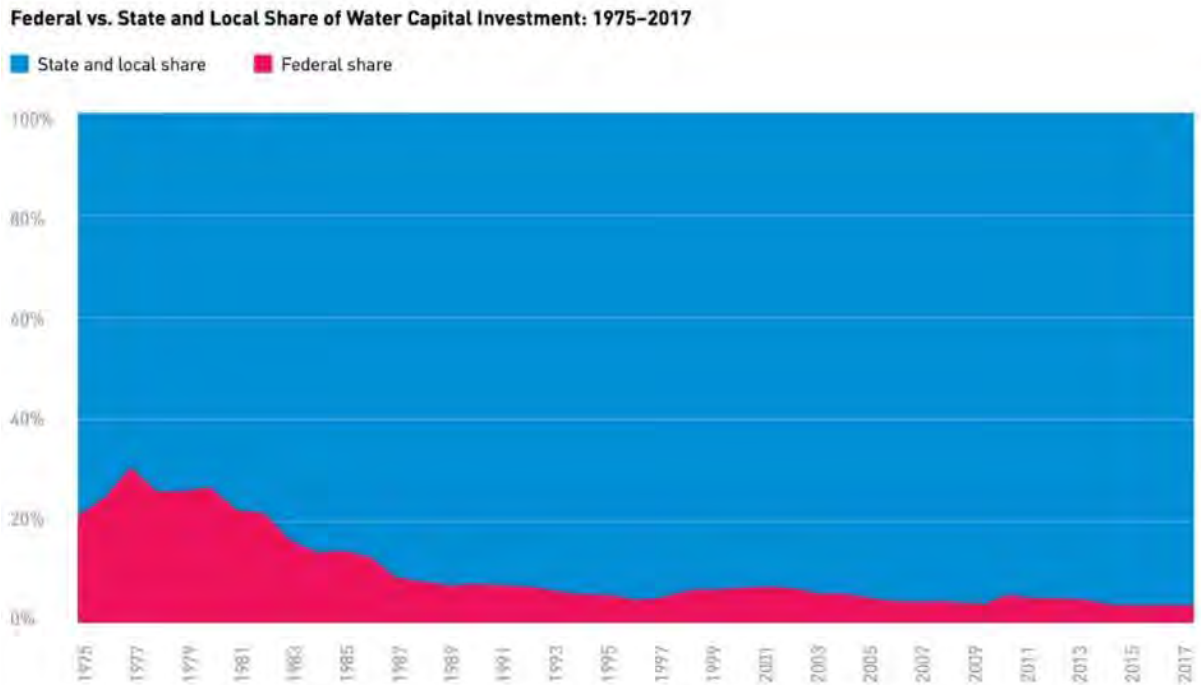
House Bill 5006 recognized that although this project was funded as a one-time appropriation, it is likely to become a significant information technology project. The Department of Environmental Quality will develop a policy option package placeholder in the 2023-25 Agency Request Budget with more recommendations on scope and location of resource needs to be detailed in the preliminary report to the Legislature in early 2023.

[Oregon urgently needs a strategic approach to water funding and a consistent funding base to support desired outcomes](#)

One critical component of water security is affordability. Oregon, like other states, faces considerable water affordability and funding challenges that require strategic and coordinated state action to address. Since the 1970s, federal support for water infrastructure projects has declined and shifted

from grants to loans administered by the states as the need to fix and upgrade aging water infrastructure increases. Local governments and residents have had to bear the financial burden.

Figure 9: The federal share of total investments in water infrastructure fell from 31% in 1977 to 4% in 2017



Source: Congressional Budget Office, "Public Spending on Transportation and Water Infrastructure, 1956 to 2017," in Value of Water Campaign and American Society of Civil Engineers (ASCE), "The Economic Benefits of Investing in Water Infrastructure: How a Failure to Act Would Affect the US Economic Recovery" (Value of Water Campaign, ASCE, 2020), http://uswateralliance.org/sites/uswateralliance.org/files/publications/VOW%20Economic%20Paper_1.pdf.

In response to national water infrastructure challenges, Congress has increased appropriations for federal financial assistance programs as the state has contributed additional funds. The 2021 state legislative session provided a historic investment in water, allocating \$411.5 million in federal and state funding to local infrastructure projects. In November 2021, The U.S. President signed a new federal Bipartisan Infrastructure Law allocating \$50 billion to improving the nation’s drinking water, wastewater and stormwater infrastructure, the largest investment in water ever made by the federal government. Funding will be provided over five years through a combination of loans and subsidy or “forgivable loan” akin to a grant, with the bulk of subsidy targeted to disadvantaged communities. In 2022, Oregon received \$92 million; the state is slated to receive similar amounts in the following four years.

While these investments are significant, they fall far short of meeting estimated national and state infrastructure needs. For example, the American Water Works Association has estimated \$1 trillion in costs over 20 years to repair aging infrastructure for drinking water alone and expand water services to meet growing demand. Stakeholders also told auditors the 2021 legislative investment was not enough. A 2021 study published by Portland State University estimated \$23.5 billion in long-term costs for maintaining and upgrading Oregon’s city water and wastewater facilities.³²

³² [2021 Infrastructure Survey Report. Portland State University. January 2021.](#)

Many communities also face challenges in accessing new and existing federal funding opportunities channeled through the state. A key priority under the law for the added federal funding is ensuring disadvantaged communities benefit equitably, recognizing low-income communities and communities of color experience disproportionate impacts of pollution, including through water. Concerns have been raised that local match requirements in the new law, which are cash or in-kind contributions that a grantee is required to contribute to project costs, could impose burdens on lower capacity communities seeking federal grant money.

Funding programs administered by the state of Oregon may not benefit communities unaware of opportunities and state requirements and processes. Rural Community Assistance Corporation, a nonprofit technical assistance provider working with rural and Indigenous communities, told auditors the demand for their assistance exceeds their available supply. Community needs cover the entire spectrum of technical, managerial, and financial aspects of running a community water or wastewater system. According to the nonprofit, most communities in Oregon they have worked with do not know how to apply for funding, especially smaller and low-income communities. Some smaller communities also lack the economic leverage or population size to be eligible for current grants and loans.

Outreach is required to disadvantaged communities who may not be aware of technical assistance programs and how to access them. A policy director for a national nonprofit focused on water sustainability told auditors no state is well prepared to handle the additional funding, with capacity challenges and broader systemic and structural barriers that prevent communities from applying. According to the Oregon Health Authority, smaller public drinking water systems generally face more water quality challenges and compliance issues due to a lack of financial, managerial, and operational capacity. Some of these systems do not possess the capacity to even apply for or borrow and repay the state revolving fund loans with significant principal forgiveness available for disadvantaged systems.

Some state agencies also face challenges in obtaining funding to support the capacity needed to carry out their main functions. About 2% of Oregon's legislatively approved budget goes to Oregon's 12 natural resource agencies. An even smaller proportion of state funds goes to agencies that regulate Oregon's water quantity and quality. Agencies must compete for funding and can struggle to fulfill their regulatory responsibilities important for water security.

According to natural resource agencies the team surveyed, agencies reported experiencing considerable funding challenges, including funding cuts and fluctuations resulting in reduced capacity and inadequate staffing. For example, the Oregon Department of Fish and Wildlife reports it lacks the resources to conduct the studies and to resolve protested instream water rights applications through settlements or contested case hearings, leaving many Oregon streams without legally protected instream flow rights. The Oregon Health Authority has told auditors the agency would need more funding to regulate and help small water systems, and more resources and assistance to smaller communities.

The 100-Year Water Vision recognized the need for a more strategic approach at the regional level to guide water investment decisions. Developing a more robust investment strategy would require extending beyond the substance and structure supporting the development of the IWRS, to determine and incorporate regional needs. Key water stakeholders told auditors that their perception was

decisions made by the Legislature in the 2021 session were not strategic or prioritized. They were concerned these decisions may have been skewed by individual relationships or agendas.

Natural infrastructure is the strategic use of natural lands, such as forests and wetlands, and working lands, such as farms and ranches, to meet infrastructure needs. As the 100-Year Water Vision recognized, natural infrastructure is under-utilized and is critical to incorporate into the state's water funding and management strategy. Oregon would benefit from more widespread adoption of natural infrastructure, which can cost less than built infrastructure, and provide multi-benefit solutions, supporting social, economic, and hydrological efficiency gains for communities.

In 2021, Willamette Partnership and the Oregon Environmental Council partnered to publish a report proposing a number of specific actions for the state's consideration around prioritization, funding, policy, and requirements for natural infrastructure. For example, state agencies should explicitly prioritize natural infrastructure, and require consideration of natural infrastructure alternatives as part of permit or funding applications.

Adopting a more strategic approach would allow for an equitable distribution of funds. It would also support transparency and legitimacy in legislative investment decisions and help ensure funds are invested in the areas of the state with the highest need. The urgency for developing such an approach is heightened as the state attempts to administer additional federal funding equitably. The federal government encourages states to use the influx as a catalyst for strengthening their project pipelines, building capacity for small and disadvantaged systems, encouraging integrated and regional approaches, and performing additional outreach on new funding opportunities.

Some other states have dedicated funding mechanisms to support plan implementation, such as a Texas fund created by the state legislature to provide affordable, ongoing state financial assistance for projects in the Texas water plan tied to regional planning. Through fiscal year 2021, the fund has committed approximately \$9.2 billion for projects across Texas.

Several recent reports and key stakeholders have also discussed ways Oregon state leadership could better leverage existing federal infrastructure dollars, increase efficiency and effectiveness in the state's water spending, and improve equity in the state's access and funding process.³³ For example, a nonprofit technical assistance provider presented options to the Legislature in 2021 on ways the state could re-structure its process to reduce the burden from communities in applying for federal funding. Another nonprofit research group has recommended that state governments create funding to assist local governments with meeting federal match requirements. While agencies are taking steps to try addressing these challenges independently, having an actionable water plan tied to a water funding strategy would allow for more coordinated headway.

³³ Relevant reports: [Natural Infrastructure in Oregon, Common Challenges, Opportunities for Action, and Case Studies](#). Willamette Partnership and Oregon Environmental Council. 2021; and [Water Investment Ready Oregon, Accessing Federal Water Funding](#). Willamette Partnership. 2021: Willamette Partnership.

Local Perspectives: Lower Umatilla Basin

In summer 2022, the Audits Division spoke with five Morrow County and City of Boardman community members with the assistance of Oregon Rural Action (ORA), a community-led organization based in Eastern Oregon. Nineteen community members also provided written statements with the assistance of ORA detailing their personal experiences and concerns with nitrate impacted groundwater. Most of their domestic wells that have recently tested above federal safe drinking water standards for nitrates.

ORA provided the following overview of the problem.

1. Community members whose wells have recently tested high for nitrates in the Lower Umatilla Basin were unaware they may have been exposed for decades to toxic drinking water and had little to no information to protect themselves and their families.
2. Community members identified health concerns related to exposure to nitrates.
3. Community members need access to safe drinking water for basic uses including drinking, cooking, and oral hygiene.
4. The scope and severity of the water insecurity problem in the Lower Umatilla Basin is unknown including the universe of domestic drinking water wells in the region, the number of wells and households impacted, and the efforts required to secure immediate and long-term access to safe drinking water in the region.



Rural Boardman neighborhood meeting and Morrow County's first emergency bottled water delivery, June 2022 | Source: Oregon Rural Action

Though the region’s public water systems are regulated to meet federal safe drinking water standards, poor groundwater quality is an urgent concern to the portion of the population that relies on private or small community wells to provide water for domestic uses. The Lower Umatilla Basin, which includes parts of Umatilla and Morrow counties, is home to a large, growing, and diverse community of agricultural workers. Compared to the state as a whole, the demographics of Morrow and Umatilla Counties are more ethnically diverse with a higher representation of people who identify as Hispanic or Latino and a higher poverty rate. These communities have long lived in the area and work in agriculture - the region’s economic engine and a primary source of the nitrate pollution. Access to information in culturally relevant languages and platforms is a barrier to addressing water insecurity.

Communities in the region have experienced groundwater degradation for decades. In 1990, the state established the Lower Umatilla Basin Groundwater Management Area (LUBGWMA) due to high concentrations of nitrates in the groundwater. The LUBGWMA committee is comprised mostly of representatives from cities, districts, and industry in the region. Two voluntary LUBGWMA action plans, released in 1997 and 2020, have failed to meet the state-required goal of less than 7 mg/L of nitrates (the EPA limit is 10 mg/L).

Community members shared they were largely unaware of the nitrate concerns with their groundwater until spring 2022. At that time, Morrow County partnered with ORA to begin testing domestic drinking wells, reporting the results back to communities, and providing factsheets on nitrates in English and Spanish. In June 2022 Morrow County declared an emergency based on the testing results and began free water distribution. As of September 2022, ORA and Morrow County had tested 485 household wells, with more than 200 wells testing above federal safe drinking water limits for nitrates. Well testing has since expanded to Umatilla County.

In 2020, the EPA encouraged the Oregon Health Authority, Department of Environmental Quality, and Oregon Department of Agriculture to develop and implement a workplan to protect residents from nitrate-contaminated water following a petition to take emergency action. The EPA requested a more detailed plan in 2022, clarifying that the plan must include “an adequate response plan to address the immediate health risks” in the Lower Umatilla Basin. Since then, roughly \$882,000 has been allocated to the Oregon Health Authority by the state’s Emergency Board to address health risks caused by excessive nitrate levels in domestic wells. A detailed plan is not yet available.

According to ORA, their organization and local community members urgently support implementing a workplan that addresses immediate community needs for safe water and the following minimum components outlined by the EPA: a coordinated plan among state and local governments and private entities; a hazard assessment identifying each impacted resident; public education and outreach; water testing at no cost; the provision of alternative water needed for drinking, cooking, oral hygiene and dishwashing through reverse osmosis filter systems and maintenance at no cost, water delivery or connecting to a public water system; and public records so the public can understand the scope and severity of the nitrate contamination in the Lower Umatilla Basin and measure Oregon’s progress in implementing a response plan.

Statements from community members

Community members shared a wide array of concerns about nitrate-contaminated groundwater and how it has impacted their families. Many knew the water in the area was not safe for drinking but had

not been heard or been provided with more specific information on the dangers of nitrates to community health. Most were using their well water for cooking and other domestic needs. Many people shared concerns about health problems such as cancer. They had difficulty finding information about wells and filtration systems, particularly in Spanish, but still took initiative to purchase and install filtration systems to improve their household water. Even so, many still saw their water test above federal safe drinking water levels.



Community members meet in Boardman to call for safe drinking water, September 2022. | Source: Oregon Rural Action

The following statements are printed verbatim to allow residents the opportunity to speak for themselves on urgent issues of water security.³⁴

A. Lopez

“I have had my property in Boardman for the last 18 years. I have my own well here in the house that we live in. I share my testimony in hope that it will help me and my community to receive the necessary resources to ensure that we are a safe rural water community.

The first time I noticed there was something wrong with the water quality was when we had to clean the water heater from all the corrosion buildup from the water. My mother has had her

³⁴ See Appendices C and D for full written statements from community members and Oregon Rural Action.

house for about 8 years now and every 3 to 4 months I help her clean the water heater... We have had to replace all the tubing in the house which was a pricey process.

About 2 years ago, I built a home on the property... However, before I was able to get a loan for the house, I had to install a pricey filtration system that was around \$5000... I recently tested my water, and the nitrates were almost 4 times the contaminant level (39.4ppm). I quickly learned that to have an effective filtration system, I have to change the filters out every 4 months. It costs me about \$280 each time I change the filters, so that totals to more than \$1120 of unnecessary expense if I only had clean water out my well.”

M. Martinez

“I have been living in Boardman for the past 36 years...Unfortunately, last year I had two miscarriages. Now, hindsight, I wonder if the nitrates in the water caused me to have this problem because I used to drink the water and even cooked with the water since living here...No one had ever warned me about the danger that existed...Maybe if I knew the information, if I had had this information before, I wouldn't have done it... My well tested at 26.”

M. Colin

“My parents have a long history of working in agriculture and harvesting in these areas since they arrived in the 1980s...I can't say for sure if I suffer or if my family suffers from any symptoms related to the effects of high levels of water nitrates. But what I can say with certainty is that we felt fear and concern when we received the news... Now I have to say (to my children), don't drink that water because it hurts you....My parents and neighbors have spent a lot of money on bottled water weekly,... installed expensive water filters that only worked a few years, this being the reason our water test resulted in a 36.5....”

M. Brandt

“My name is M. Brandt and I have served in the Marine Corps. My wife and I have been residents of Morrow County for the last 25 years... In order to get my mortgage, I had to install a water filtration... It was a frustrating experience having to come up with an additional \$1,500 to get a system...I recently had my water tested and the nitrate levels are at 34.5, which are more than 3 times the contaminant level...”

C. Sanchez

“My name is C. Sanchez and I live here in the town of Boardman, I have been living here for more than 20 years outside of the city limits and in fact, this was the first year that I learned that this water is not good to drink...I have a four-year-old son and a son that's two months old...”

State leadership should provide clear support to state water agencies enacting regulations that protect water security for the public

Some of Oregon's agencies related to water have broad regulatory discretion but may be prevented from using that discretion for the benefit of the public by poorly written policies and external pressures. State regulation also supports local and regional planning, but agencies must first be allowed to enact those regulations. Ensuring agencies receive an appropriate level of support, particularly around resources, capacity, and clearly written policies, can help safeguard the integrity of the regulatory function.

One example is the ongoing and chronic overallocation of water in many areas of the state, a concern that began before the introduction of the Water Code. Regions like Harney County are confronting serious water shortage issues caused by overallocation and worsened by drought. Some rivers, streams, lakes, and aquifers have more water allocated from them than exists within them. Regardless of the sensibility of these allocation amounts, they are protected by the code. The state and many local players are engaged in ongoing discussions and agreements about how to share an increasingly scarce resource among right holders. However, when these discussions break down, the state has limited recourse to address the very serious water shortages that could result.

Another example is the lengthy regulatory and legal processes around both water quantity and quality that can prevent the state from acting swiftly when water users are out of compliance with existing rules (such as that illustrated on page 18 with the Klamath Tribes). The state prioritizes taking an educational approach to address compliance concerns, which can be effective and beneficial to small farms or organizations that need time to reach compliance. State laws are also set up to protect constitutional rights and due process of individuals that may be out of compliance. However, it can sometimes take the state years to enact a regulatory measure or issue a fine to an entity that cannot or will not comply with state regulations. Those actions can also be legally challenged. The fragmentation of agencies with similar and adjacent regulatory responsibilities may also lead to confusion on the ground when trying to report a compliance concern.

Water policy and policies that impact water encompass a vast field of laws, rules, and practices. To root out and address policies that may prevent the state from taking meaningful action on water security and equity, each agency may need to work with their individual board or commission to assess where there are gaps or barriers in policy, and how water security and equity can be more effectively carried out. It may also require legislative action in some cases.

Several stakeholders told the audit team external pressures put on some water agencies prevented them from effectively carrying out their regulatory duties, and some of the processes in place to ensure the public interest is considered in water decisions are not always being used. Water agencies may also be at risk of losing funding when they make decisions that run counter to the desires of powerful stakeholders. A robust state and regional framework built on shared priorities, and clear support from the Legislature and Governor's Office, can help regulatory water agencies carry out their most critical duties to the benefit of all Oregonians. These regulations, properly implemented, can help ensure Oregon has enough clean, safe, and accessible water to meet everyone's basic needs.

Federally recognized Tribes must be integrated as full and equal partners and co-managers in state water decision-making

Oregon's nine federally recognized Tribes are sovereign nations with which Oregon has government-to-government agreements in place. However, the Tribes have historically been left out of water planning and water rights decisions in Oregon. Of the three Tribes the audit team met with for this report, only the Klamath Tribes have fully adjudicated senior water rights, decided in court after several decades of persistent work and advocacy. Termination has also influenced the Tribes' ability to participate in decision-making around water. Concerns remain about lingering prejudices on the part of some regional players, and the ongoing exclusion of Tribes in certain regional decisions.

The Tribes' water security concerns are pressing and tied in with matters of sovereignty, Tribal cultural identity, and long-term survival. Oregon Tribes are historically and culturally dependent on regional lakes and rivers and the Pacific Marine environment, which provide anadromous First Foods central to Tribal cultures. Their access and ability to interact with those water bodies has been curtailed by federal and state actions including treaty and water right decisions and over a century of water, economic, agricultural, and energy policies that have often not included the Tribes, but which have impacted water quantity and quality and have greatly reduced Tribal water security.

The Tribes have expressed their desire and right to be more directly involved in water decisions that impact their communities. In 2021, all of Oregon's nine federally recognized Tribes sent a formal request to the Governor's Office to establish a Tribal water task force that would include the nine Tribes and the state's core water agencies. The purpose of the task force would be to educate both parties: the Tribes wanted to learn more about which state agencies intersected with water and how, and in turn wanted to educate those agencies on the full complement of Tribal water interests and issues needing acknowledgment. The Tribes, as the first inhabitants of the state, requested their voices be included in the state's 100-Year Water Vision to "ensure its comprehensive commitment to our collective human and ecosystem resiliency needs." The task force began meeting in June 2022. Coordination, co-management, restoration, education, and the integration of cultural values were some of the themes covered.

In a discussion with the State Supported Regional Water Management Workgroup in May 2022, Tribal representatives shared they honored water in their ceremonies and considered how to balance their needs and care for water as a precious source of life.

Several Oregon Tribes are involved in regional and statewide water management discussions. However, direct involvement in numerous state processes can often be difficult for some small Tribal governments with limited capacity. The state must include the Tribes in a more meaningful way around water planning and high-level decision-making for the state as a whole and for their regions specifically. Incorporating Tribes that want to be involved as key players in a regional structure could help to address some of the needs they have voiced to the state.

Tribes that never had federal recognition, or did not regain it after termination, have been largely disenfranchised from land and water stewardship. In the state of Oregon, these unrecognized tribes include the Chinook Nation and the Clatsop-Nehalem Confederated Tribes of Oregon. Both Tribes have attempted to gain federal recognition.

Including the Tribes more directly in state and regional water decisions as co-managers would allow state leaders and agencies to learn more about their practices and begin to incorporate them more broadly and where appropriate for local ecosystems. It would also provide greater opportunity for Tribes to influence state and regional decisions that affect their communities.

Tribal Termination and Restoration

In the 1950s and 1960s, the federal government ended its recognition of the sovereignty of over 100 Tribes with the stated intent of assimilating their peoples into mainstream American society. Several Oregon Tribes were subject to termination in the 1950s, including the Coquille, Cow Creek, Coos, Lower Umpqua, Siuslaw, Grand Ronde, Siletz, and Klamath. For tribes like Cow Creek, termination “declared there were no more Indians left in western Oregon.”

Termination had disastrous economic, environmental, cultural, and personal impacts on those targeted. Tribes like the Klamath lost their land almost overnight, in what they considered to be a bid to gain control over their remaining natural resources. Tribes lost federal support for health care and education programs, utilities, and other support services previously available to them on reservation lands. In all, about 2.5 million acres of land were taken by the federal government from Tribal holding nationwide. Termination also delayed Tribal access to full water rights and set back potential investments in water security measures.

Tribes petitioned and advocated for years to regain their recognized sovereign status, and several in Oregon succeeded. Some regained ownership of some of their historic lands after the restoration of federal recognition in the 1980s, though these tended to be small, noncontiguous parcels.

Tribes in Oregon seek to regain access and use of their ancestral lands and participate as leaders and equals in land and water stewardship efforts. Both recognized and non-recognized Tribes are actively buying back portions of their historic lands. For some, the goal is the full restoration of traditional, aboriginal lands to Tribal stewardship. Expanding upon their current land holdings would allow Tribes to more fully implement Tribal land and water management programs and practices.

Other states are beginning to include Tribes more directly in regional water and land management decisions. In 2020, California released a Statement of Administration Policy on Native American Ancestral Lands,³⁵ which encouraged California state entities to support Tribal co-management and access to natural lands within Tribal ancestral territory under the ownership or control of the state. Administration policy also encourages state entities to work cooperatively with California Tribes that seek to acquire natural lands “in excess of State needs.”

In September 2022, the Yurok Tribe entered into a Memorandum of Agreement with California State Parks to support the integration of Yurok Traditional Ecological knowledge into their natural resource management practices in the Yurok Tribe’s ancestral lands. Shortly after, five Tribes in the newly established Tribal Marine Stewards Network reached an agreement with the state of California to allow them to manage more than 200 miles of coastal lands. This will include monitoring salmon migrations, testing for toxins in shellfish, and providing cultural educational resources.

³⁵ Governor Newsom released the Statement of Administration Policy on Native American Ancestral Lands on September 25th, 2020. <https://www.gov.ca.gov/wp-content/uploads/2020/09/9.25.20-Native-Ancestral-Lands-Policy.pdf>

Tribal land and water management practices acknowledge the human relationship to ecosystems and our role in maintaining ecological health

There is a clear recognition among Oregon Tribes of the close linkages between the ecosystems in which they live, their cultural expressions and traditions, and their well-being as a people. The Tribes tend to view water, land, and ecosystem and human needs as integrated and interrelated; humans are not separate from a functioning ecosystem but are instead part of it. They also use traditional and ecologically appropriate water, land, and ecosystem management practices.

For example, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) developed a mission for their Department of Natural Resources to “protect, restore, and enhance the First Foods — water, salmon, deer, cous, and huckleberry — for the perpetual cultural, economic, and sovereign benefit of the CTUIR.” CTUIR proposed to accomplish this mission using “traditional ecological and cultural knowledge and science to inform... population and habitat management... natural resource policies and regulatory mechanisms” and subsequently created the Umatilla River Vision (2008) and Upland Vision (2019) to provide management guidance for water quality and habitat restoration in its areas of rights and interest.

The water vision introduced a framework that sought to “reflect the unique tribal values associated with natural resources and to emphasize ecological processes and services that are undervalued by westernized Euro-American natural resource strategies.” CTUIR has engaged in many water planning and management actions in alignment with their River Vision and values.



Tribally managed forest land (center) withstood the destruction of the Bootleg Fire. | Source: Klamath Tribe

These practices may also be more resilient in the face of climate change. For example, the Klamath Tribes use a combination of thinning and prescribed fire treatment on their forestland. When the Bootleg Fire swept through Klamath County in 2021, it burned over 400,000 acres of forestland, with minimal damage to Tribally managed forest.

According to the Sixth Oregon Climate Assessment, “...tribal adaptation to environmental and social change over millennia can enable unusually high resilience.” Tribal communities are responding to water insecurity and climate change with ceremony, political action, workforce development, environmental stewardship, and youth education and fellowship.



Bitterroot harvest in NE Oregon. | Source: CTUIR Upland Vision, 2019.

Though resilient, Tribal communities and culture are still distinctly at risk. State leadership has recently been more responsive to Tribal requests and concerns, but the Tribes do not consider the state’s water management work to focus enough on integrated ecosystem health and recovering fisheries. The decline of such species as salmon, lamprey eels, and suckerfish represents not only the impending loss of critical first foods, but signals many of Oregon’s ecosystems, and the cultures and communities they support, are under immediate and profound threat. This trend bears direct and devastating consequences for Tribes, neighboring communities, and ultimately for all the people of Oregon.

The state’s natural resource agencies also tend to be chronically underfunded and understaffed to meet the array of responsibilities that they have. This contributes to agencies managing water in a reactive way, primarily responding to complaints, and failing to manage water proactively for long-term human and ecosystem needs. The state must pursue a fundamental shift in water resource management over the long term to better protect water security.

Tribal leadership of the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians shared, “The State of Oregon has a responsibility to all the people of Oregon to protect water, the life blood of Mother Earth. The water in Tenmile Lake being polluted six months of the year is not acceptable. The State of Oregon is not a third world country.”³⁶

³⁶ See Appendices A and B for written statements on water security prepared by the Confederated Tribes of the Umatilla Indian Reservation and the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians.

Tribal Engagement in Local Water Solutions

Water is Life!

Oregon Tribes, as Oregon’s original stewards, are actively engaged in seeking out and implementing solutions to water and ecological problems that impact their communities and local ecosystems and seek to expand on their efforts. As stated by the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians: “We would like to be at the table and help make decisions as it relates to water allocation and permitting within our ancestral territory.”

The Klamath Tribes

- Enacting a fully developed a forest management plan for their former reservation lands now part of the Winema and Fremont National Forests
- Working with some local landowners to apply traditional land, timber, and water management practices, like slash burning and building beaver analog dams
- Setting up a Tribal fish farm to raise young suckerfish to be reintroduced to the lake when the time is right
- Lobbying the state and federal government to review and change policies and practices that are detrimental to the ecosystem

The Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians

- Envisioning the renaming of their waterways in local languages and considering Environmental Personhood³⁷
- Working closely with the Oregon Department of Environmental Quality and EPA to develop their own Tribal Water Quality Standards, which are currently out for public comment
- Acting as stewards to all lands, plants, animals, and waters in and out of their ceded lands

The Confederated Tribes of the Umatilla Indian Reservation

- Developing their own Water Code and water quality standards
- Developing the Umatilla River Vision and Uplands Vision that shares the Tribe’s goals for water and local ecosystems in the Umatilla basin and acknowledges the complex and integral nature of water resources and First Foods
- Participating in a variety of efforts around strategic planning, regulation, research, river restoration and management, budget and decision support for Oregon’s water agencies, water rights negotiations
- Committing to settling its Umatilla Basin water rights claims to the greater benefit of the Tribe and the region

³⁷ Environmental personhood is a legal concept that designates environmental entities the status of a legal person, with the same rights, protections, and privileges.

What Are Our Recommended Actions?

The Oregon Legislature, Governor's Office, and relevant state agencies must adopt holistic and integrated policies and practices in line with good water governance principles. Oregon should build on previous and ongoing efforts to develop a state and regional water planning framework.

By adhering more closely to good governance principles and developing a regional framework set up to support water security and address water quality, quantity and ecosystems needs, the state can craft an approach to water governance that will benefit current and future generations. These principles and actions can support statewide water security and help balance the state's water needs.

As part of this work, state leadership needs to accomplish the following:

1. Sustain legislative commitment and develop shared priorities to guide Oregon in making holistic and inclusive water decisions promoting water security.
2. Connect a regional planning system with an integrated state water plan to guide water decisions and policy development.
3. Convene a formal planning and coordination body to guide the statewide plan and provide consistent support for regional governance needs.
4. Define and clearly establish agency roles and responsibilities in state and regional water plan development and implementation.
5. Take steps to balance interests and address high-priority water security needs by increasing public engagement in state and regional water management decisions.
6. Enhance public awareness and understanding of the state's urgent water challenges.
7. Explore opportunities to prioritize water security and equity more clearly in state policy, such as enshrining the human right to water in law and other policy changes that could expand protections for community and ecosystem health.
8. Improve water data to help Oregon agencies and communities better understand statewide and regional water needs and support strategic decision-making.
9. Adopt a strategic approach to water funding and a consistent funding base to support desired outcomes.
10. Show clear support for state water agencies tasked with carrying out regulatory responsibilities.
11. Integrate federally recognized Tribes as full and equal partners and co-managers in water decision-making.



This report is intended to promote the best possible management of public resources.

Copies may be obtained from:

Oregon Audits Division
255 Capitol St NE, Suite 180
Salem OR 97310

(503) 986-2255

audits.sos@oregon.gov

sos.oregon.gov/audits



Secretary of State
Shemia Fagan



Audits Director
Kip Memmott



EXECUTIVE ORDER NO. 23-08

**DETERMINATION OF A STATE OF DROUGHT EMERGENCY IN
GRANT AND DESCHUTES COUNTIES.**

At the request of Grant County (by Resolution and Order 2023-08, dated February 15, 2023), and Deschutes County (by Resolution 2023-012, dated February 22, 2023) and based on the recommendations of the Drought Readiness Council and input from the Water Supply Availability Committee dated March 13, 2023, and pursuant to ORS 536.740, I find the low snowpack, low reservoir levels, and low streamflow, along with above-average temperatures and below-average precipitation, have caused or will cause natural and economic disaster conditions in Grant and Deschutes Counties.

Forecasted water supply conditions and precipitation levels are not expected to improve. Drought is likely to have a significant economic impact on the farm, ranch, vineyard, recreation, tourism and natural resources sectors, as well as an impact on drinking water, fish and wildlife, and important minimum flows for public instream uses and other natural resources dependent on adequate precipitation, stored water, and streamflow in these areas. Extreme conditions are expected to affect local growers and livestock, increase the potential for fire, shorten the growing season, and decrease water supplies.

Conditions continue to be monitored by the State's natural resource and public safety agencies, including the Oregon Water Resources Department, the Oregon Office of Emergency Management, the Oregon Office of the State Fire Marshal, and the Oregon Department of Forestry's Fire Protection Division.

Preparation and resiliency to drought are vital to the health and safety of persons, property, and the economic security of the citizens and businesses of these counties. I, therefore, declare that a severe, continuing drought emergency exists and is likely to continue to exist in Grant and Deschutes Counties.

NOW, THEREFORE, IT IS HEREBY DIRECTED AND ORDERED:

- I. The Oregon Department of Agriculture is directed to coordinate and provide assistance in seeking federal resources to mitigate drought conditions and assist in agricultural recovery in Grant and Deschutes Counties.





EXECUTIVE ORDER NO. 23-08
PAGE TWO

- II. The Oregon Water Resources Department and the Water Resources Commission are directed to coordinate and provide assistance to water users in Grant and Deschutes Counties as the Department and Commission determine necessary and appropriate in accordance with ORS 536.700 to 536.780.
- III. The Oregon Water Resources Department is directed to seek information from the Oregon Department of Fish and Wildlife to help understand the impacts of water availability on Oregon's fish and wildlife, as necessary and appropriate in accordance with ORS 536.700 to 536.780.
- IV. The Office of Emergency Management is directed to coordinate and assist as needed with assessment and mitigation activities to address current and projected conditions in Grant and Deschutes Counties.
- V. All other state agencies are directed to coordinate with the above agencies and provide appropriate state resources as needed to assist affected political subdivisions and water users in Grant and Deschutes Counties.
- VI. This Executive Order expires on December 31, 2023.

Done at Salem, Oregon, this 23rd day of March, 2023.



Tina Kotek
GOVERNOR

ATTEST:

Shemia Fagan
SECRETARY OF STATE



Prepared in cooperation with the Oregon Water Resources Department

Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon



Scientific Investigations Report 2013–5092

Cover:

Upper Left: Irrigation diversion dam on the Deschutes River in Bend, Oregon, May 2002.

Upper Right: Groundwater-fed wetland between Cultus Lake and Crane Prairie Reservoir, August 2012.

Lower Left: Headwater spring feeding Fall River, Oregon, May 2002.

Lower right: Strata of the Deschutes Formation and overlying lavas exposed along the Crooked River, May 2002.

All photographs taken by Marshall Gannett, U.S. Geological Survey.

Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon

By Marshall W. Gannett and Kenneth E. Lite, Jr.

Prepared in cooperation with the Oregon Water Resources Department

Scientific Investigations Report 2013–5092

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
SALLY JEWELL, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

U.S. Geological Survey, Reston, Virginia: 2013

For more information on the USGS—the Federal source for science about the Earth, its natural and living resources, natural hazards, and the environment, visit <http://www.usgs.gov> or call 1–888–ASK–USGS.

For an overview of USGS information products, including maps, imagery, and publications, visit <http://www.usgs.gov/pubprod>

To order this and other USGS information products, visit <http://store.usgs.gov>

Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Although this information product, for the most part, is in the public domain, it also may contain copyrighted materials as noted in the text. Permission to reproduce copyrighted items must be secured from the copyright owner.

Suggested citation:

Gannett, M.W., and Lite, K.E., Jr., 2013, Analysis of 1997–2008 groundwater level changes in the upper Deschutes Basin, Central Oregon: U.S. Geological Survey Scientific Investigations Report 2013-5092, 34 p., <http://pubs.usgs.gov/sir/2013/5092>.

Contents

Abstract.....	1
Introduction.....	2
Study Area and Previous Work	2
Post-1997 Water-Level Trends.....	2
Purpose and Scope	5
Methods.....	5
Documenting Water-Level Changes.....	6
Modification of Model Input Files	6
Groundwater Flow Simulation Analysis.....	7
Changes in Hydrologic Conditions.....	7
Groundwater-Level Changes	7
Changes in Groundwater Recharge from Precipitation.....	13
Decreases in Recharge from Lining and Piping Irrigation Canals	13
Decreases in Recharge from On-Farm Losses.....	13
Increases in Pumping.....	15
Simulation of 1997–2008 Groundwater Conditions.....	19
Relative Effects of Climate, Pumping, and Canal Lining.....	19
La Pine Subbasin and Cascade Range	21
Sisters Area	23
Lower Bridge Area.....	23
Cline Buttes to Redmond Area	26
Redmond to Powell Butte Area	26
Spatial Distribution of Pumping and Canal-Lining Influences.....	28
Summary	33
Acknowledgments.....	34
References Cited.....	34

Figures

1. Map showing major geographic and cultural features of upper Deschutes Basin, central Oregon	3
2. Hydrographs of selected observation wells in the upper Deschutes Basin, central Oregon, contrasting water-level trends in and near the Cascade Range with trends in the basin interior.....	4
3. Graph showing annual mean discharge of Fall River in the upper Deschutes Basin, central Oregon (USGS gage 14057500); annual (water-year) precipitation at Crater Lake, Oregon; and cumulative departure from average precipitation at Crater Lake	5
4. Map showing locations of selected observation wells in the upper Deschutes Basin, central Oregon	8
5. Maps showing changes in measured springtime high-water levels in selected observation wells in the upper Deschutes Basin, central Oregon	9

Figures—Continued

6.	Graph showing water-level measurements in observation well 21S/11E-19CCC in the La Pine subbasin, central Oregon, showing seasonal variations as well as the effects of decadal climate fluctuations	12
7.	Graph showing water-level measurements in observation well 15S/13E-18ADD1 near Redmond, Oregon, showing continuous water-level declines since the early 1990s	12
8.	Graph showing water-level measurements in observation well 14S/12E-02CCC near Lower Bridge, northeast of Sisters, Oregon, showing continuous water-level declines since the early 1990s.....	12
9.	Graph showing estimated total annual groundwater recharge in the upper Deschutes Basin, central Oregon, 1978–2008.....	13
10.	Map showing spatial distribution and magnitude of estimated decreases in annual canal leakage due to lining or piping of irrigation canals between 1994 and 2008 in the upper Deschutes Basin, central Oregon.....	14
11.	Graph showing estimated annual groundwater pumping for irrigation in the upper Deschutes Basin, central Oregon, 1978–2008.....	15
12.	Graph showing estimated annual public-supply pumping in the upper Deschutes Basin, central Oregon, 1978–2008.....	15
13.	Maps showing distribution of groundwater pumping in the upper Deschutes Basin, central Oregon	16
14.	Graphs showing measured streamflow and simulated groundwater discharge to Fall River (USGS gage 14057500) and Odell Creek (USGS gage 14055600), upper Deschutes Basin, central Oregon.....	20
15.	Graph showing simulated and measured head elevation in observation well 15S/13E-18ADD1 near Redmond, Oregon	20
16.	Graph showing simulated head elevations in observation well 21S/11E-19CCC, a 100-foot deep well in the La Pine subbasin, central Oregon.....	21
17.	Graph showing simulated head elevations in observation well 22S/10E-10DDD01, a 1,458-foot deep well near La Pine, central Oregon.....	22
18.	Graph showing simulated head elevations in observation well 13S/09E-03AAC02 near Camp Sherman, Oregon	22
19.	Graph showing simulated head elevations in observation well 14S/09E-08ABA south of Black Butte, Oregon.....	23
20.	Graph showing simulated head elevations in well 15S/10E-08ACD near Sisters, Oregon	24
21.	Graph showing simulated head elevations in well 15S/10E-02CDA east of Sisters, Oregon	24
22.	Graph showing simulated head elevations in well 14S/11E-01DDD1 near Lower Bridge, upper Deschutes Basin, central Oregon	25
23.	Graph showing simulated head elevations in well 14S/12E-02CCC near Lower Bridge, upper Deschutes Basin, central Oregon	25
24.	Graph showing simulated head elevations in well 15S/13E-18ADD1 near Redmond, Oregon	26

Figures—Continued

25. Graph showing simulated head elevations in well 15S/12E-14CDD west of Redmond, Oregon27
26. Graph showing simulated head elevations in well 15S/13E-21ADB1 near Redmond, Oregon27
27. Map showing increases in groundwater pumping since 1994 and simulated groundwater-level declines resulting only from post-1994 increases pumping in the upper Deschutes Basin, Oregon as of 200829
28. Map of the upper Deschutes Basin, Oregon, showing estimated decreases in annual canal leakage due to canal lining between 1994 and 2008, and simulated groundwater-level declines resulting from decreased canal leakage31

Conversion Factors, Datums, and Location System

Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
Length		
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Area		
acre	4,047	square meter (m ²)
acre	0.4047	square hectometer (hm ²)
square mile (mi ²)	259.0	hectare (ha)
square mile (mi ²)	2.590	square kilometer (km ²)
Volume		
cubic foot (ft ³)	28.32	cubic decimeter (dm ³)
cubic foot (ft ³)	0.02832	cubic meter (m ³)
acre-foot (acre-ft)	1,233	cubic meter (m ³)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm ³)
Flow rate		
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year (m ³ /yr)
acre-foot per year (acre-ft/yr)	0.001233	cubic hectometer per year (hm ³ /yr)
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$^{\circ}\text{F}=(1.8\times^{\circ}\text{C})+32$$

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

$$^{\circ}\text{C}=(^{\circ}\text{F}-32)/1.8$$

Conversion Factors, Datums, and Location System

Datums

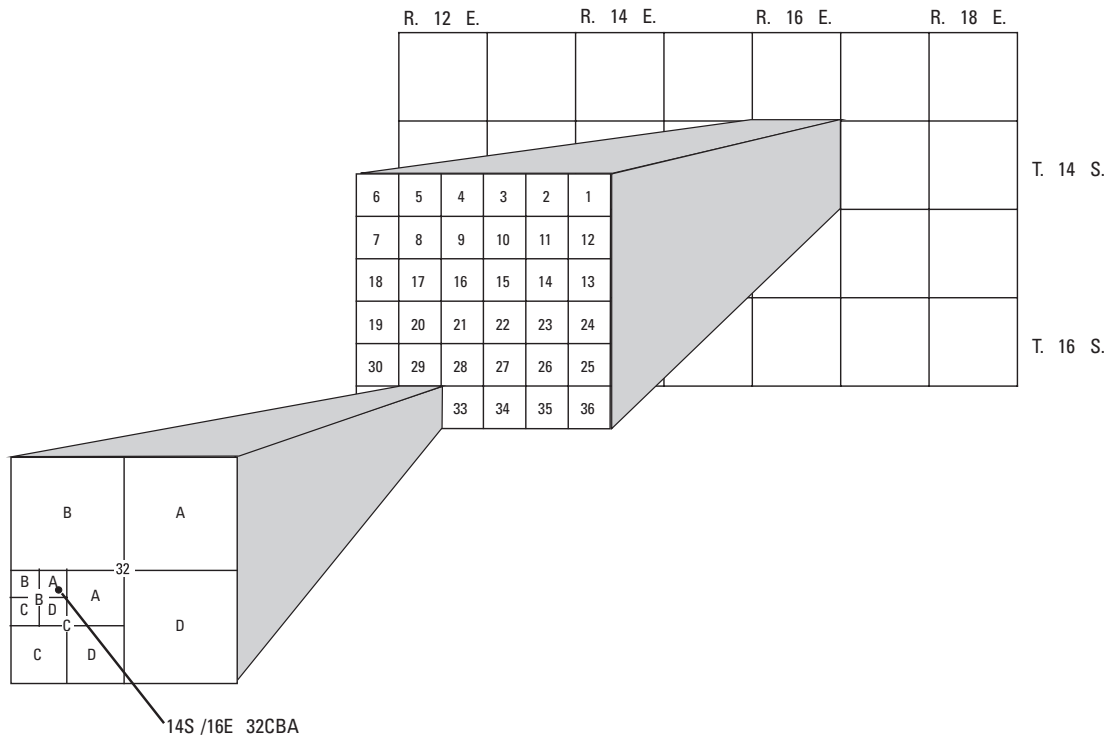
Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Elevation, as used in this report, refers to distance above the vertical datum (NGVD 29).

Location System

The system used for locating wells, springs, and surface-water sites in this report is based on the rectangular system for subdivision of public land. The State of Oregon is divided into townships of 36 square miles numbered according to their location relative to the east-west Willamette baseline and a north-south Willamette meridian. The position of a township is given by its north-south "Township" position relative to the baseline and its east-west "Range" position relative to the meridian. Each township is divided into 36 one-square-mile (640-acre) sections numbered from 1 to 36. For example, a well designated as 14S/16E-32CBA is located in Township 14 south, Range 16 east, section 32. The letters following the section number correspond to the location within the section; the first letter (C) identifies the quarter section (160 acres); the second letter (B) identifies the quarter-quarter section (40 acres); and the third letter (A) identifies the quarter-quarter-quarter section (10 acres). Therefore, well 32CBA is located in the NE quarter of the NW quarter of the SW quarter of section 32. When more than one designated well occurs in the quarter-quarter-quarter section, a serial number is appended.



Well-numbering system

Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon

By Marshall W. Gannett and Kenneth E. Lite, Jr.

Abstract

Groundwater-level monitoring in the upper Deschutes Basin of central Oregon from 1997 to 2008 shows water-level declines in some places that are larger than might be expected from climate variations alone, raising questions regarding the influence of groundwater pumping, canal lining (which decreases recharge), and other human influences. Between the mid-1990s and mid-2000s, water levels in the central part of the basin near Redmond steadily declined as much as 14 feet. Water levels in the Cascade Range, in contrast, rose more than 20 feet from the mid-1990s to about 2000, and then declined into the mid-2000s, with little or no net change.

An existing U.S. Geological Survey regional groundwater-flow model was used to gain insights into groundwater-level changes from 1997 to 2008, and to determine the relative influence of climate, groundwater pumping, and irrigation canal lining on observed water-level trends. To utilize the model, input datasets had to be extended to include post-1997 changes in groundwater pumping, changes in recharge from precipitation, irrigation canal leakage, and deep percolation of applied irrigation water (also known as on-farm loss). Mean annual groundwater recharge from precipitation during the 1999–2008 period was 25 percent less than during the 1979–88 period because of drying climate conditions. This decrease in groundwater recharge is consistent with measured decreases in streamflow and discharge to springs. For example, the mean annual discharge of Fall River, which is a spring-fed stream, decreased 12 percent between the 1979–88 and 1999–2008 periods. Between the mid-1990s and late 2000s, groundwater pumping for public-supply and irrigation uses increased from about 32,500 to 52,000 acre-feet per year, partially because of population growth. Between 1997 and 2008, the rate of recharge from leaking irrigation canals decreased by about 58,000 acre-feet per year as a result of lining and piping of canals. Decreases in recharge from on-farm losses over the past decade were relatively small, approaching an estimated 1,000 acre-feet per year by the late 2000s. All these changes in the hydrologic budget contributed to declines in groundwater levels.

Groundwater flow model simulations indicate that climate variations have the largest influence on groundwater levels throughout the upper Deschutes Basin, and that impacts from pumping and canal lining also contribute but are largely restricted to the central part of the basin that extends north from near Benham Falls to Lower Bridge, and east from Sisters to the community of Powell Butte. Outside of this central area, the water-level response from changes in pumping and irrigation canal leakage cannot be discerned from the larger response to climate-driven changes in recharge. Within this central area, where measured water-level declines have generally ranged from about 5 to 14 feet since the mid-1990s, climate variations are still the dominant factor influencing groundwater levels, accounting for approximately 60–70 percent of the measured declines. Post-1994 increases in groundwater pumping account for about 20–30 percent of the measured declines in the central part of the basin, depending on location, and decreases in recharge due to canal lining account for about 10 percent of the measured declines. Decreases in recharge from on-farm losses were simulated, but the effects were negligible compared to climate influences, groundwater pumping, and the effects of canal lining and piping.

Observation well data and model simulation results indicate that water levels in the Cascade Range rose and declined tens of feet in response to wet and dry climate cycles over the past two decades. Water levels in the central part of the basin, in contrast, steadily declined during the same period, with the rate of decline lessening during wet periods. This difference is because the water-level response from recharge is damped as water moves (diffuses) from the principal recharge area in the Cascade Range to discharge points along the main stems of the Deschutes, Crooked, and Metolius Rivers in the central part of the basin. Water levels in the central part of the basin respond more to multi-decadal climate trends than shorter term changes.

Groundwater-flow simulations show that the effects from increased pumping and decreased irrigation canal leakage extend south into the Bend area. However, the only wells presently monitored in the Bend area are heavily influenced by the Deschutes River, which dampens any response of water levels to external stresses such as groundwater pumping, changes in canal leakage, or climate variations.

Introduction

Study Area and Previous Work

The upper Deschutes Basin study area spans the part of central Oregon extending eastward from the crest of the Cascade Range to the low-permeability volcanic uplands of the Blue Mountains province (fig. 1). The northern boundary corresponds primarily to the geologic contact between late Tertiary volcanic deposits of Cascade Range origin and older, less permeable, early Tertiary deposits of the John Day Formation. The study area's southern boundary corresponds to the boundary of the Deschutes River drainage. Interior parts of the basin are dominated by a broad volcanic plain punctuated by volcanic eruptive centers, the largest of which is Newberry Volcano. The region is dominated by late Tertiary to Quaternary volcanic deposits that are moderately to highly permeable. Most of the Cascade Range is at elevations greater than 5,000 ft, and major peaks exceed 10,000 ft. The Cascade Range intercepts much of the moisture in eastward-moving air masses from the Pacific Ocean. As a consequence, average precipitation exceeds 75 in/yr over most of the Cascade Range, but decreases to less than 12 in/yr in the central part of the basin.

The combination of high rates of precipitation and highly permeable bedrock results in a large amount of groundwater recharge in the Cascade Range. An estimated 50–70 percent of precipitation infiltrates to the groundwater system in the Cascade Range (Manga, 1997; Gannett and others, 2001). This recharge feeds a substantial regional aquifer system that extends from the Cascade Range to the older volcanic uplands east and north of the upper Deschutes Basin.

The upper Deschutes Basin is drained by the Deschutes River and its many tributaries. Streams in the upper Deschutes Basin are considered fully allocated and closed to additional appropriation. As a consequence, the regional aquifer system has been developed for agricultural and public water supplies. In addition, the vast majority of residents outside of cities depend on wells for domestic water supplies. Rapid growth of the upper Deschutes Basin in the past few decades has relied exclusively on the development of groundwater resources. Maintaining stable and reliable long-term groundwater supplies is critical to the region.

The U.S. Geological Survey conducted a regional groundwater characterization and modeling study in the upper Deschutes Basin in the mid-1990s in cooperation with the Oregon Water Resources Department (OWRD), local government agencies, and the Confederated Tribes of the Warm Springs Reservation (Gannett and others, 2001; Gannett and Lite, 2004). During that study, approximately 1,500 wells were field inventoried. Water levels were monitored in 89 of these wells from 1993 to 1997 (Caldwell and Truini, 1997). Additional water-level data for a subset of these wells were available from an earlier period of monitoring from 1978

to 1980. Analysis of data collected through 1997 indicated that water-level fluctuations were driven primarily by climate cycles. At that time, water-level declines related to groundwater pumping were not apparent in the data.

Post-1997 Water-Level Trends

Rapid population growth and the associated development of the groundwater resources in the upper Deschutes Basin has continued since the late 1990s. Water-level monitoring also has continued in a relatively small subset of wells. Water-level data collected since the late 1990s indicate a continued response to climate cycles in most wells, but many of the wells in the more developed central part of the upper Deschutes Basin appear to show declines larger than what might be expected from climate variations alone. For example, wells close to the Cascade Range and near Sisters in the western part of the upper Deschutes Basin (fig. 2, wells A and B) exhibited (1) drought-related water-level declines from the mid-1980s to about 1995, (2) water-level recovery in 1996 and 1997, (3) fairly stable water levels from 1997 to 2000, (4) another climate-driven decline from 2000 to 2006, and (5) another recovery between 2006 and 2008. The lowest water levels associated with the drought that occurred around 2005 were about the same as, or just slightly lower than, the lowest water levels associated with the previous drought in about 1995. In contrast, water levels around Redmond and the area to the east (fig. 2, wells C and D) showed no recovery since the drought in the mid-1990s, and water levels have been on a more or less steady decline ever since. As of 2008, water levels in wells near Redmond were about 10–14 ft lower than the lowest water levels associated with the previous drought.

There are a number of possible causes of the measured water-level declines in parts of the upper Deschutes Basin. Chief among possible causes are climate-related decreases in basin-wide groundwater recharge from precipitation, increased groundwater pumping, and decreases in local groundwater recharge as a result of lining and piping of irrigation canals. Flow data from groundwater-dominated streams indicate that the Cascade Range aquifers in the upper Deschutes Basin have been affected by a drying trend since the 1950s. This can be seen in the general decline in flow of spring-fed streams in undeveloped parts of the basin. For example, since the 1950s, the annual mean streamflow of Fall River has shown a steady decline superimposed over decadal wet and dry cycles (fig. 3). A general decrease in flow of groundwater-dominated stream systems emanating from the Cascade Range in the Klamath, Rogue, and Umpqua Basins over the past 50 years has been documented by Mayer and Naman (2011). Luce and Holden (2009) documented decreases in streamflow from the Santiam and Metolius Rivers as part of a larger analysis of streams in the Pacific Northwest. Some proportion of the groundwater-level declines in the central parts of the upper Deschutes Basin is the result of this long-term drying trend.

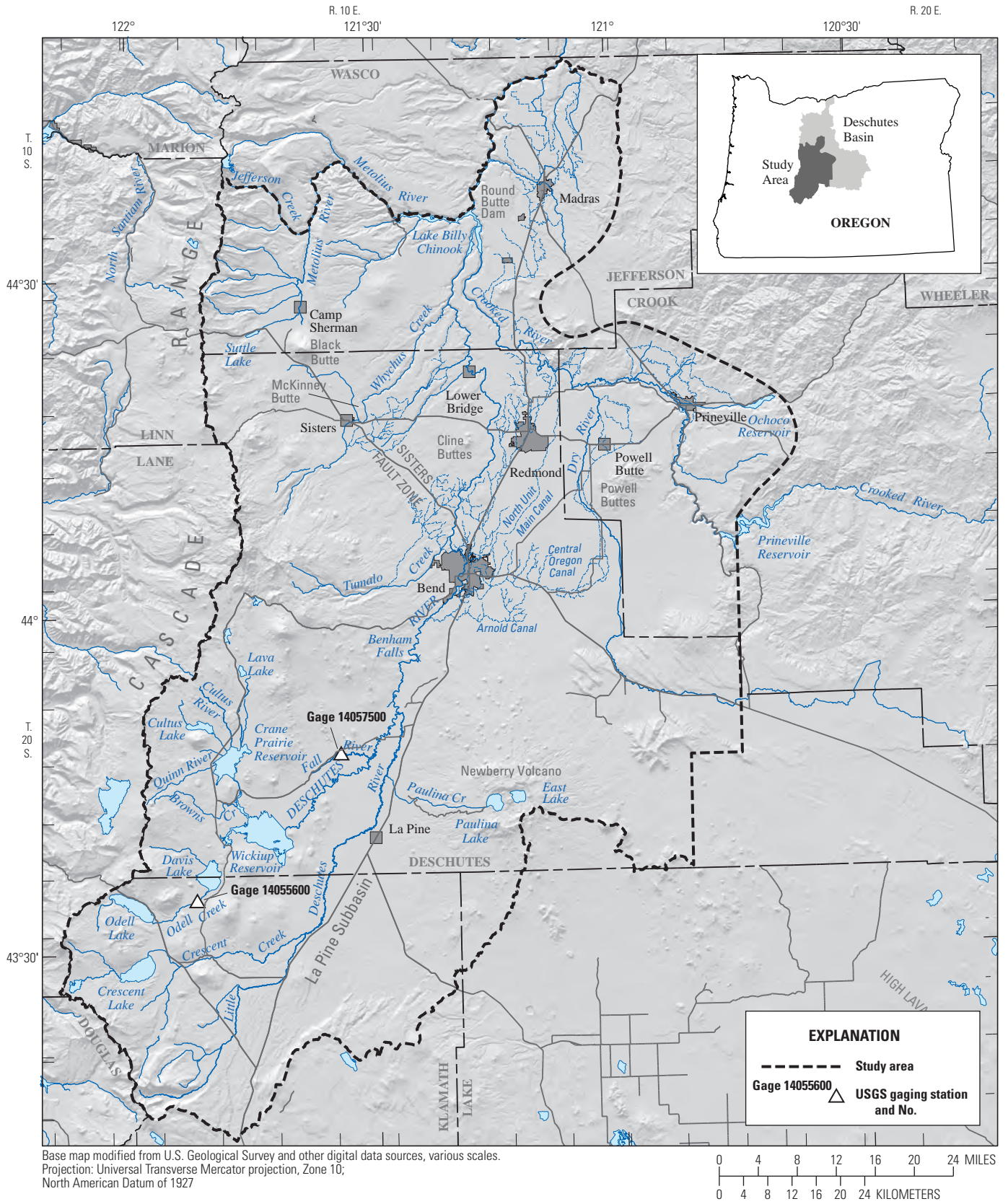


Figure 1. Major geographic and cultural features of upper Deschutes Basin, central Oregon.

4 Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon

There also are potential human influences on water-level changes in the basin including changes in pumping and irrigation-related activities. Groundwater pumping affects head-distribution in aquifers, and water-level declines are a normal consequence. Generally, if pumping rates do not exceed the aquifer’s ability to provide water, water levels will stabilize over time. Groundwater pumping has continued to increase in the basin since the mid-1990s, and the measured declines are at least partially coincident with known pumping centers.

Groundwater recharge from leaking irrigation canals elevated water levels in the central part of the upper Deschutes Basin over the past century. Previous studies (Sceva, 1968; Gannett and others, 2001) have shown that canal leakage is a significant component of the groundwater budget and also has resulted in increased baseflow to the lower Crooked River. Groundwater-level measurements from the early 1900s before installation of the canal network are virtually nonexistent, so it is not possible to know how much water levels have

risen in response to irrigation canal leakage. During the past two decades, there has been substantial lining and piping of irrigation canals for conservation purposes. The consequent decrease in recharge has resulted in declines in groundwater levels in some areas, particularly near the affected canals.

There also is a small amount of artificial groundwater recharge from deep percolation of applied irrigation water. These “on-farm” losses in the upper Deschutes Basin were estimated by Gannett and others (2001) to average about 49,000 acre-ft/yr (68 ft³/s) in the mid-1990s. From 2001 to 2009, on-farm losses decreased slightly because small amounts of acreage have been taken out of production and the water rights have been leased, so water may remain in streams. Part of the reason for doing this is to mitigate the impacts of new groundwater uses. Estimated decreases in groundwater recharge from on-farm losses were included in simulation work for this study, but their effects on groundwater levels are negligible.

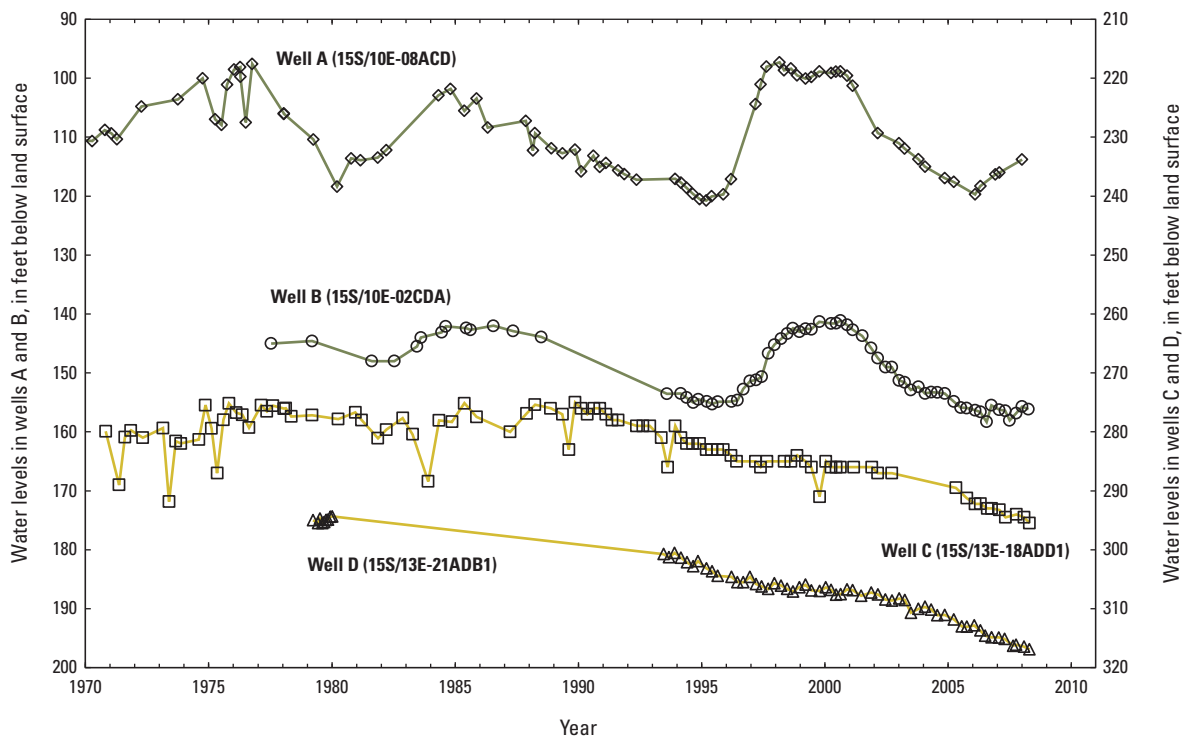


Figure 2. Selected observation wells in the upper Deschutes Basin, central Oregon, contrasting water-level trends in and near the Cascade Range (wells A and B) with trends in the basin interior (wells C and D). See [figure 4](#) for location of observation wells.

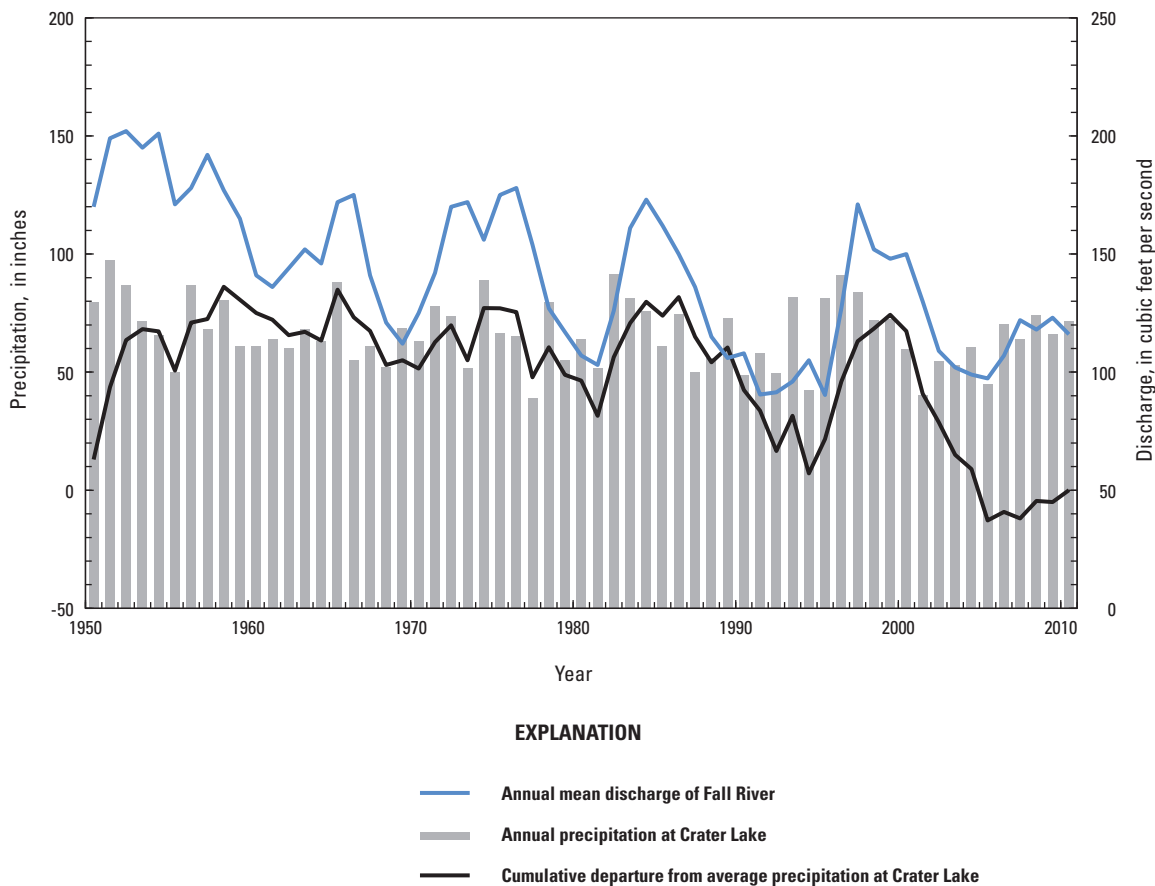


Figure 3. Annual mean discharge of Fall River in the upper Deschutes Basin, central Oregon (USGS gage 14057500); annual (water-year) precipitation at Crater Lake, Oregon; and cumulative departure from average precipitation at Crater Lake. Location of streamflow gaging station is shown in [figure 1](#).

Purpose and Scope

This study was designed to investigate the spatial distribution and causes of measured water-level declines in the upper Deschutes Basin. An important goal was to determine the relative influence of the major probable causes: (1) climate-driven decreases in groundwater recharge, (2) increased groundwater pumping, and (3) decreased artificial recharge as a result of lining and piping of irrigation canals. The study relied largely on historical data and data collected by OWRD between 1997 and 2008 (Oregon Water Resources Department, 2013). As part of the study, some wells measured until 1997 were revisited and measured. No new monitoring efforts have been started specifically as part of this study. The investigation used the groundwater model developed for the upper Deschutes Basin in the 1990s by Gannett and Lite (2004). Input data files were created to allow simulation of conditions up to 2008, but the model was otherwise unchanged.

Methods

This study used the existing USGS upper Deschutes Basin groundwater model (Gannett and Lite, 2004) to evaluate water-level changes between 1997 and 2008. This evaluation entailed compiling data on water-level changes as well as extending model input files to cover the time period of interest.

The upper Deschutes Basin groundwater model encompasses approximately 4,000 mi² with a grid composed of 127 rows, 87 columns, and 8 layers with variable cell dimensions. The model was developed using the USGS modular groundwater modeling code MODFLOW. Model boundary conditions include head-dependent flow to and from streams and head-dependent evapotranspiration. In addition, recharge, pumping, and boundary fluxes from adjacent basins are specified for each stress period. The model was originally calibrated to transient conditions from 1978 through 1997 (referred to as the “original” model period) using semiannual

stress periods. The model was not recalibrated for this study. The only changes were the extension of model input files for boundary stresses (recharge, pumping, and evapotranspiration) to cover the period from 1997 through 2008 (referred to as the extended model period). To make the model more compatible with newer stress packages, the model was converted from MODFLOW-96 to MODFLOW-2000.

Documenting Water-Level Changes

The extent and magnitude of water-level changes in the upper Deschutes Basin since 1997 was evaluated by compiling water-level data collected by OWRD between 1997 and 2008. In addition, selected wells that were monitored up to 1997 were revisited and measured. Hydrographs showing changes in water levels with time were updated, and changes in water levels over certain time intervals were plotted on maps. Data were insufficient to constrain the geographic extent of water-level changes, particularly those changes south of Redmond and near Bend. Consequently, it was not feasible to create contour maps showing water-level changes.

Modification of Model Input Files

The existing groundwater model of Gannett and Lite (2004) was used to evaluate the relative influence of factors contributing to water-level changes observed since the mid-1990s. The original model calibration and associated input files were for 1978 through 1997. For this study, model input files for recharge, groundwater pumping, and evapotranspiration were updated to include the period from 1997 through 2008.

Recharge from precipitation, which is affected by climate trends, was calculated for the original model and updated using a daily energy and moisture balance model known as the Deep Percolation Model (DPM) (Bauer and Vaccaro, 1987; Vaccaro, 2007). The DPM calculates recharge using climate observation data (temperature, precipitation, and solar radiation) from weather stations in the basin along with data describing various landscape characteristics. The DPM was used to estimate recharge for the original modeling period by Boyd (1996). To create recharge datasets through 2008, Boyd's recharge model was updated by extending the climate observation data. Other landscape factors were not changed.

Model input files describing the rate and distribution of groundwater pumping for the original model period were updated to cover the extended model period. Estimates of public-supply pumping in the original model were based on data from public water providers in the basin. Public-supply pumping data for the extended model period were obtained directly from water providers as well as water-use reporting records from OWRD. The largest public water suppliers during both the original and extended model periods include the cities of Bend and Redmond, and Avion Water Company.

Groundwater pumping for irrigation was estimated for the original model period (1978–97) using satellite imagery and water-rights mapping from 1994. Satellite images were used to identify crop types growing in areas mapped as irrigated with groundwater. Pumpage estimates were then developed based on water needs of the particular crop types and irrigation efficiency values. Pumping was distributed in the model using surveyed well locations and well log information. The 1994 base-period estimates were distributed to other years using water right priority dates.

Irrigation pumping volumes for the extended model period were developed using water rights data and well log information from OWRD. Consumptive use estimates were based on historical cropping patterns and crop data from the National Agricultural Statistics Service (2007).

Rates of recharge from canal leakage for the original model calibration period were estimated based on diversion and delivery data, seepage and ponding tests, and information on canal-bed geology and geometry (Gannett and others, 2001). Decreases in recharge from canal leakage that occurred during the extended model period were calculated based on a compilation of estimated decreases in canal leakage for pipe, lined, or abandoned canals provided by OWRD (Jonathan La Marche, written commun., 2009). The OWRD compilation included a geographic information system (GIS) map that showed the affected sections of canal, and the year that canal modification construction began and ended. For this study, decreases in canal leakage were assumed to commence the year canal modifications were completed. Decreases in canal leakage were provided for 225 separate canal or lateral reaches. These decreases in leakage were summed for each model grid cell for the appropriate years, and then subtracted from the leakage estimates used during the original model period.

Estimates of groundwater recharge from on-farm losses of irrigation water for the original model period were based on literature values coupled with knowledge of irrigation application methods in various areas (Gannett and others, 2001). On-farm loss refers to applied irrigation water that percolates beneath the rooting depth of plants that becomes groundwater recharge. On-farm losses were calculated as the difference between applied irrigation water (after factoring in irrigation efficiency) and consumptive use of the associated crops. On-farm losses were decreased in the extended model period based on annual (2001–08) estimates provided by OWRD of land area not irrigated to decrease surface-water diversions (Kyle Gorman, OWRD, written commun., 2009). In most cases, decreases in on-farm losses were distributed uniformly over the associated irrigation district because there was no readily available information about specific locations. Decreases in on-farm losses in Central Oregon Irrigation District area were focused around Redmond, per information from OWRD. Decreases in recharge from on-farm losses during the extended model period were calculated by dividing the non-irrigated acreage by the total district acreage, and decreasing the historical on-farm loss recharge by that proportion.

Groundwater Flow Simulation Analysis

To validate the ability of the model as originally calibrated to simulate conditions from 1997 to 2008, the model was run with all appropriate stresses updated (as described in section, “Modification of Model Input Files”) and simulated heads and flows were compared to measured equivalents during that period. The model fit to measured heads and flows during the extended model period was similar to the fit during the original model period, and the model was deemed suitable for examining conditions during the extended model period. To evaluate the relative contributions of climate variations, groundwater pumping, and piping and lining of irrigation canals to measured water-level changes, the model was run with all input files updated to 2008 (the base run), and then the model was run holding pumping and/or canal recharge rates at 1994 levels. We chose 1994 as the departure point for comparison because it was near the low point of the last drought cycle in the original model period. It is also the year where base estimates for pumping and canal leakage were determined for the original model period. The influence of individual stresses (climate variations, increased groundwater pumping, and decreased recharge due to canal lining) were evaluated by comparing simulation results of the base run with results from runs with individual stresses held at 1994 levels.

Changes in Hydrologic Conditions

Groundwater-Level Changes

Groundwater-level changes were evaluated using periodic (generally quarterly) measurements made by OWRD in approximately 25 wells from the mid-1990s through 2008. The locations of selected observation wells are shown in [figure 4](#). Water levels in five of the monitored wells are of no value in evaluating climate or pumping effects because they are influenced primarily by the stages of nearby streams or lakes that are artificially manipulated. Water levels in most of the remaining wells reflect varying influences of pumping and climate variations.

Water-level changes that occurred over three time periods (1996–2000, 2000–04, and 2004–08) throughout the upper Deschutes Basin are shown in [figure 5](#). The time periods approximately correspond to predominantly wet or dry periods. Water levels do not change uniformly over the entire basin ([fig. 5](#)), and different areas show different magnitudes and directions of water-level change each time period. The central part of the upper Deschutes Basin, specifically the area from Cline Buttes east to the community of Powell Butte,

experienced consistent water-level declines between 1996 and 2008. Well D in [figure 2](#) is an example of a well exhibiting a consistent water-level decline.

Wells in and adjacent to the Cascade Range showed water-level fluctuations generally following climate variations ([fig. 2](#), well A). Water levels generally rose during 1996–2000 in response to wet conditions, with many wells showing rises of more than 10 ft. During the dry period from 2000 through 2004, water levels in the Cascade Range declined by amounts similar to the earlier water-level rise. Between 2004 and 2008, water levels showed moderate rises in those wells that were closest to the Cascades and not influenced by pumping or stream stage.

Wells in the La Pine subbasin south of Bend also tend to respond to climate cycles, and show no evidence of discernible pumping-related trends due to distance from large pumping centers. During the three climate periods shown in [figure 5](#), shallow wells in the La Pine subbasin exhibited decadal patterns of fluctuation similar to those in the Cascades. Decadal climate fluctuations are relatively small and are of similar magnitude to seasonal variations ([fig. 6](#)). The more subdued fluctuations likely are a reflection of the low overall recharge rates in the area and distance from the Cascade Range.

Groundwater levels appear to have declined almost continuously in the area extending from Cline Buttes east to Powell Buttes, and from Cline Buttes north toward Lower Bridge. As shown by representative hydrographs ([figs. 7](#) and [8](#)), water-level trends in this area are characterized by subtle climate fluctuations superimposed on a dominant post-1990 downward trend. The climate influences are insufficient to overcome the downward trend, and the wet conditions in 1996 to 2000 that resulted in substantial water-level rises in wells to the west only resulted in a lessening of the decline rate in wells in this area.

Wells that have been monitored in the northernmost part of the upper Deschutes Basin, northeast of the Crooked River in Crook and Jefferson Counties, generally show moderate water-level fluctuations that tend to follow climate fluctuations. As recently as the late 1990s, water levels were still rising in some wells in Jefferson County, presumably in response to construction of Round Butte Dam and the creation of Lake Billy Chinook (Gannett and others, 2001).

The continuous water-level declines in parts of the upper Deschutes Basin may not solely be the result of pumping stresses. The declines are likely influenced by the general drying trend in the basin over the past several decades. It is possible that the effects of decadal wet and dry cycles are largely diffused and attenuated due to distance from the Cascade Range (the principal recharge area) and that the wells are responding to the longer term climate pattern.

8 Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon

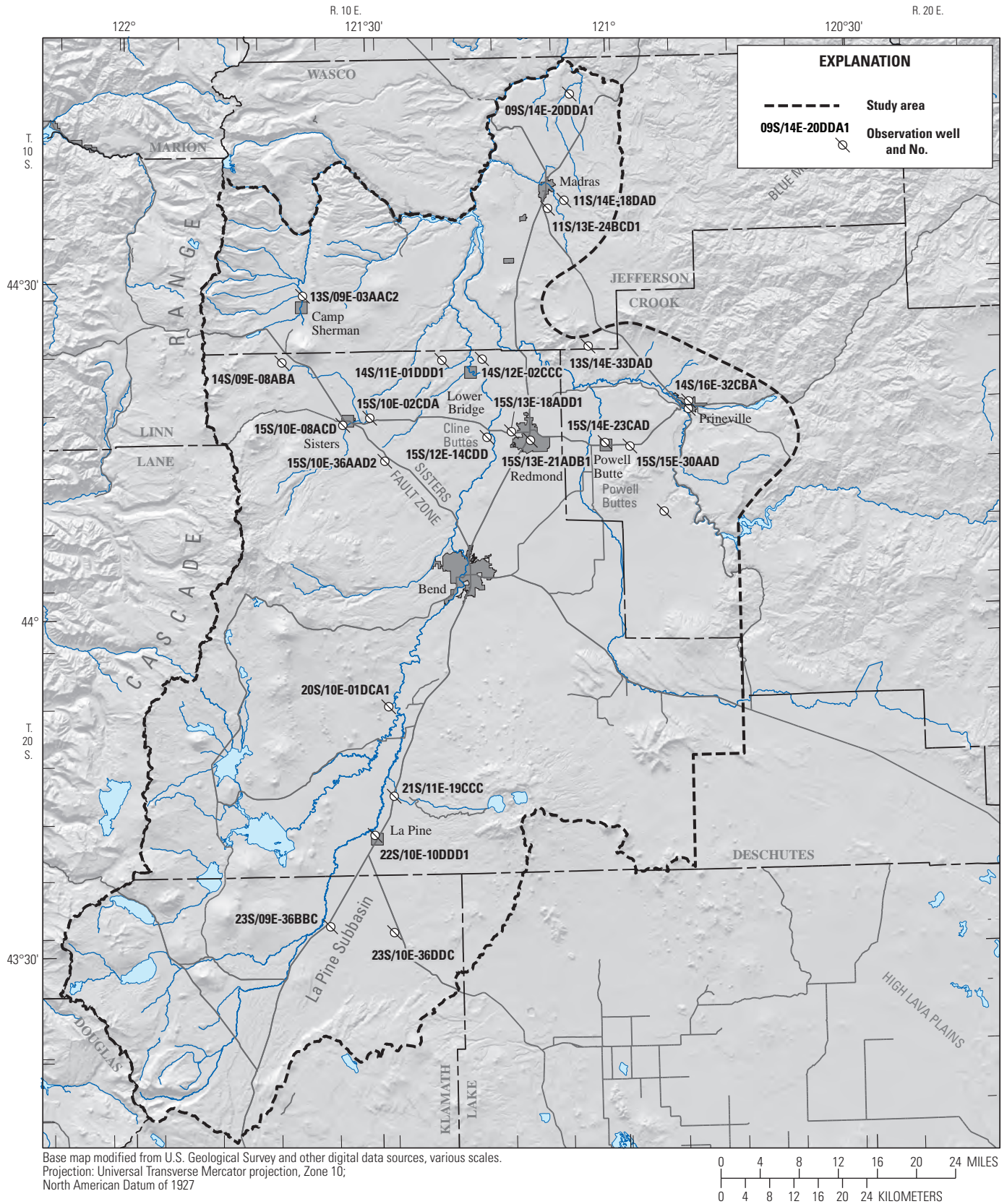


Figure 4. Locations of selected observation wells in the upper Deschutes Basin, central Oregon.

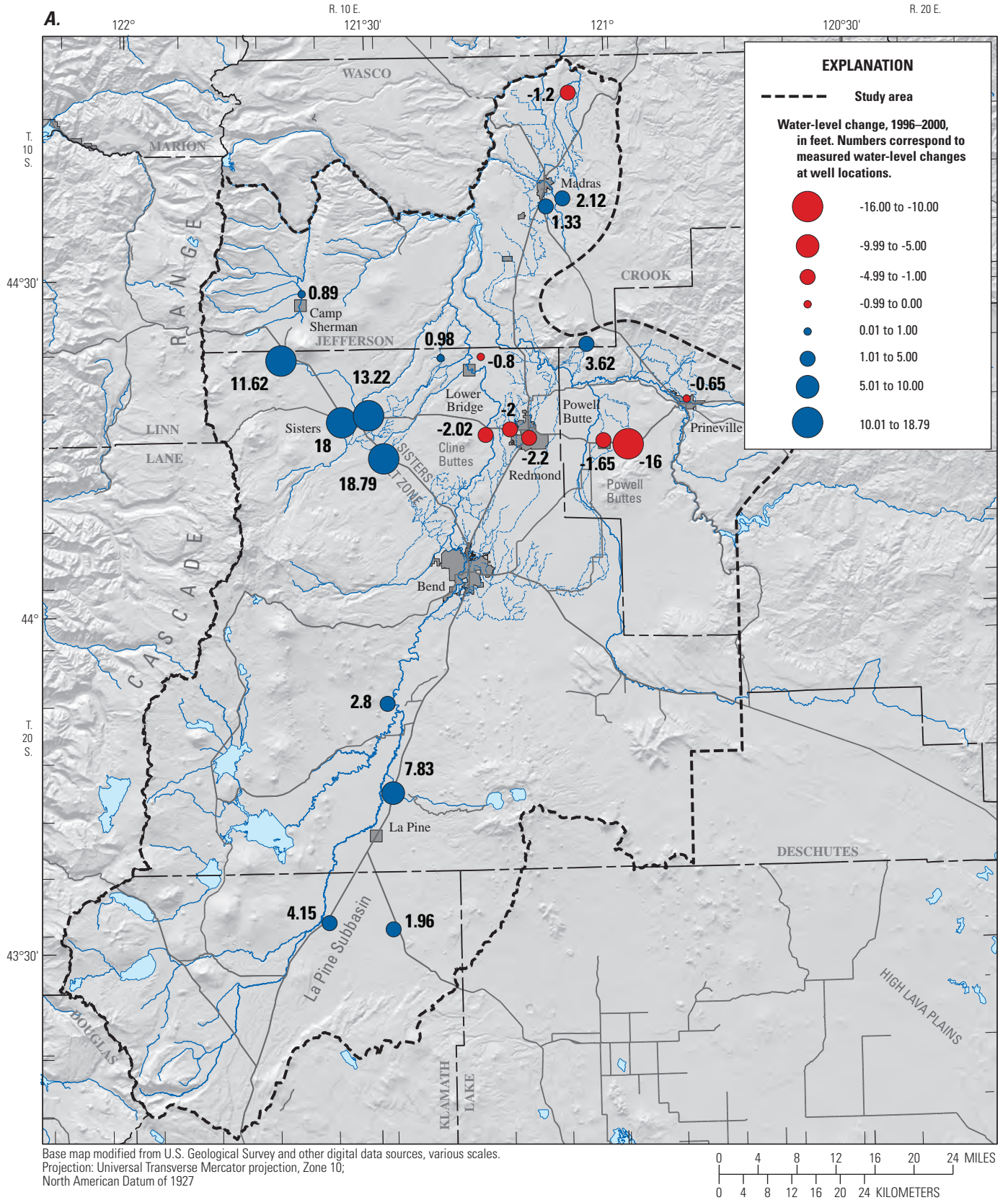


Figure 5. Changes in measured springtime high-water levels in selected observation wells in the upper Deschutes Basin, central Oregon. (A), 1996–2000; (B), 2000–04; (C), 2004–08.

10 Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon

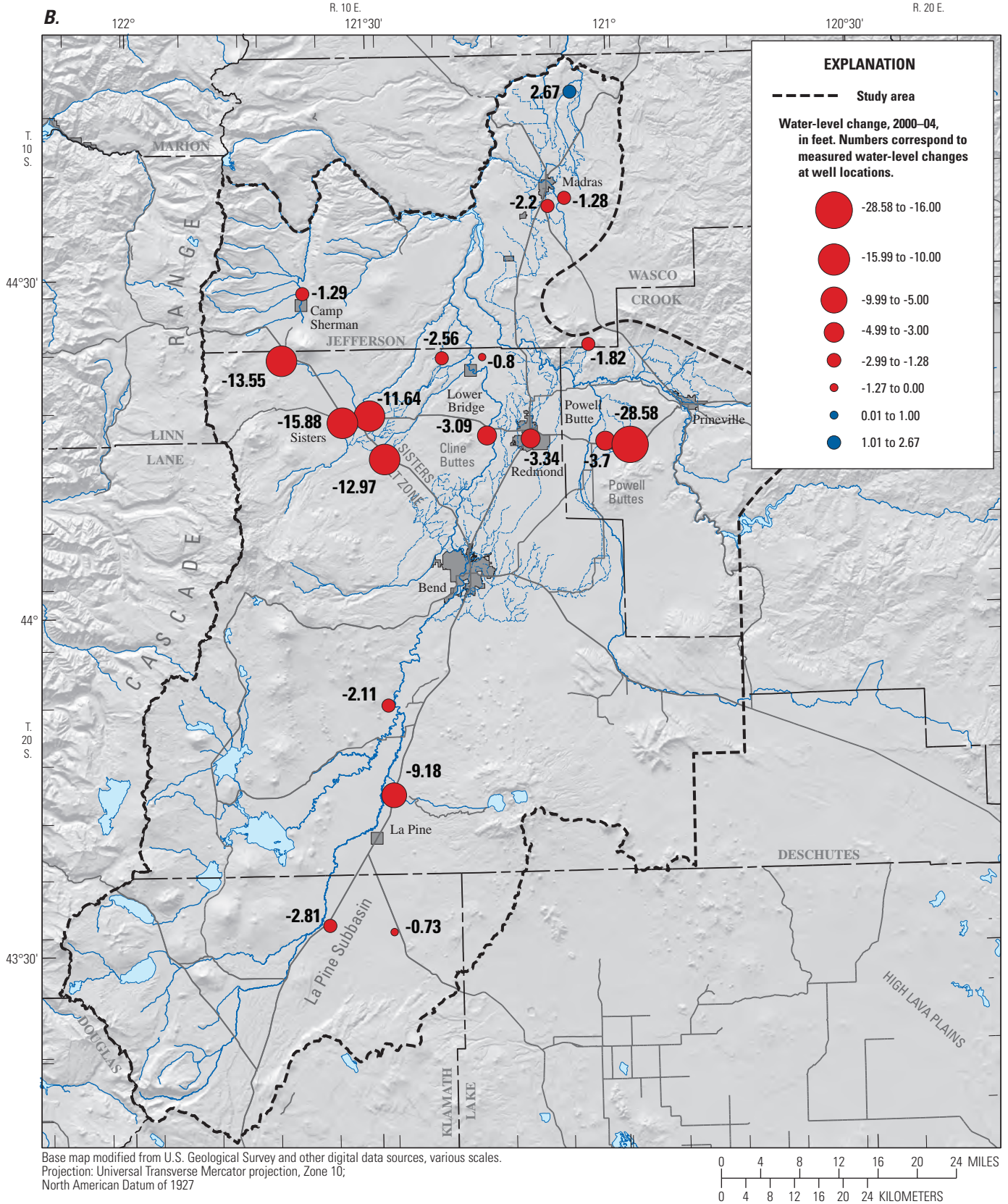


Figure 5.—Continued

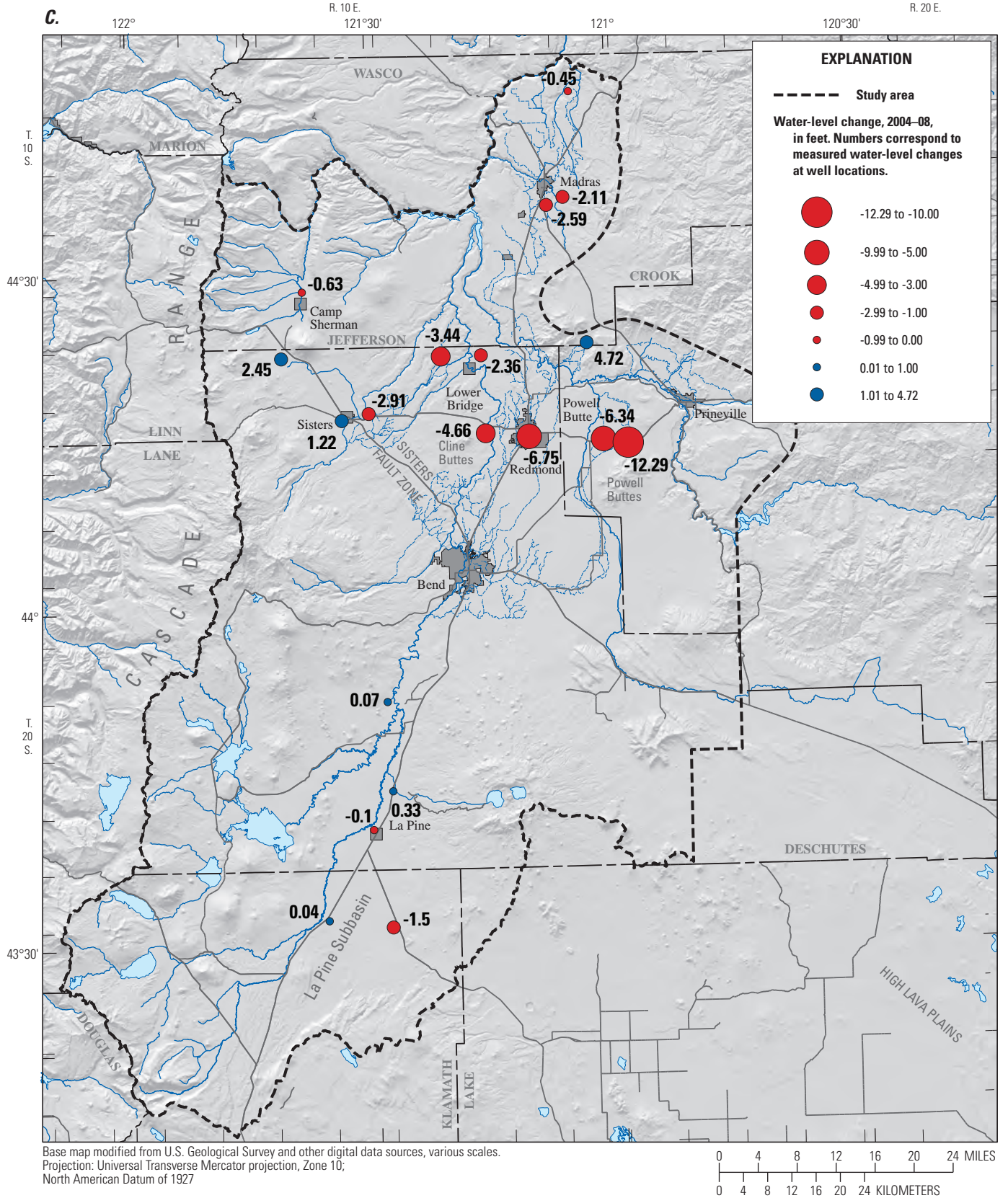


Figure 5.—Continued

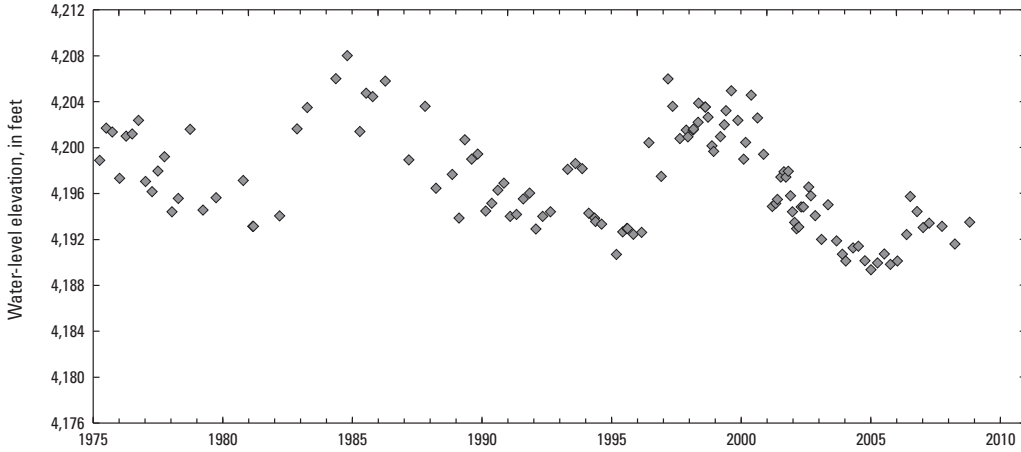


Figure 6. Water-level measurements in observation well 21S/11E-19CCC in the La Pine subbasin, central Oregon, showing seasonal variations as well as the effects of decadal climate fluctuations. Location of observation well is shown in [figure 4](#).

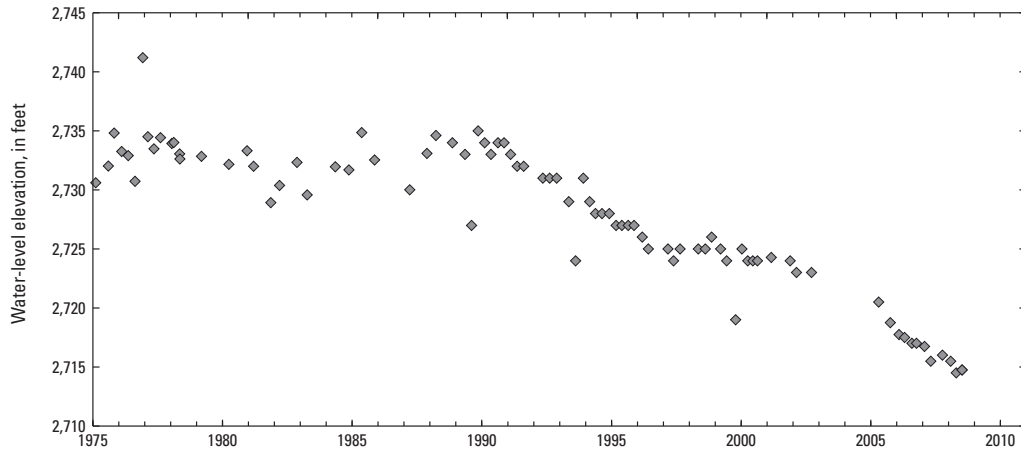


Figure 7. Water-level measurements in observation well 15S/13E-18ADD1 near Redmond, Oregon, showing continuous water-level declines since the early 1990s. Location of observation well is shown in [figure 4](#).

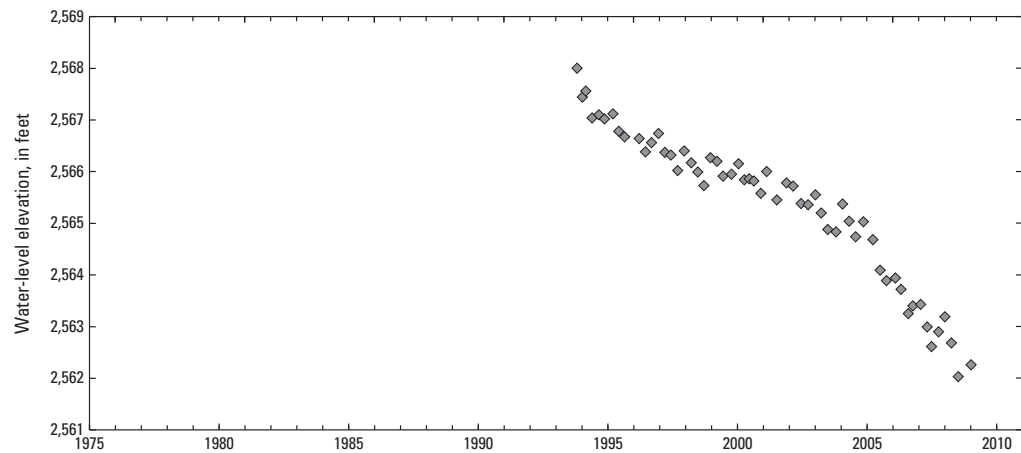


Figure 8. Water-level measurements in observation well 14S/12E-02CCC near Lower Bridge, northeast of Sisters, Oregon, showing continuous water-level declines since the early 1990s. Location of observation well is shown in [figure 4](#).

Changes in Groundwater Recharge from Precipitation

Deep percolation model results show that groundwater recharge in the upper Deschutes Basin has decreased in recent decades due to the drying climate trend (fig. 9). Average annual recharge rates for 1979–88, 1989–98, and 1999–2008, were 3.2, 2.8, and 2.4 million acre-ft/yr, respectively. Groundwater recharge decreased about 25 percent between the 1979–88 and 1999–2008 periods, at a long-term average rate of about 33,500 acre-ft/yr. The decrease in groundwater recharge is manifested as a decrease in discharge of most spring-fed streams. For example, mean annual discharge of Fall River, a spring-fed stream (fig. 3), has decreased from 135 ft³/s (1978–88) to 118 ft³/s (1999–2008), a decrease of about 13 percent. Decreases in mean annual discharge of Fall River between the 1970s (150 ft³/s) and 2000s (110 ft³/s) is even larger, approaching 27 percent. Decreases in recharge and discharge in spring-fed streams are consistent with decreased discharge of groundwater-dominated streams over the past 50 years elsewhere in the Cascade Range documented by Mayer and Naman (2011).

Decreases in Recharge from Lining and Piping Irrigation Canals

Information from OWRD (J.L. La Marche, written commun., 2009) indicates there was substantial lining and piping of irrigation canals in the upper Deschutes Basin between 1994 and 2008. By 2008, canal leakage was reduced by approximately 58,000 acre-ft/yr, a decrease of 16 percent compared to the 356,600 acre-ft/yr in 1994 as estimated by Gannett and others (2001). The decrease in annual groundwater recharge as a result of lining and piping of irrigation canals between 1994 and 2008 is shown in figure 10.

Decreases in Recharge from On-Farm Losses

The OWRD provided a compilation of acreage for which surface-water rights were not exercised to reduce diversions and allow water to remain instream. Reductions in irrigated land area result in decreases in recharge from on-farm losses. Acreage amounts were provided for each irrigation district, as well as non-district areas from 2001 to 2008. The area of idled land varied year to year, generally increasing from 2001 to 2008 with annual totals ranging from about 2,000 to 8,000 acres (J.L. La Marche, OWRD, written commun., 2012). The proportion from non-district areas averaged about 12 percent of the total. Decreases in groundwater recharge resulting from idling land from 2001 to 2008 ranged from approximately 250 to 1,000 acre-feet/yr. This is a small fraction of the approximately 49,000 acre-ft of annual recharge from on-farm losses (Gannett and others, 2001).

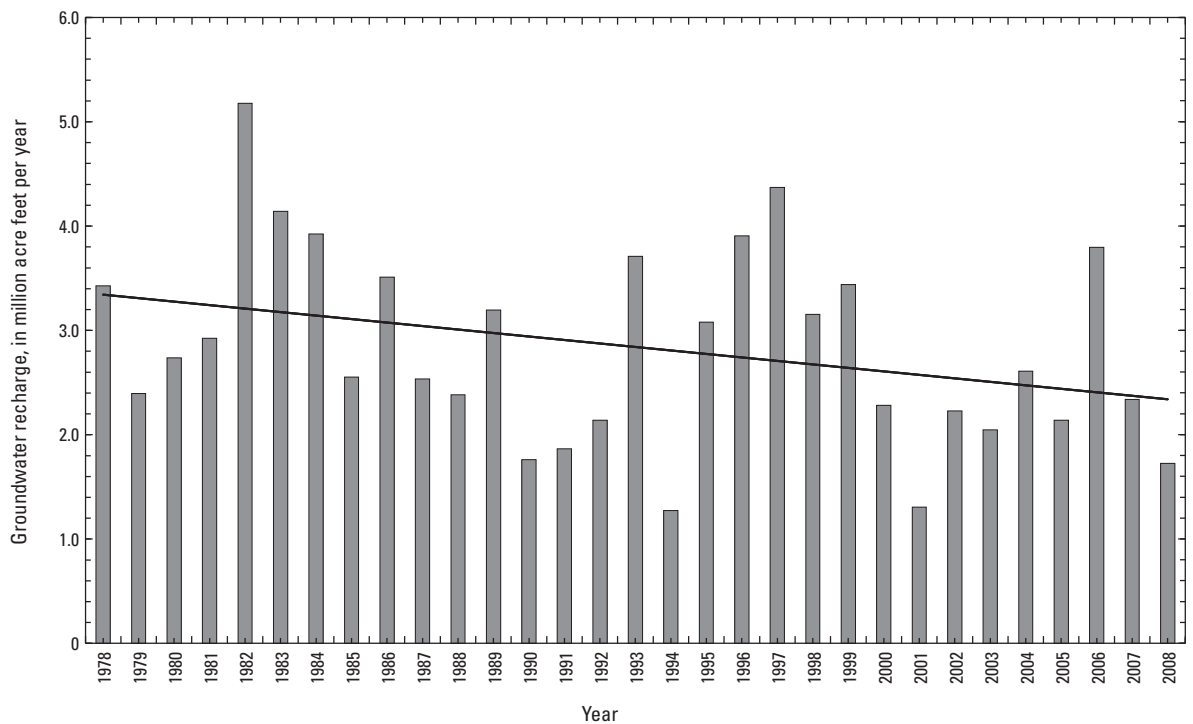


Figure 9. Estimated total annual groundwater recharge in the upper Deschutes Basin, central Oregon, 1978–2008. Line shows linear trend with a slope of about 33,500 acre-ft/yr.

14 Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon

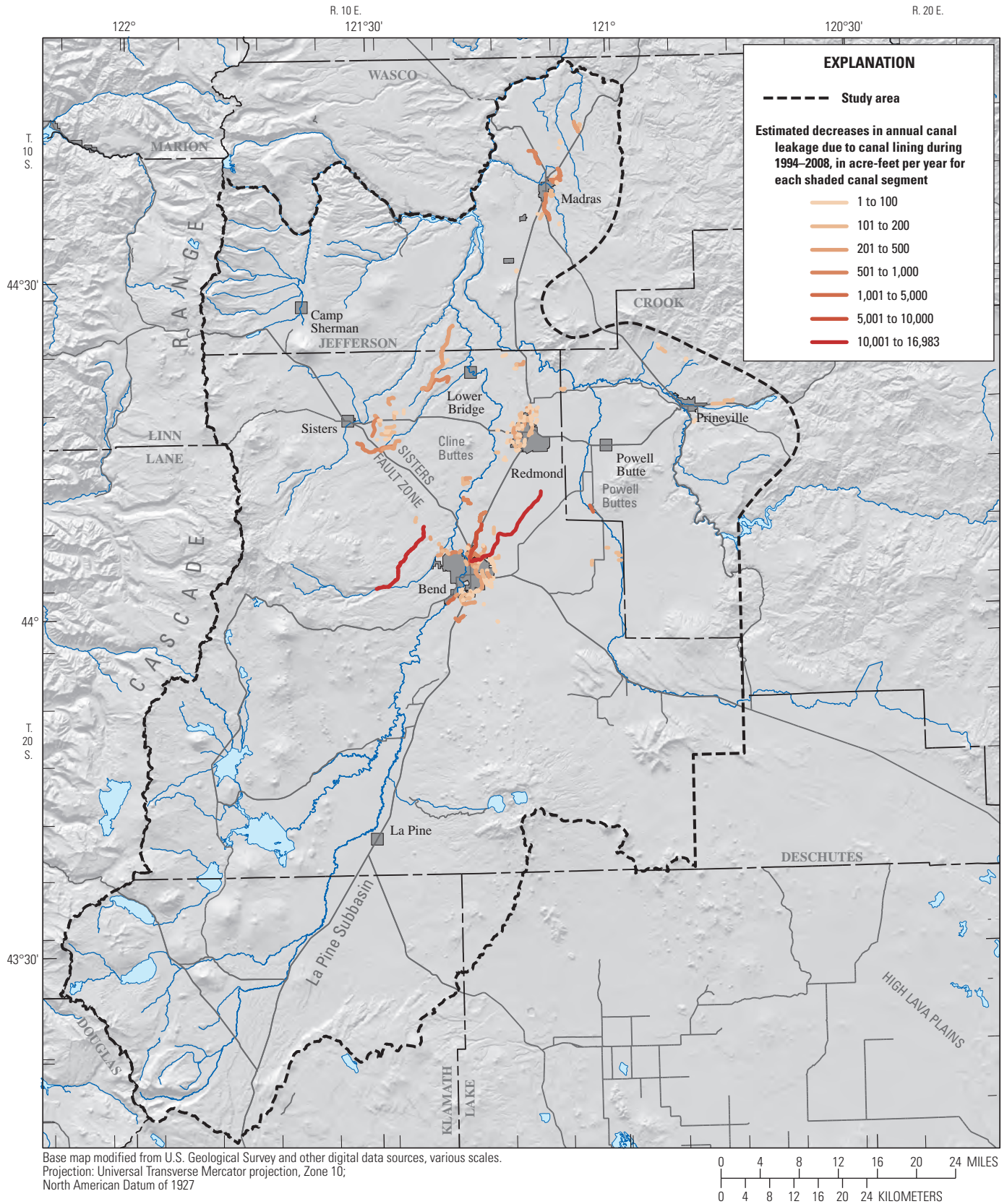


Figure 10. Spatial distribution and magnitude of estimated decreases in annual canal leakage due to lining or piping of irrigation canals between 1994 and 2008 in the upper Deschutes Basin, central Oregon. Data from the Oregon Water Resources Department.

Increases in Pumping

Pumping volumes for municipal and irrigation uses increased about 68 percent between 1994 and 2008. Pumping for irrigation increased from about 17,500 to about 25,000 acre-ft/yr (fig. 11). The different methods of estimating pumpage used for the original model period and the extended model period resulted in slightly different estimates for 1994 (15,000 and 17,500 acre-ft, respectively). For base case simulations used in this analysis, the new estimates were used from 1994 through 2008.

Public-supply pumping increased from 13,400 acre-ft/yr in 1994 to close to 26,800 acre-ft/yr in 2007 (fig. 12).

Reported public-supply pumping decreased to 23,400 in 2008, probably due to normal year-to-year variations in use. Increases in pumping by the Cities of Bend and Redmond, as well as the Avion Water Company, accounted for most of the increase in public-supply use.

Although groundwater pumping has increased, the general distribution is unchanged (fig. 13), as it largely follows established land-use patterns. Public-supply pumping continues to be concentrated in the areas of Bend and Redmond, while irrigation pumping continues to dominate near Sisters, the Lower Bridge area, and north of Powell Buttes.

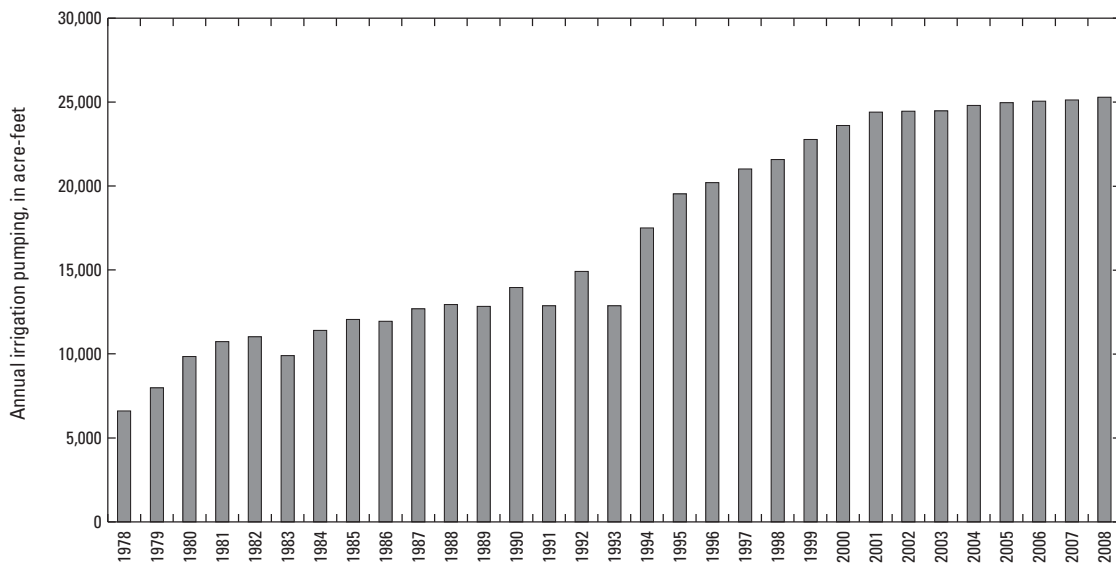


Figure 11. Estimated annual groundwater pumping for irrigation in the upper Deschutes Basin, central Oregon, 1978–2008.

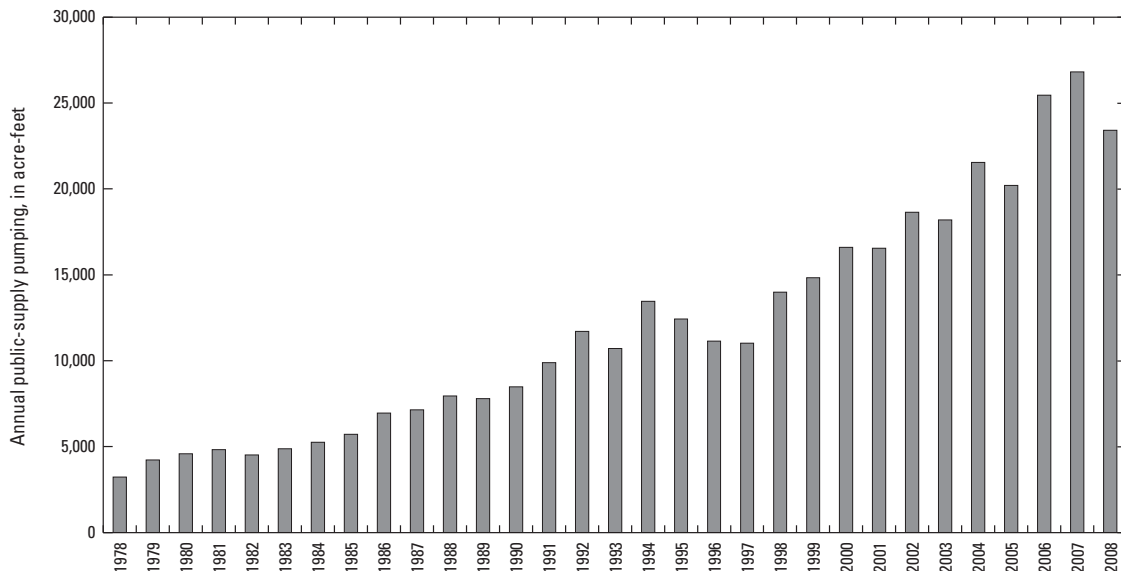


Figure 12. Estimated annual public-supply pumping in the upper Deschutes Basin, central Oregon, 1978–2008.

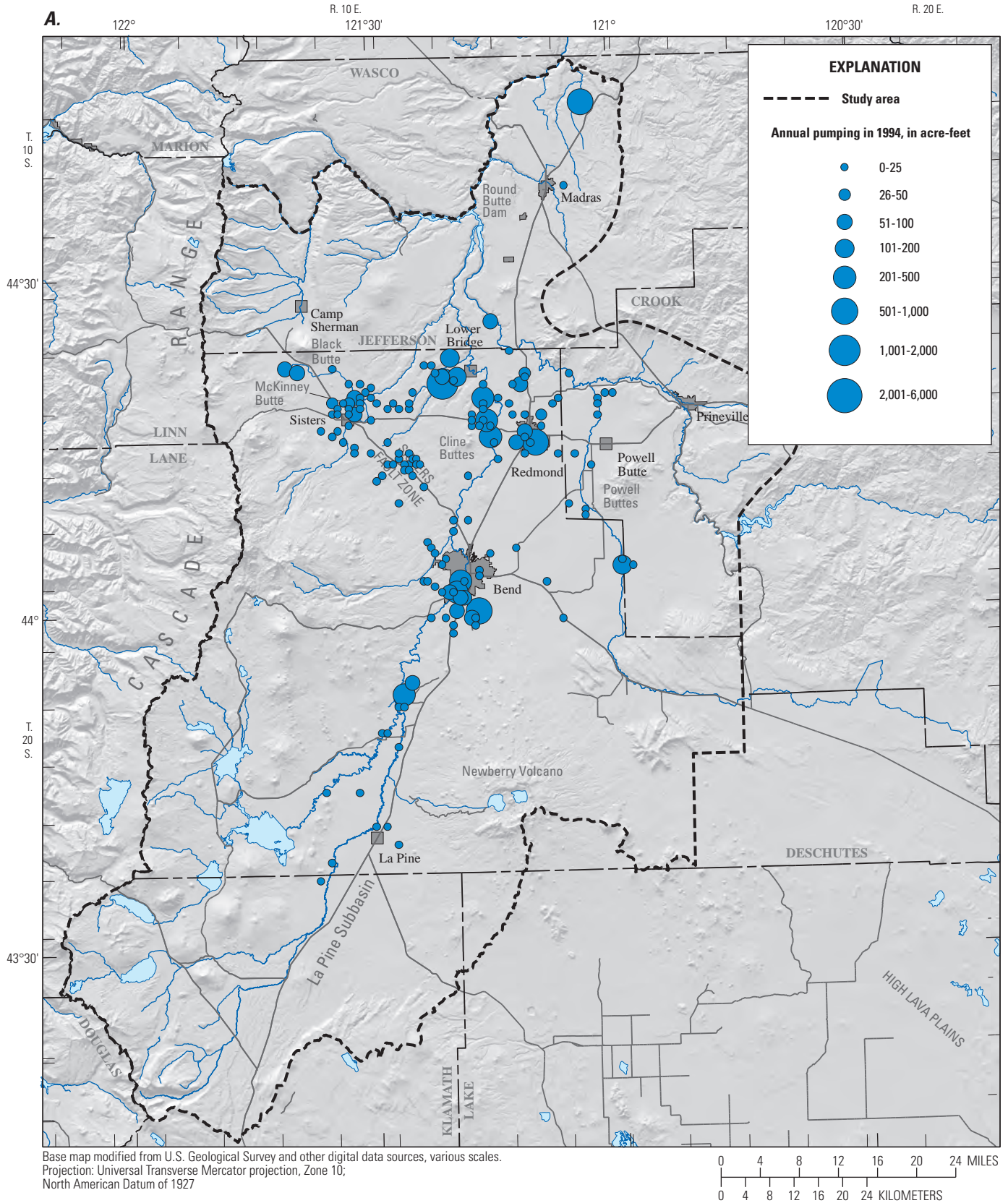


Figure 13. Distribution of groundwater pumping in the upper Deschutes Basin, central Oregon. (A), 1994; (B), 2008; (C), change from 1994 to 2008 (negative values indicate decreases).

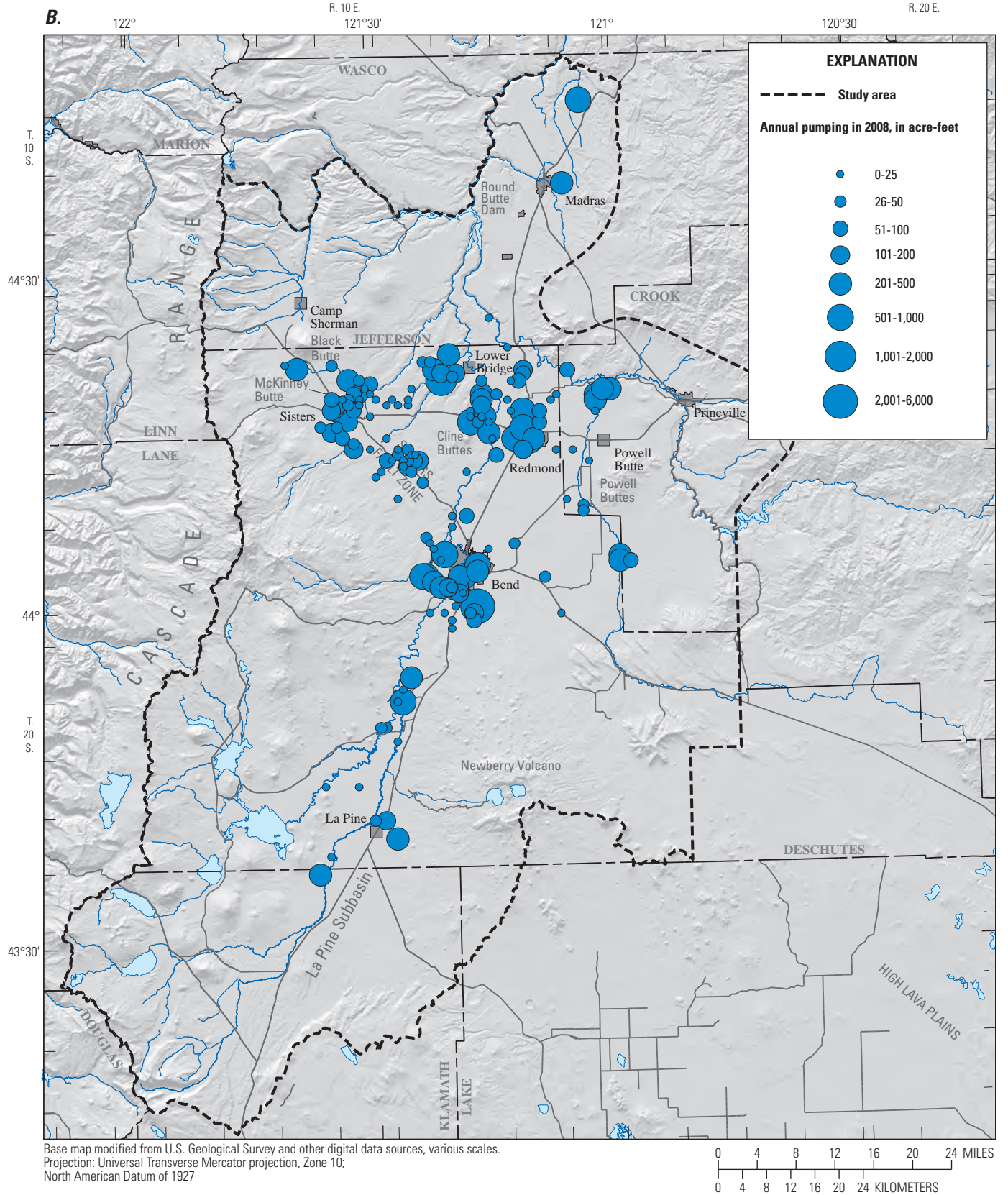


Figure 13.—Continued

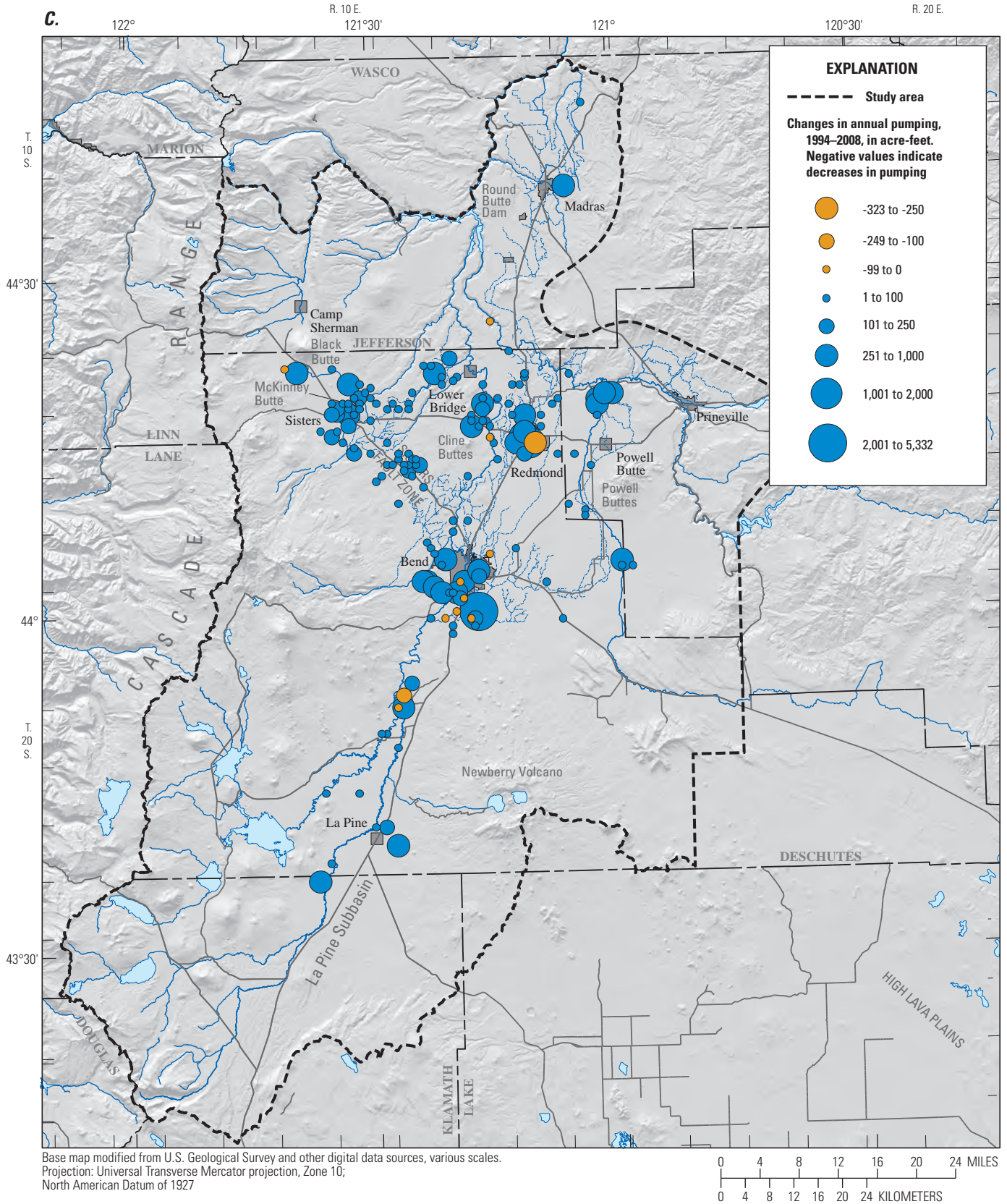


Figure 13.—Continued

Simulation of 1997–2008 Groundwater Conditions

The original model calibration period, which spans the period from 1978 to 1997, included both wet and dry climatic cycles. The varying conditions were reflected in the hydrologic measurements used to calibrate the model. The original model fit was evaluated by comparing measured heads and discharges to their simulated equivalents (Gannett and Lite, 2004). Fitted error statistics (Hill and Tiedeman, 2007) indicate that 68 percent of simulated head values are within about 76 ft of the measured values, and 95 percent of simulated head values are within 152 ft of the measured values. This fit is considered good, given that measured heads vary more than 4,500 ft over the 4,000 mi² model domain. Although the absolute values of measured and simulated heads commonly vary tens of feet, water-level fluctuations, or changes, match much more closely. Gannett and Lite (2004) show that the model does a good job of capturing the temporal variation in hydraulic heads and groundwater discharge caused by climate and other external stresses.

Model runs incorporating the extended model period show that the model does a good job of simulating measured fluctuations in hydraulic heads and groundwater discharge through 2008. [Figure 14](#) shows simulated groundwater discharge to Fall River and Odell Creek along with measured streamflow. Fall River is entirely spring-fed, so the streamflow is directly comparable to the simulated groundwater discharge. Temporal variations in simulated groundwater discharge to Fall River match those of the measured streamflow reasonably well for the original and extended model periods, although absolute discharge volumes are high by 50–75 ft³/s ([fig. 14A](#)). Odell Creek is not entirely groundwater fed, and the streamflow hydrograph shows peaks resulting from storms and snowmelt events superimposed on a relatively robust baseflow of about 50–100 ft³/s. Comparison of simulated groundwater discharge and measured streamflow at Odell Creek shows that the model does a good job simulating the baseflow component of flow in both terms of temporal variations and magnitude through the original and extended model periods.

The model did a generally good job of simulating water-level changes during the original calibration period. In the central part of the upper Deschutes Basin where water-level declines are largest, the simulated water-level changes match observations quite well, although there is an offset in absolute head values of about 25 ft ([fig. 15](#)). Comparison of simulated and measured water-level changes from 1997 to 2008

indicates that the model also performs well in the extended period. Because the focus of this study is to understand the relative magnitude of water-level changes attributable to various stresses, it is most important that the model do an adequate job of simulating the measured temporal variations, and matching absolute heads is less important. Because the model matches measured temporal variations in water levels during the original and extended model periods reasonably well, particularly in the central part of the upper Deschutes Basin, it is considered an appropriate tool for the purposes of this study.

Relative Effects of Climate, Pumping, and Canal Lining

The regional groundwater model was used to determine the relative influence of climate variations, decreased canal leakage, and increased pumping on measured water-level changes. The effects of each of these stresses were isolated by running three simulations, each one including a different combination of the stresses. In the first simulation, climate variations, increased pumping, and decreased canal leakage up to 2008 were all included. This simulation, referred to as the base run, reflects actual conditions and was used to compare simulated and measured water levels. For the second simulation, the recent increase in groundwater pumping was removed by holding post-1994 pumping rates at the 1994 level. Results of this model run are compared to the base run to evaluate the relative influence of the increase in pumping. For the third simulation, both pumping and canal-leakage rates were held constant after 1994. This shows the influence of climate variations alone, and also allows evaluation of the relative influence of decreased canal leakage. The effects of changes in on-farm losses were sufficiently small that they are not considered in the analysis (they were, however, simulated in all model runs). The simulated water-level changes were evaluated at locations where water levels have been monitored since the mid-1990s ([fig. 5](#)).

Water-level changes in some parts of the upper Deschutes Basin, such as the La Pine subbasin and upland areas, are due to climate influences and are largely unaffected by pumping and canal lining. Simulated water levels in the more developed central part of the upper Deschutes Basin (the area encompassing Sisters, Bend, Redmond, and Powell Butte) show the effects of increased pumping and decreased recharge due to canal lining in addition to climate variations.

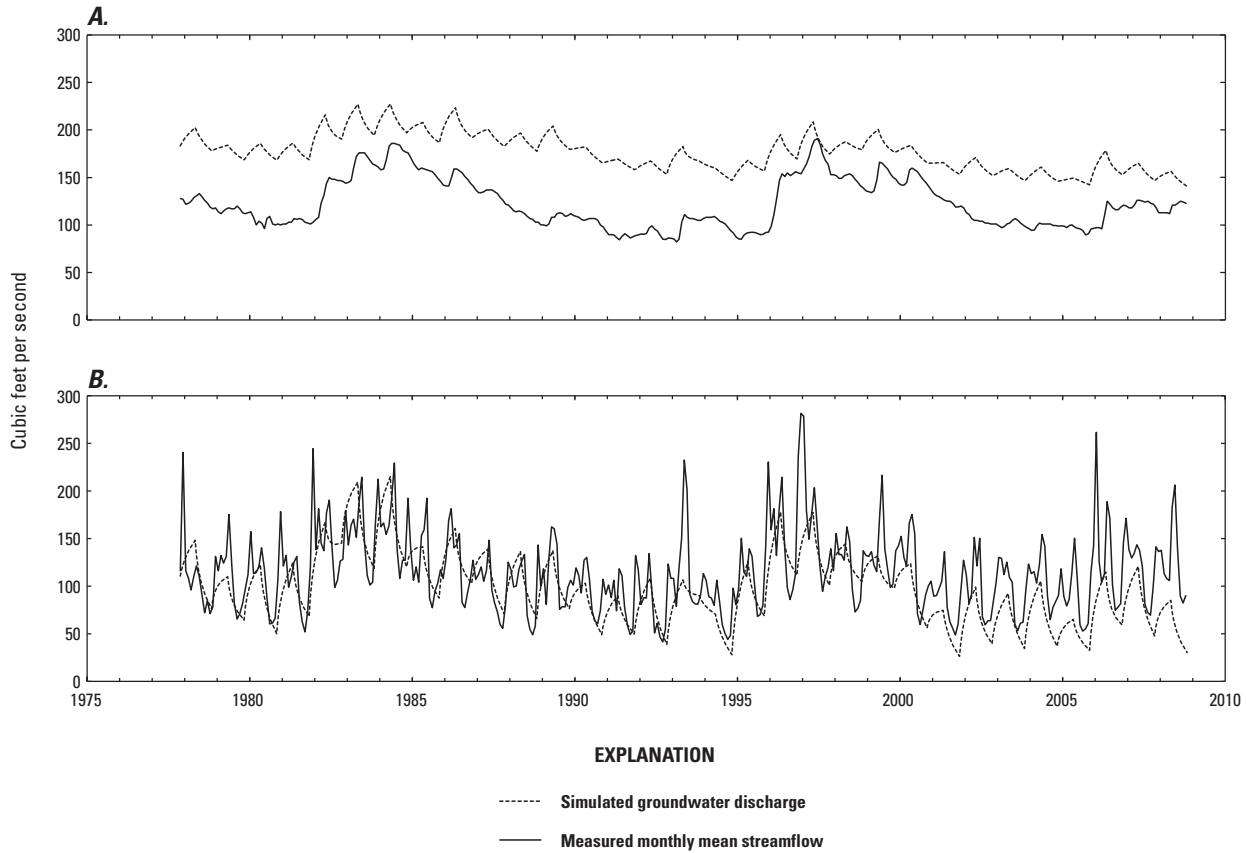


Figure 14. Measured streamflow and simulated groundwater discharge to *A*, Fall River (USGS gage 14057500) and *B*, Odell Creek (USGS gage 14055600), upper Deschutes Basin, central Oregon. Locations of streamflow-gaging stations are shown in [figure 1](#).

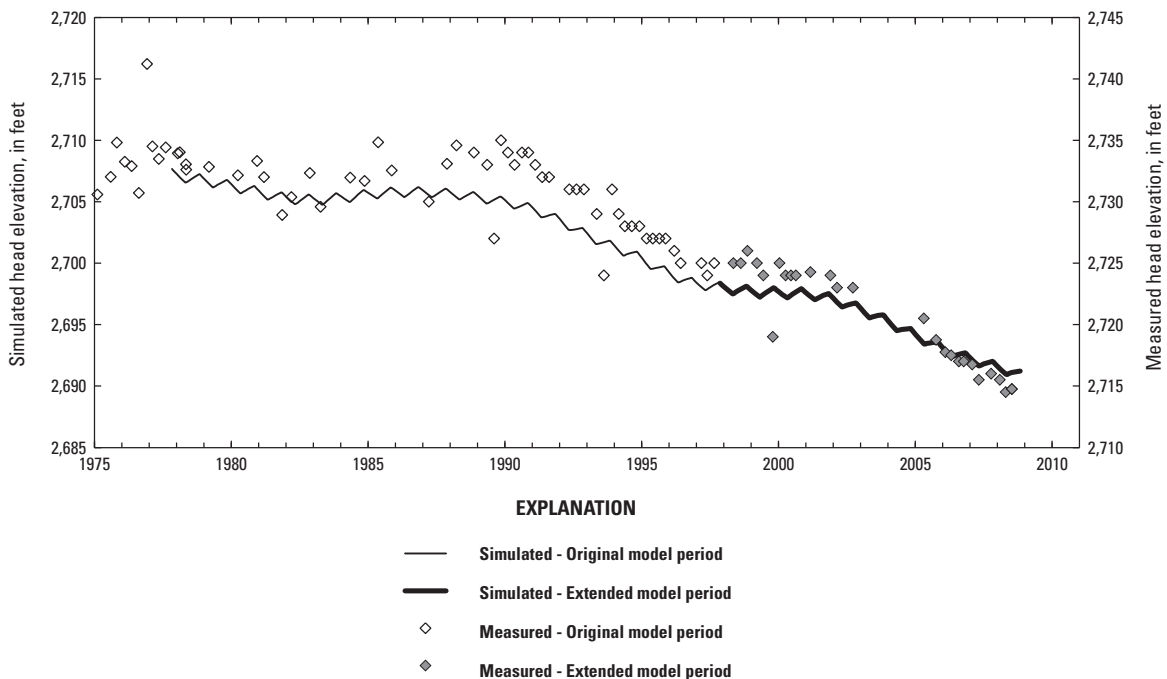


Figure 15. Simulated and measured head elevation in observation well 15S/13E-18ADD1 near Redmond, Oregon. Location of observation well is shown in [figure 4](#).

La Pine Subbasin and Cascade Range

The effects of increased pumping and decreased canal leakage range from small to undetectable in the La Pine subbasin and along the western margin of the upper Deschutes Basin in and near the Cascade Range. In the La Pine subbasin, the effects of decreased canal leakage are too small to be seen on graphs comparing the relative influence of stresses and are not included in the associated figures. The effects of pumping increases since 1994 cannot be seen in shallow parts of the system in the La Pine subbasin, probably due to the relatively small increases in local pumping (fig. 16). In deep wells, post-1994 pumping increases account for about 0.5 ft of the roughly 7-ft net decline in water levels measured since the mid-1990s (fig. 17). The pumping influence seen in deep

zones in the La Pine subbasin may be diminished in shallower depths because of the presence of a thick sequence of saturated fine-grained deposits in the area.

Water levels in the few monitoring wells in and adjacent to the Cascade Range also appear to be minimally affected by post-1994 canal lining and increases in pumping. Pumping influences cannot be discerned on a graph showing simulated water levels in a shallow well in the Camp Sherman area (fig. 18), as the plots with and without post-1994 pumping essentially overlaid one another. A post-1994 water-level decline of several tenths of a foot due to pumping was simulated in a well south of Black Butte (fig. 19). Canal lining influences are not discernible on simulated hydrographs for either well monitored in the Cascade Range.

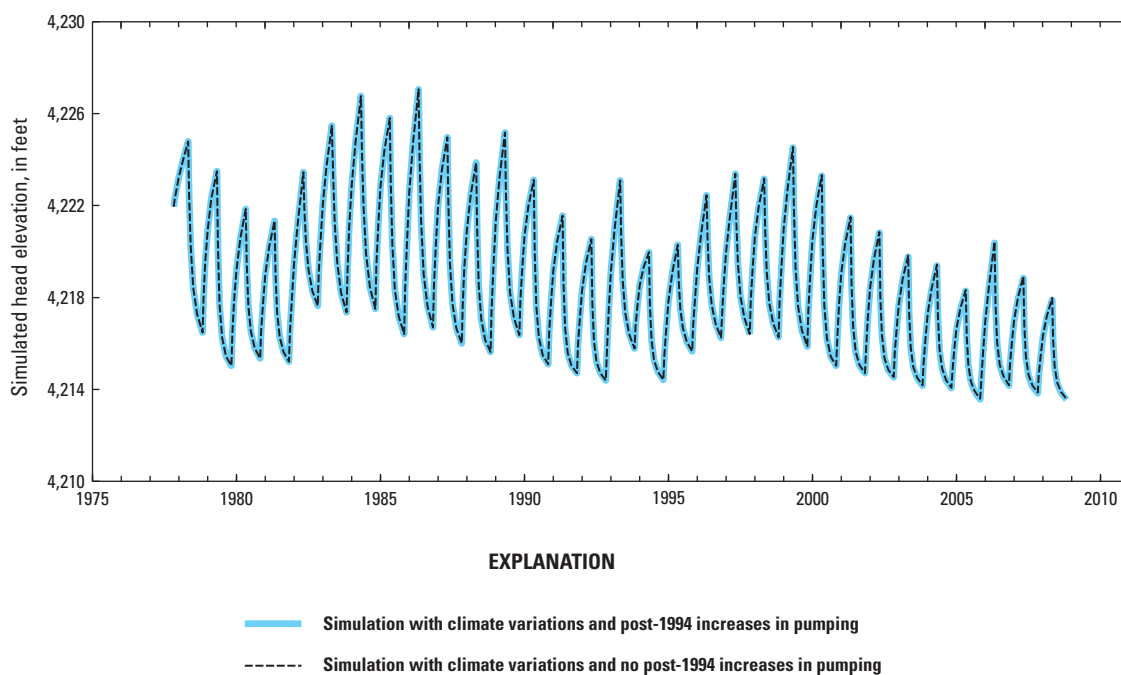
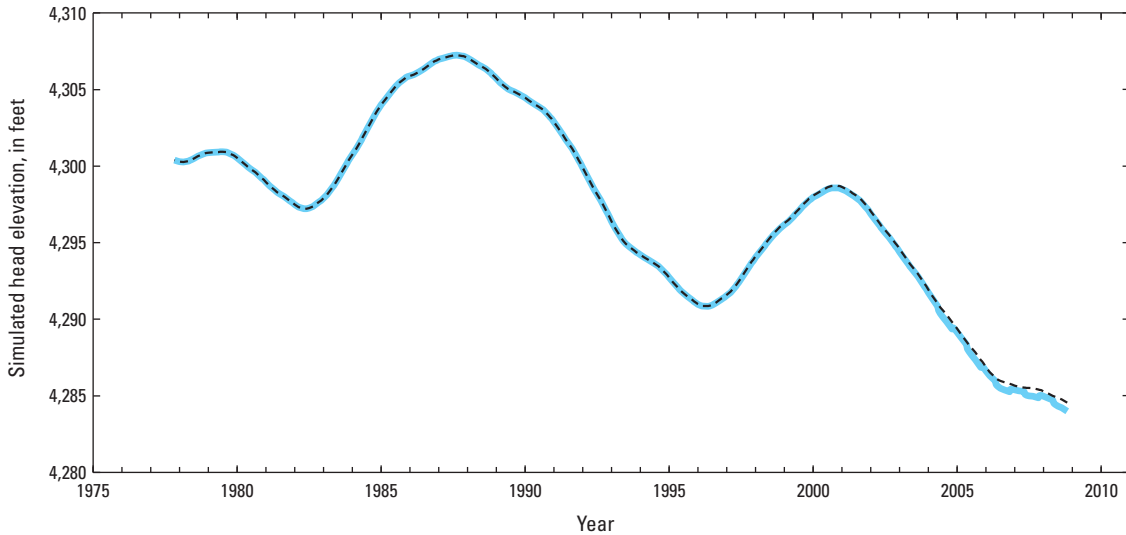


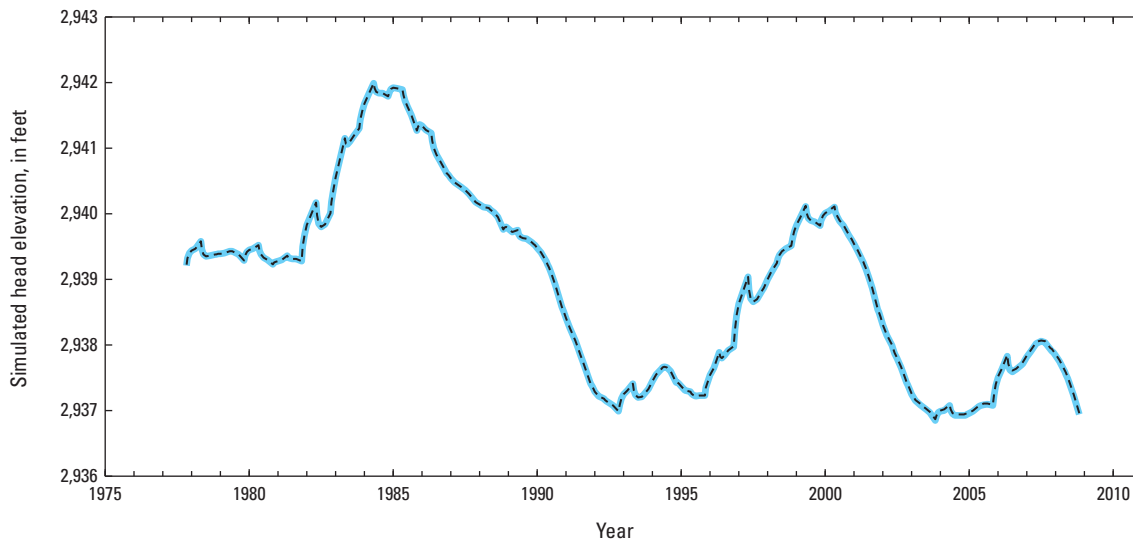
Figure 16. Simulated head elevations in observation well 21S/11E-19CCC, a 100-foot deep well in the La Pine subbasin, central Oregon. Lines showing simulated head elevations with and without post-1994 pumping increases are coincident on the graph, indicating very limited impact from post-1994 pumping increases. Effects of post-1994 canal lining are too small to show at the scale of this graph. Location of observation well is shown in figure 4.



EXPLANATION

- Simulation with climate variations and post-1994 increases in pumping
- - - Simulation with climate variations and no post-1994 increases in pumping

Figure 17. Simulated head elevations in observation well 22S/10E-10DDD01, a 1,458-foot deep well near La Pine, central Oregon. Comparison of simulated heads with and without the post-1994 groundwater pumping increases indicates that post-1994 growth in pumping accounts for about 0.5 foot of water-level decline as of 2008. Effects of post-1994 canal lining are too small to show at the scale of this graph. Location of observation well is shown in [figure 4](#).



EXPLANATION

- Simulation with climate variations and post-1994 increases in pumping
- - - Simulation with climate variations and no post-1994 increases in pumping

Figure 18. Simulated head elevations in observation well 13S/09E-03AAC02 near Camp Sherman, Oregon. Lines showing simulated heads with and without post-1994 groundwater pumping increases cannot be discriminated on the graph, indicating very limited impact from post-1994 pumping increases. Effects of post-1994 canal lining are too small to show at the scale of this graph. Location of observation well is shown in [figure 4](#).

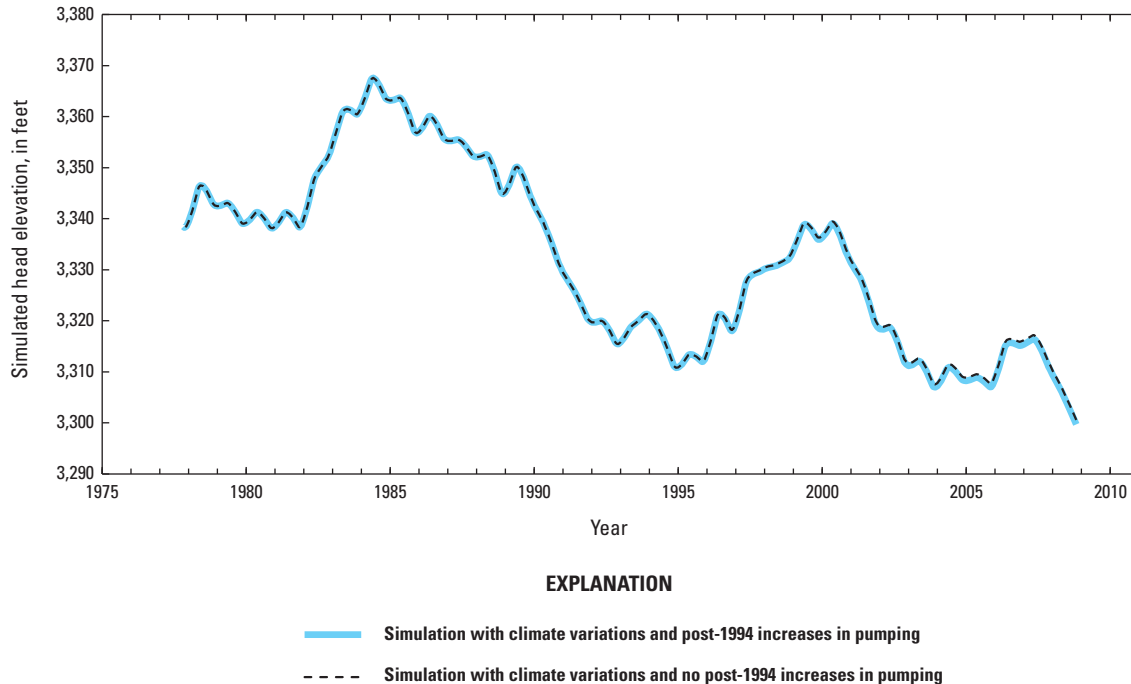


Figure 19. Simulated head elevations in observation well 14S/09E-08ABA south of Black Butte, Oregon. Comparison of simulated heads with and without post-1994 groundwater pumping increases indicates that post-1994 growth in pumping accounts for water-level declines of several tenths of a foot. Effects of post-1994 canal lining are too small to show at the scale of this graph. Location of observation well is shown in [figure 4](#).

Sisters Area

Water-level trends in the Sisters area differ on either side of McKinney Butte. McKinney Butte lies along the Sisters fault zone, which demarks a transition zone east of which water-level fluctuations observed in the Cascade Range become diffused and attenuated. West of the McKinney Butte, measured water levels have risen about 10 ft since 2005 in a manner similar to that observed in the Cascade Range. Such a post-2005 rise in water levels generally is not observed east of McKinney Butte.

Simulations show that about 80 percent of the roughly 22-foot water-level declines in the western part of the Sisters area since the peak of the most recent wet period (about 2000) are due to climate, and that pumping and canal lining are responsible for approximately 13 and 7 percent of declines, respectively ([fig. 20](#)). Of the 20- to 25-ft decline in water levels observed just east of the Sisters area since 2000, about 65–70 percent can be attributed to climate. The remaining 30–35 percent (about 6–8 ft) can be attributed to increased pumping and canal lining in nearly equal proportions ([fig. 21](#)).

Lower Bridge Area

Water levels in the two wells monitored in the Lower Bridge area northwest of Sisters have declined about 5–6 ft since the mid-1990s ([figs. 22](#) and [23](#)). The decline has been more or less continuous except during the wet period between the mid-1990s and 2000, a period during which water levels rose very slightly ([fig. 22](#)), or the decline rate flattened out ([fig. 23](#)). The general lack of a significant water-level rise in the Lower Bridge area in response to wet conditions during the late 1990s is typical of wells in the central part of the upper Deschutes Basin around Redmond. It is probable that recharge pulse during this relatively short wet period was largely attenuated by diffusion as it moved west from the Cascade Range and was insufficient to overcome the longer term drying trend apparent in the central part of the basin. Simulations in the Lower Bridge area show that about 60–70 percent of the water-level decline measured since the mid-1990s can be attributed to climate, about 20–30 percent can be attributed to increases in groundwater pumping, and about 10 percent is due to canal lining.

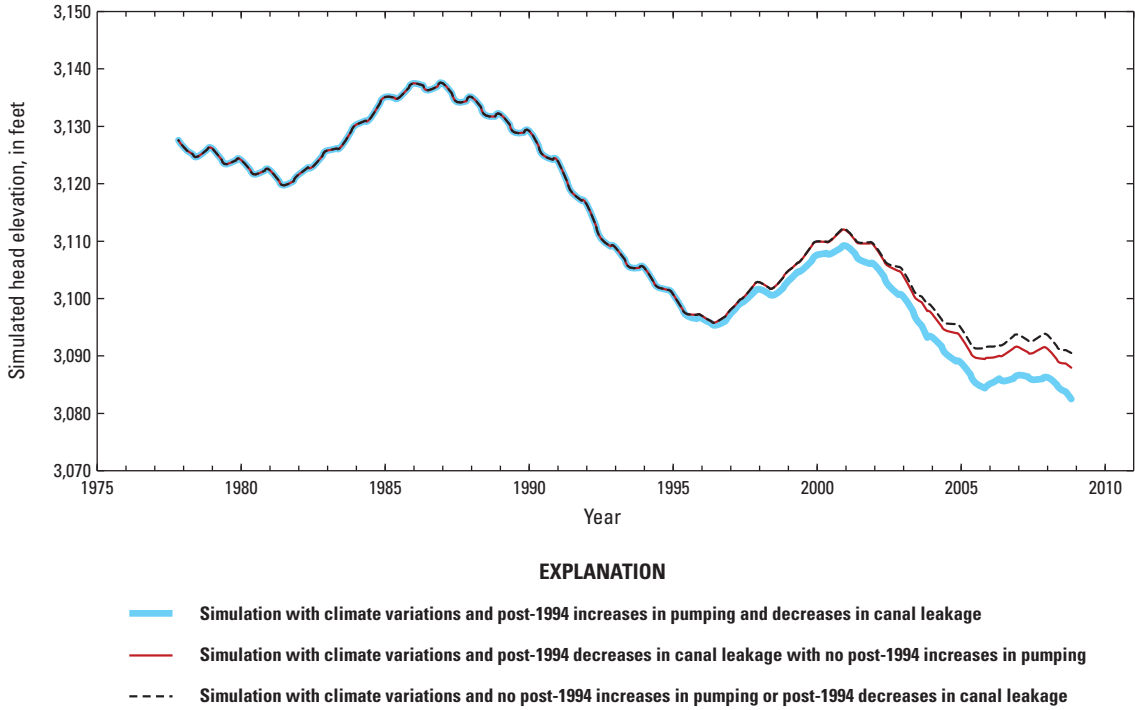


Figure 20. Simulated head elevations in well 15S/10E-08ACD near Sisters, Oregon.

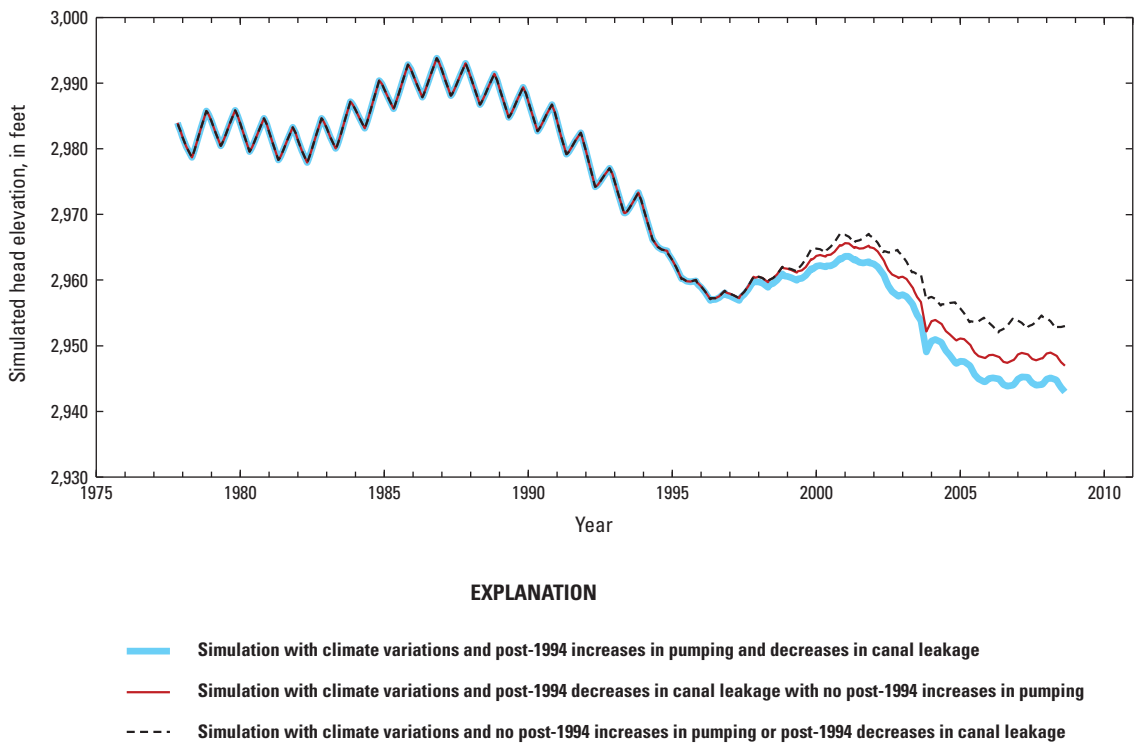
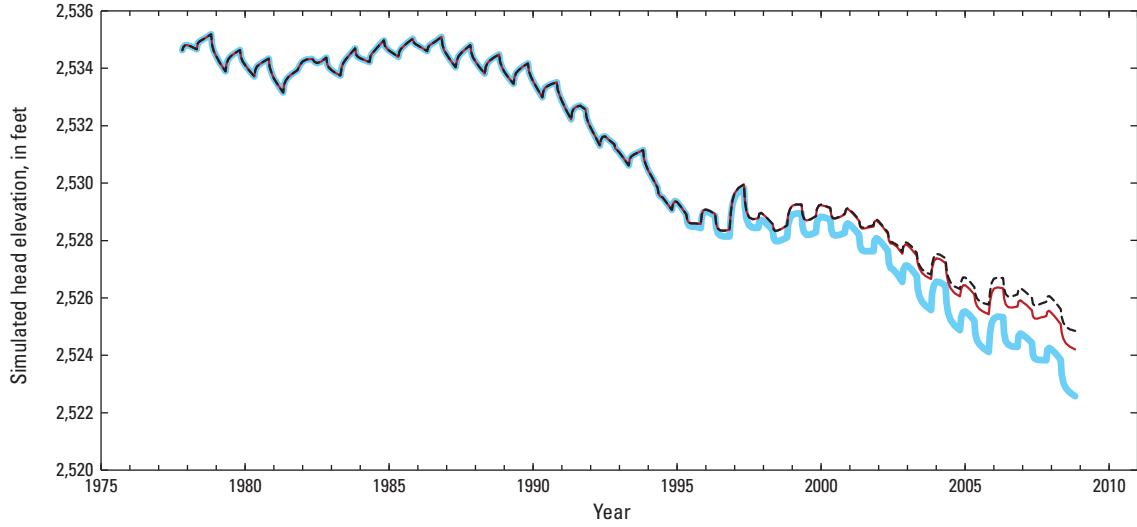


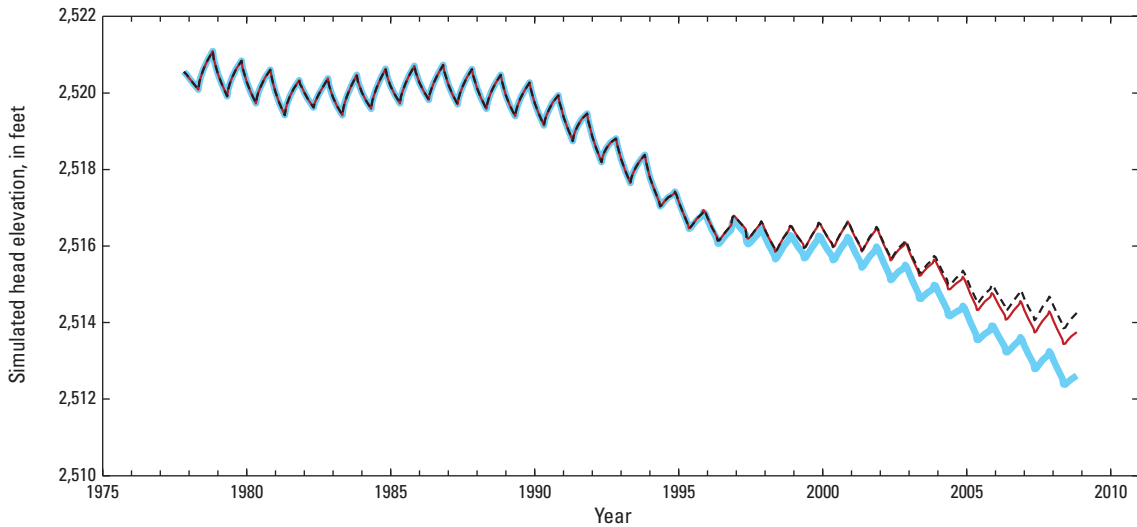
Figure 21. Simulated head elevations in well 15S/10E-02CDA east of Sisters, Oregon.



EXPLANATION

- Simulation with climate variations and post-1994 increases in pumping and decreases in canal leakage
- Simulation with climate variations and post-1994 decreases in canal leakage with no post-1994 increases in pumping
- - - Simulation with climate variations and no post-1994 increases in pumping or post-1994 decreases in canal leakage

Figure 22. Simulated head elevations in well 14S/11E-01DDD1 near Lower Bridge, upper Deschutes Basin, central Oregon.



EXPLANATION

- Simulation with climate variations and post-1994 increases in pumping and decreases in canal leakage
- Simulation with climate variations and post-1994 decreases in canal leakage with no post-1994 increases in pumping
- - - Simulation with climate variations and no post-1994 increases in pumping or post-1994 decreases in canal leakage

Figure 23. Simulated head elevations in well 14S/12E-02CCC near Lower Bridge, upper Deschutes Basin, central Oregon.

Cline Buttes to Redmond Area

Water levels in the area between Cline Buttes and Redmond have declined about 12–14 ft since the mid-1990s. As in the Lower Bridge area to the northwest, the decline has been more or less continuous since the mid-1990s. Declines persisted in the area west of Redmond, at a lesser rate in some wells, throughout the wet period in the late 1990s (figs. 24 and 25). Simulations show that about 60–70 percent of the measured decline in the area between Cline Butte and Redmond is likely due to climate influences, while 20–25 percent is due to increases in pumping, and 5–10 percent is the result of decreased recharge due to canal lining.

Water-level declines in the area between Cline Buttes and Redmond are about double those observed in the Lower Bridge area, even though the shapes of the trends are very similar. The declines in the Lower Bridge area may be attenuated because of proximity to the discharge area along

the Deschutes River. Head-dependent flux boundaries, such as the gaining streams in the area, tend to buffer water-level fluctuations.

Redmond to Powell Butte Area

Water levels in the area between Redmond and the community of Powell Butte have had declines of about 13–14 ft since 1995. The decline has been persistent, but the rate of decline lessened during the wet period in the late 1990s (fig. 26). Like the Lower Bridge area, the Redmond to Powell Buttes area did not experience a water-level recovery during the late-1990s wet period, most likely because of the attenuation of the recharge pulse with distance from the Cascade Range recharge area. Simulations indicate that about 60–65 percent of the measured decline is due to climate, about 25–30 percent is due to post-1994 increases in pumping, and about 10 percent is due to decreases in recharge due to canal lining since the mid-1990s.

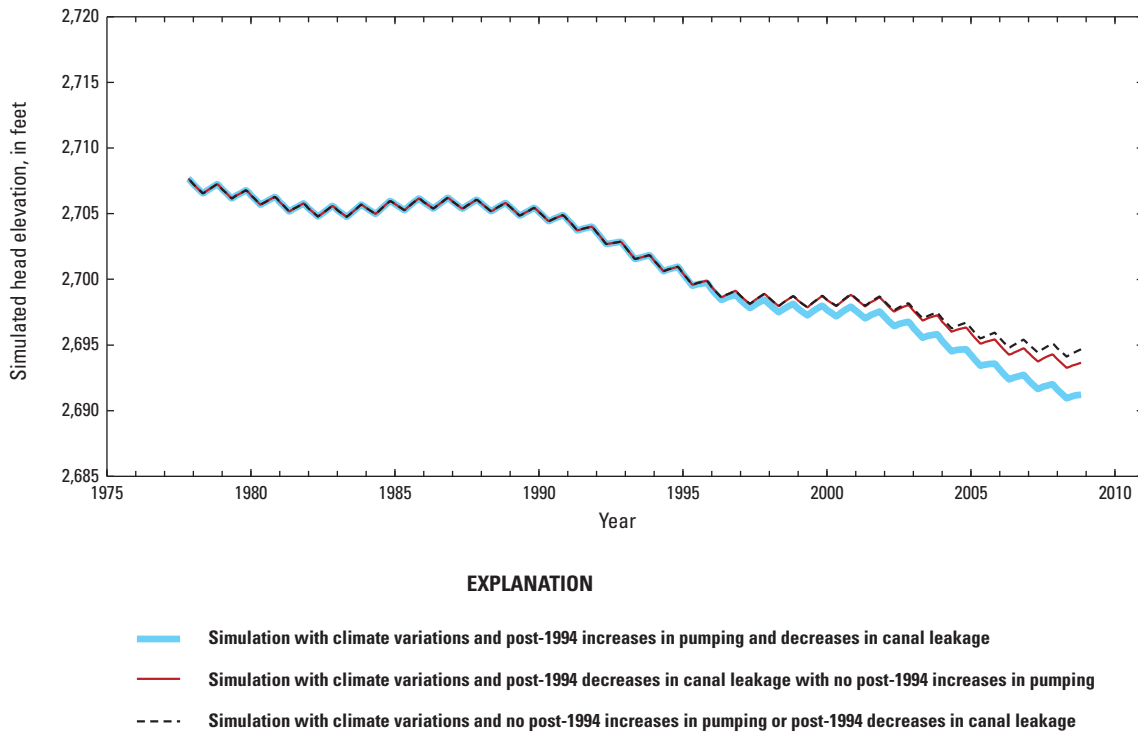
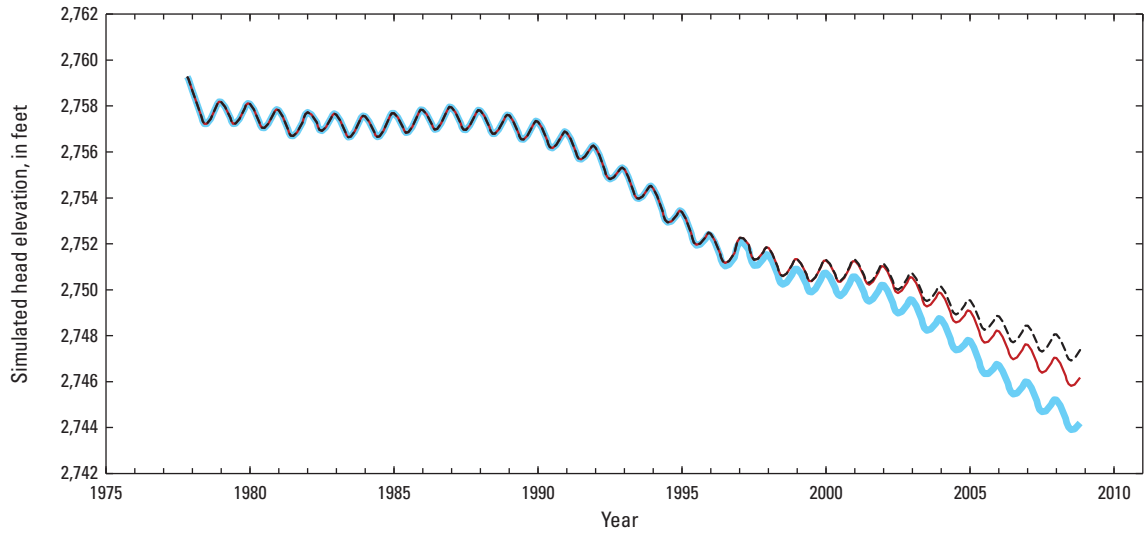


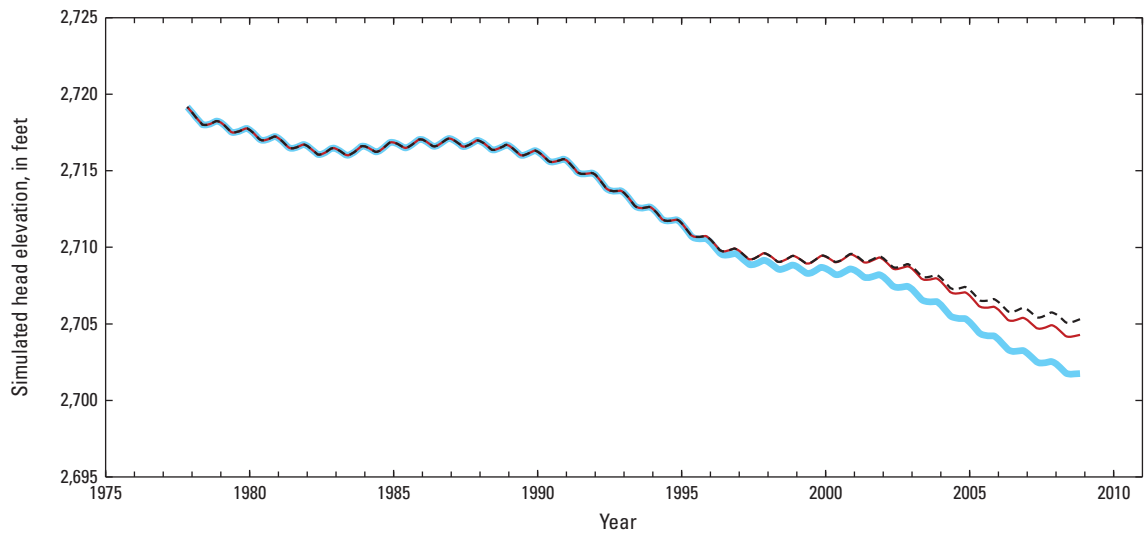
Figure 24. Simulated head elevations in well 15S/13E-18ADD1 near Redmond, Oregon.



EXPLANATION

- Simulation with climate variations and post-1994 increases in pumping and decreases in canal leakage
- Simulation with climate variations and post-1994 decreases in canal leakage with no post-1994 increases in pumping
- - - Simulation with climate variations and no post-1994 increases in pumping or post-1994 decreases in canal leakage

Figure 25. Simulated head elevations in well 15S/12E-14CDD west of Redmond, Oregon.



EXPLANATION

- Simulation with climate variations and post-1994 increases in pumping and decreases in canal leakage
- Simulation with climate variations and post-1994 decreases in canal leakage with no post-1994 increases in pumping
- - - Simulation with climate variations and no post-1994 increases in pumping or post-1994 decreases in canal leakage

Figure 26. Simulated head elevations in well 15S/13E-21ADB1 near Redmond, Oregon.

Spatial Distribution of Pumping and Canal-Lining Influences

Maps showing simulated water-level changes resulting from post-1994 increases in pumping and decreased recharge due to canal lining can provide insights into the spatial distribution and magnitude of the impacts from these stresses. Such maps are created by subtracting 2008 water levels in each cell simulated in the base run from the 2008 water levels for the same cells from model runs during which post-1994 pumping or canal leakage were held at 1994 rates. Water-level changes resulting from decreases in canal leakage or due to increases in pumping vary with depth. Pumping impacts are largest at depths (and in strata) from which the water is being withdrawn. The effects of canal lining, in contrast, are most prominent at shallow depths closest to canals, and attenuate with depth.

The simulated water-level declines due to the post-1994 growth in groundwater pumping are generally centered on the area around Bend, Sisters, Redmond, and Powell Butte ([fig. 27](#)). In model layer 1, which corresponds to the upper 100 ft of the saturated zone (the zone beneath the water table), post-1994 pumping-related declines range from 1 to 5 ft over most of the populated part of the basin as of 2008, with local

areas of up to 10 ft near centers of concentrated pumping near Sisters, Bend, and Powell Butte ([fig. 27A](#)). Deeper in the aquifer system, in model layer 3 (200- to 300-ft below the water table), the pumping-related declines are more evenly spread out, but still generally range from 1 to 5 ft, with some areas showing declines of 10–50 ft in the Bend area ([fig. 27B](#)). As described in preceding sections, simulated impacts from post-1994 pumping are consistent with measured water levels at observation wells. There are no monitoring wells in the Bend area in the areas where simulations show possible impacts.

Simulated water-level declines resulting from decreased groundwater recharge due to canal lining since 1994 range from 1 to 5 ft as of 2008, over a broad area encompassing Bend, lower Tumalo Creek, the Sisters area, and Redmond ([fig. 28](#)). Simulated water-level declines are as much as 68 ft in model layer 1, however, adjacent to canals with the largest reported decreases in leakage ([fig. 28A](#)). Simulated post-1994 water-level declines due to canal lining are more subdued, generally less than 10 ft, in model layer 3, with declines of up to about 15 ft near Tumalo Creek ([fig. 28B](#)). Simulations show that water-level declines up to 10 ft in adjacent to lined canals near Madras as of 2008.

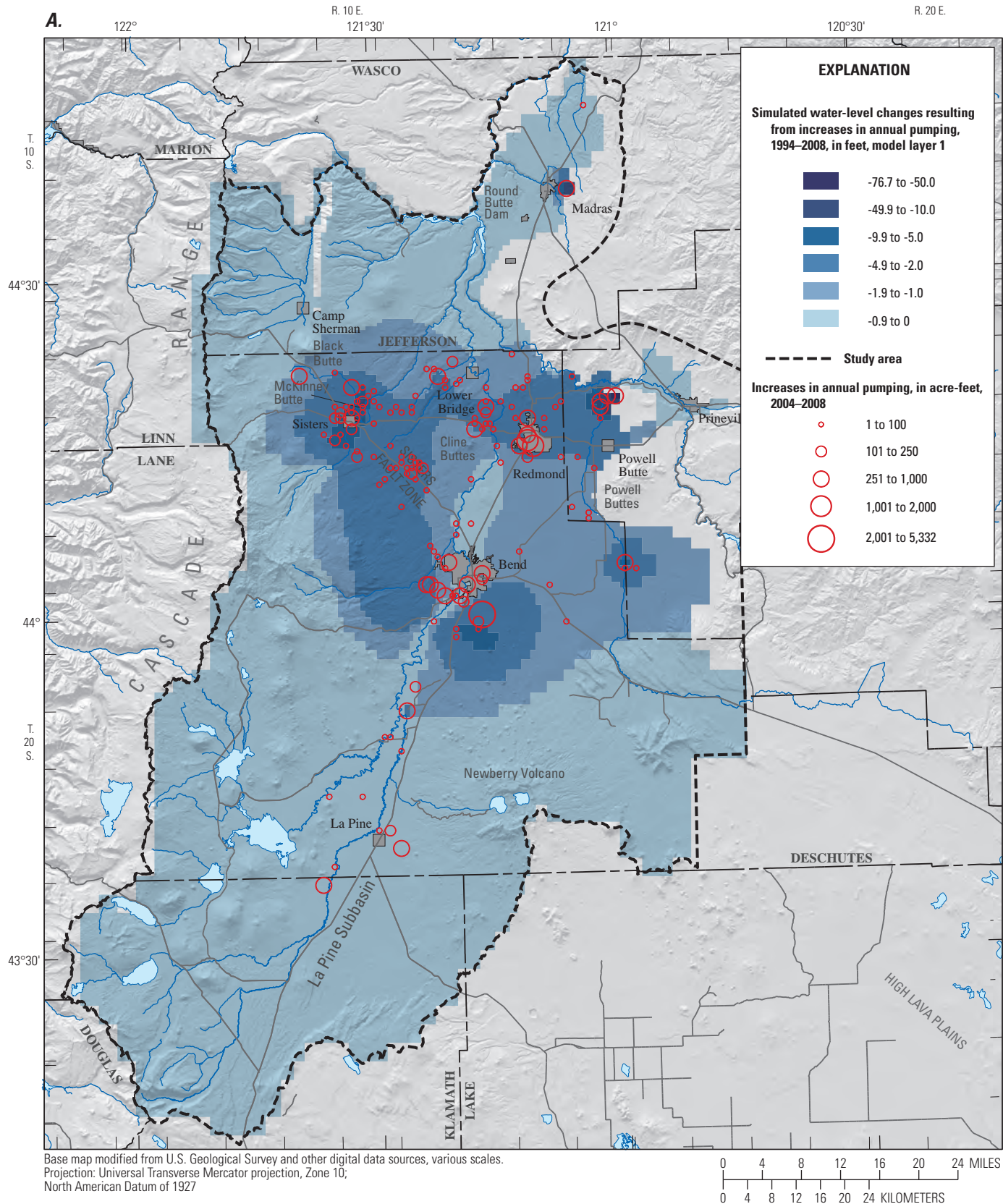


Figure 27. Increases in groundwater pumping since 1994 and simulated groundwater-level declines resulting only from post-1994 increases pumping in the upper Deschutes Basin, Oregon as of 2008. (A), model layer 1; (B), model layer 3.

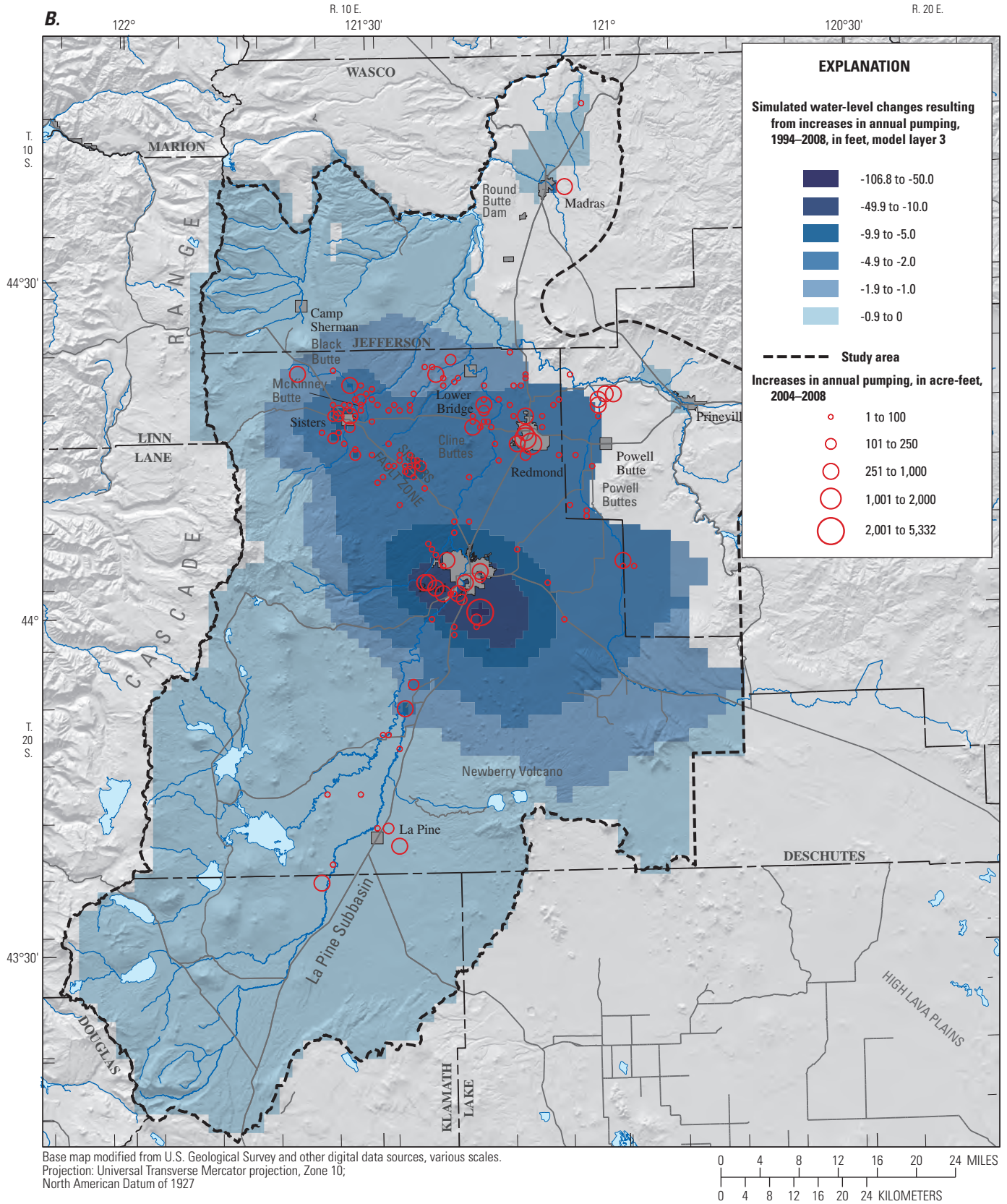


Figure 27.—Continued

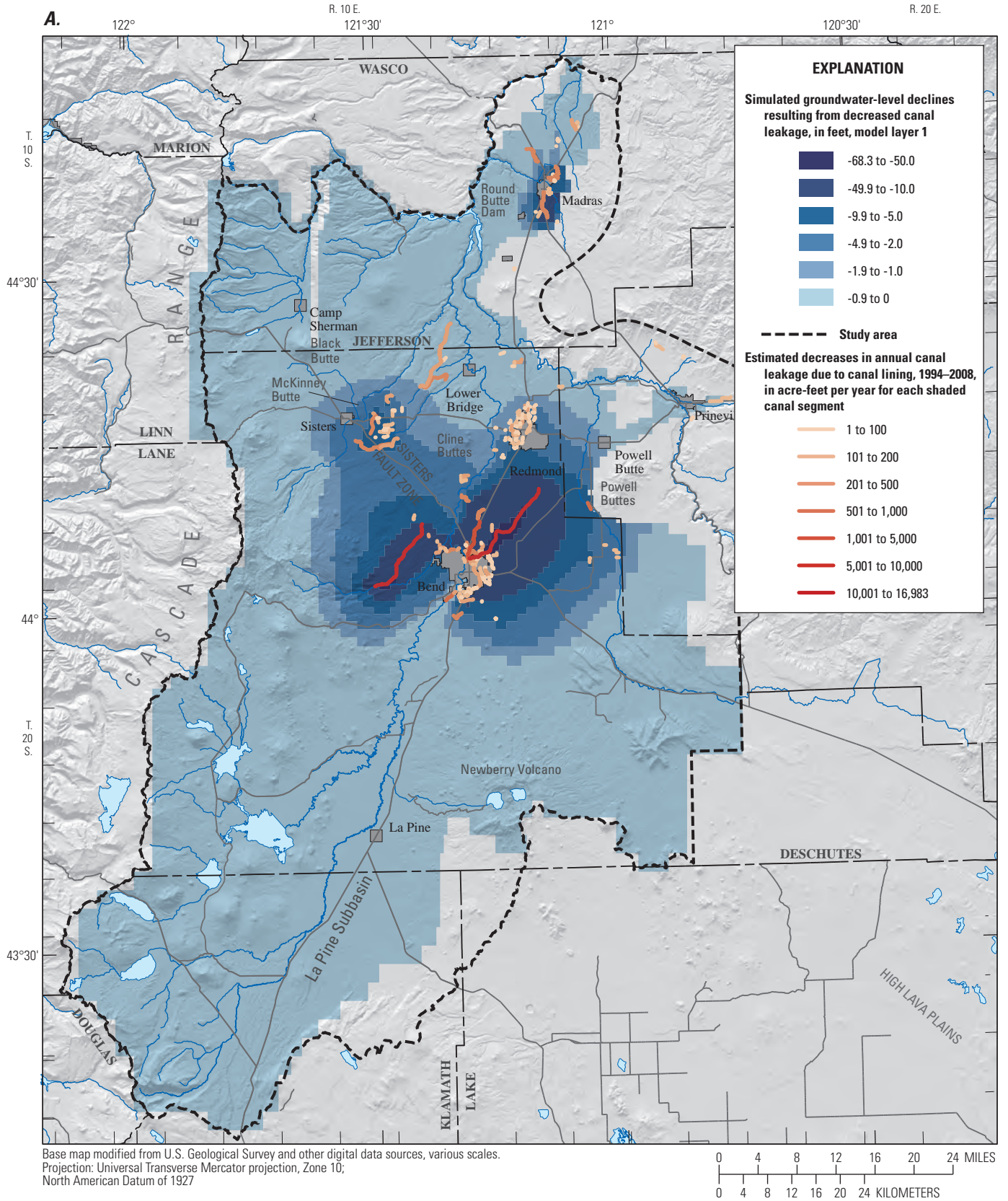


Figure 28. Upper Deschutes Basin, Oregon, showing estimated decreases in annual canal leakage due to canal lining between 1994 and 2008, and simulated groundwater-level declines resulting from decreased canal leakage. (A) model layer 1; (B) model layer 3.

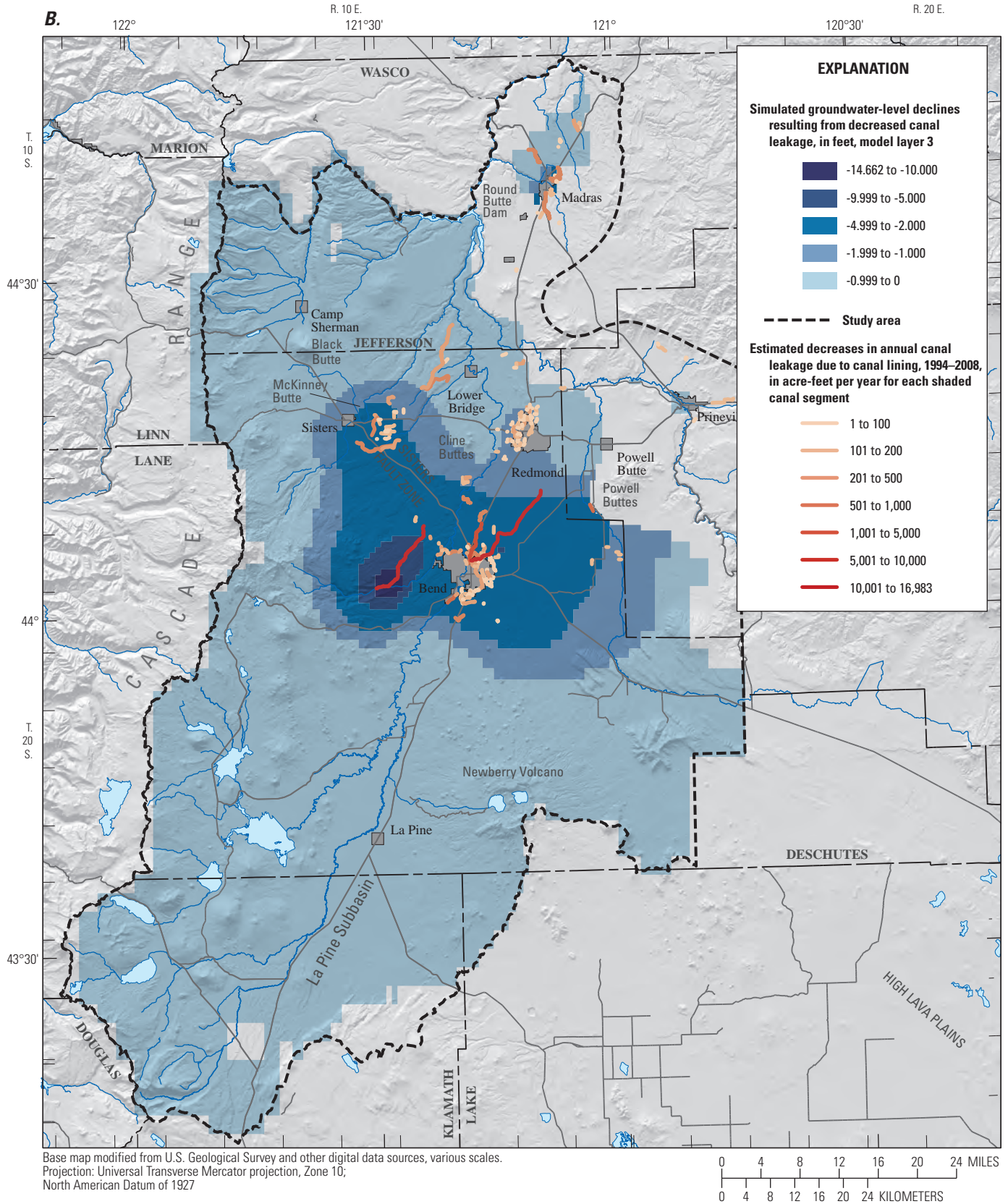


Figure 28.—Continued

Summary

Water levels in the central parts of the upper Deschutes Basin have declined by as much as 14 ft since the mid-1990s. The factors that affect groundwater levels in the basin and that are contributing to the measured declines include climate variations (both long-term trends and decadal cycles), increases in groundwater pumping, and decreases in artificial recharge due to lining of irrigation canals. The relative contribution of each of these factors has been evaluated using a groundwater-flow model. Water-level changes are dominated by climatic influences. In the central part of the basin, however, increases in groundwater pumping and decreases in recharge due to canal lining have significantly contributed to water-level declines.

The upper Deschutes Basin has experienced a general drying trend for the past several decades. The drying trend is manifested as a decrease in annual mean flow of many streams in the region, as well as decreases in groundwater discharge to spring-fed streams such as Fall River since 1950. Decreases in streamflow since the late 1950s in the Cascade Range and throughout the Pacific Northwest are well documented. Groundwater recharge calculated for this study using the Deep Percolation Model decreased about 25 percent between the 1979–88 period and the 1999–2008 period. A decrease in groundwater recharge is consistent with historical measurements that show that the discharge of spring-fed streams has also decreased in recent decades.

Superimposed on this long-term trend are seasonal variations and cyclic wet and dry periods (drought cycles) that occur on decadal time scales. The basin experienced a wet period from the mid-1990s to about 2000 that was followed by a dry cycle that lasted until about 2005. Climate conditions were normal or wetter than normal from 2006 to 2008. In response, measured groundwater levels in the Cascade Range, the principal groundwater recharge area, rose about 20 ft from the mid-1990s to 2000, and then declined a similar amount between 2000 and 2005. Water levels again rose as much as 10 ft between 2005 and 2008. The period of record for monitored wells in the Cascade Range is too short to discern the multi-decadal decrease observed in the streamflow and precipitation data.

The decadal climate cycles observed in the Cascade Range groundwater levels are increasingly attenuated toward the east in the central parts of the basin. Moving east from Sisters, for example, the decadal variations observed in the Cascades are more subtle, and the hydrographs are increasingly dominated by the multi-decadal declining trend. The short-term wet periods that result in marked rises in groundwater levels in the Cascade Range manifest in the interior parts of the basin as decreases in the rates of water-level declines.

Model analysis has provided insights into the relative contribution of climate variations, increased pumping, and increased canal lining on measured groundwater-level

declines in the upper Deschutes Basin. Modeling has also provided insights into the geographic distribution of the response to these stresses. The effects of increased pumping and increased canal lining, as it turns out, are largely limited to the developed interior parts of the basin extending north-south roughly from Benham Falls north to Lower Bridge, and east-west from the area of Sisters to Powell Butte (the eastern extent of the model). Decreases in recharge due to on-farm losses (deep percolation of applied irrigation water) were included in the simulation analysis but were sufficiently small that they were considered negligible and not included in the discussion.

Water levels in the Sisters area rise and decline in response to climate in a manner similar to that observed in the Cascade Range. Despite longer term declines, 2008 water levels in the Sisters area were at or above the mid-1990s levels due to wet climatic conditions. West of McKinney Butte, water levels observed in the Sisters area have risen about 10 ft since 2005. Water-level trends in the Sisters area east of McKinney Butte, however, have remained flat, possibly reflecting the effects of the Sisters Fault Zone and larger distance from the principal recharge area in the Cascade Range. Simulations show that post-1994 canal lining and increases in groundwater pumping may be jointly responsible for head losses of approximately 6–8 ft in the Sisters area as of 2008.

The Lower Bridge area northeast of Sisters has experienced water-level declines of about 5 to 6 ft since the mid-1990s. Of these measured declines, about 3–4 ft, or 60–70 percent, can be attributed to climate, 1–2 ft, or about 20–30 percent, to post-1994 increases in pumping, and about 0.5 ft (roughly 10 percent) to canal lining. Water-level declines in the Lower Bridge area have been more or less continuous, with the rate of decline changing with wet and dry climate cycles.

The area extending from Cline Buttes through Redmond, and east to the community of Powell Butte, has seen groundwater-level declines of about 12–14 ft between the mid-1990s and 2008. Of this decline, 7–10 ft (or about 60–70 percent) can be attributed to climate, 2.5–3.5 ft (20–30 percent) to increases in pumping since 1994, and 0.5–1.5 ft (5–10 percent) to canal lining. As with the Lower Bridge area, water levels in Redmond and the surrounding area have exhibited a more or less continual decline, the rate varying with climate cycles.

Spatial analysis of simulation results shows that water level impacts resulting from post-1994 canal lining and increases in pumping extend from the Benham Falls area north to Lower Bridge, and from the Sisters area east to the community of Powell Butte. Outside of this general area of impact, the effects of pumping and canal lining generally are in the range of hundredths to tenths of a foot. Simulated water-level changes match measured declines reasonably well in the northern part of the area of impact, but there is a lack of monitoring in the southern part of the area with which to track water-level changes and verify simulation results.

Acknowledgments

The authors gratefully acknowledge contributions of individuals whose efforts contributed to this report. Critical public-supply water use data were provided by Patrick Griffiths, City of Bend; Jan Wick, Avion Water Company; and Pat Dorning, City of Redmond. Jon Haynes (USGS) compiled water use data and Scott Waibel (USGS) updated and ran the Deep Percolation Model. Dan Polette (USGS) and Ned Gates (OWRD) revisited several of the wells from the earlier study. Kyle Gorman and Jonathan La Marche of OWRD shared their considerable insights into the hydrology and changes in the basin, and provided valuable data on canal lining and land idling.

References Cited

- Bauer, H.H., and Vaccaro, J.J., 1987, Documentation of a deep percolation model for estimating ground-water recharge: U.S. Geological Survey Open-File Report 86-536, 180 p.
- Boyd, T.G., 1996, Groundwater recharge of the middle Deschutes Basin, Oregon: Portland, Oregon, Portland State University, M.S. thesis, 86 p.
- Caldwell, R.R., and Truini, Margot, 1997, Ground-water and water-chemistry data for the upper Deschutes Basin, Oregon: U.S. Geological Survey Open-File Report 97-197, 77 p.
- Gannett, M.W., and Lite, K.E., Jr., 2004, Simulation of regional ground-water flow in the upper Deschutes Basin, Oregon: U.S. Geological Survey Water-Resources Investigations Report 03-4195, 84 p.
- Gannett, M.W., Lite, K.E., Jr., Morgan, D.S., and Collins, C.A., 2001, Ground-water hydrology of the upper Deschutes Basin, Oregon: U.S. Geological Survey Water-Resources Investigations Report 00-4162, 77 p. (Also available at <http://or.water.usgs.gov/pubs/WRIR00-4162/>.)
- Hill, M.C., and Tiedeman, C.R., 2007, Effective groundwater model calibration: Hoboken, New Jersey, John Wiley and Sons, 455 p.
- Luce C.H., and Holden, Z.A., 2009, Declining annual streamflow distributions in the Pacific Northwest United States, 1948–2006: Geophysical Research Letters, v. 36, L161401, doi:10.1029/2009GL039407, 2009, accessed January 5, 2013 at <http://onlinelibrary.wiley.com/doi/10.1029/2009GL039407/abstract>.
- Manga, Michael, 1997, A model for discharge in spring-dominated streams and implications for the transmissivity and recharge of Quaternary volcanics in the Oregon Cascades: Water Resources Research, v. 33, no. 8, p. 1,813–1,822.
- Mayer, T.D., and Naman, S.W., 2011, Streamflow response to climate as influence by geology and elevation: Journal of the American Water Resources Association, v. 47, no. 4, p. 724–738.
- National Agricultural Statistics Service, 2007, Oregon and Washington Cropland Data Layer: National Agricultural Statistics Service, accessed January 5, 2013 at http://www.nass.usda.gov/research/Cropland/metadata/metadata_or07.htm.
- Oregon Water Resources Department, 2013, Water level data and hydrographs: Oregon Water Resources Department, accessed January 8, 2013 at http://www.oregon.gov/owrd/pages/gw/well_data.aspx.
- Sceva, J.E., 1968, Liquid waste disposal in the lava terrane of central Oregon: U.S. Department of the Interior, Federal Water Pollution Control Administration, Technical Projects Branch Report No. FR-4, 66 p., plus a 96 p. appendix.
- Vaccaro, J.J., 2007, A deep percolation model for estimating ground-water recharge—Documentation of modules for the modular modeling system of the U.S. Geological Survey: U.S. Geological Survey Scientific Investigations Report 2006-5318, 30 p.

Publishing support provided by the U.S. Geological Survey
Publishing Network, Tacoma Publishing Service Center

For additional information contact:
Director, Oregon Water Science Center
U.S. Geological Survey
2130 SW 5th Avenue
Portland, Oregon 97201
<http://or.water.usgs.gov>

Water At Home

A snapshot of Bend and Redmond's top water users in 2021

BY HANNA MERZBACH

The Source Weekly requested public records about the largest residential and commercial users in Bend and Redmond. While this picture is still incomplete, it reveals important info about municipal water usage. We aim to shed light on disparate realities in Central Oregon: while some farmers are struggling to make it through the season amid severe drought, some residents are using over 1 million gallons of water a year for lawns.

Across the acres of land surrounding Redmond and Tumalo, residential wells are drying up at alarming rates. Travel north to the Madras region, and farmers are letting their land go fallow amid a shrinking water supply.

But zoom in within city limits in Central Oregon, and residents aren't facing the same constraints. With the worst megadrought the west has seen in at least 1,200 years, the City of Bend and Redmond are urging residents to conserve water, but doing so is voluntary, and not everyone is reducing their use.

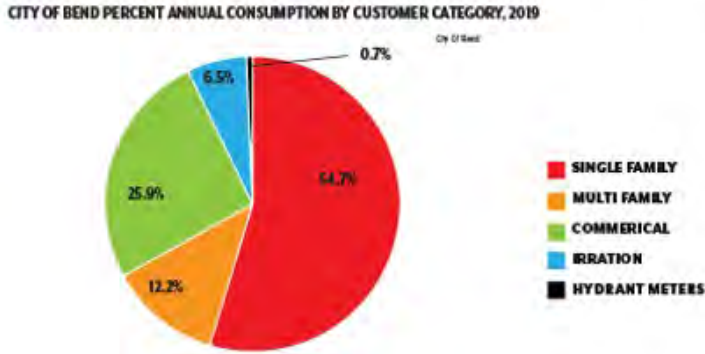
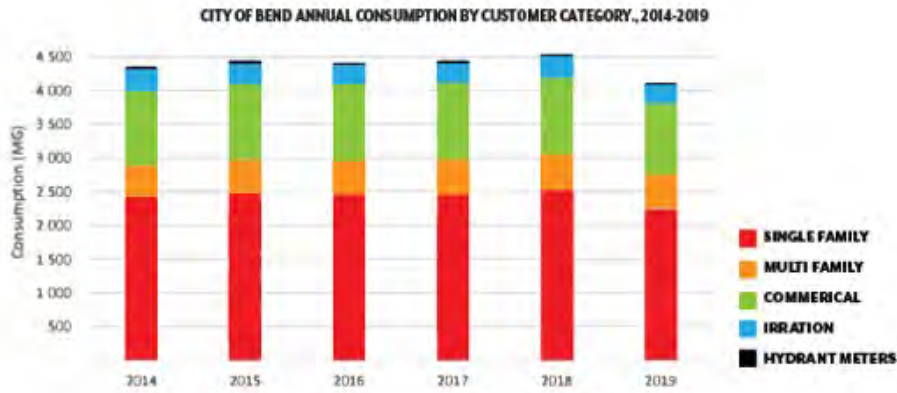


Source Weekly

So, the Source Weekly set out to track where our water is going. We know that about 95% of water in the Upper Deschutes River Basin goes to irrigation, and — with inconsistent metering and canal water seeping into the ground — it's nearly impossible to determine exactly who's using all that water. Instead, we looked toward the remaining 5%, or municipal use, since it's something we can track.

Why does it matter?

In the U.S., households use 29 billion gallons of water daily. Most of that water often goes to lawns and other outdoor uses, yet 50% of that water is wasted, in part, due to overwatering.



City of Bend

This comes as signs of climate change and intensifying drought are striking in every corner of the West. The Colorado River is reaching record lows, threatening the water source for 40 million people. The Great Salt Lake is drying up, leaving ecosystems endangered and creating a bowl of toxic dust around the neighboring city.

Across the West, we're seeing an increased sense of urgency to conserve water. In Central Oregon, for instance, community members are rallying against luxury resorts like Thornburgh, which was originally permitted to use nearly 700 million gallons of water a year. (The developer, Kameron DeLashmutt, said the resort is working to make "substantial reductions" to its use, though it's unclear what these reductions will be.)

PANDA EXPRESS
CHINESE KITCHEN

HOW WE REWARD YOU**

- Medical/dental insurance
- Paid time off
- 401(k) match
- Free meals at work & associate discounts
- Opportunity to serve your community
- Tuition assistance
- Ongoing career & leadership development
- And more

NOW HIRING
for New Bend Location
61165 S Hwy 97

KITCHEN TEAM
\$20.00 - \$23.00 /hr

SERVICE TEAM
\$19.00 - \$23.00 /hr

EARN. GROW. THRIVE.

APPLY TODAY
pandacareers.com

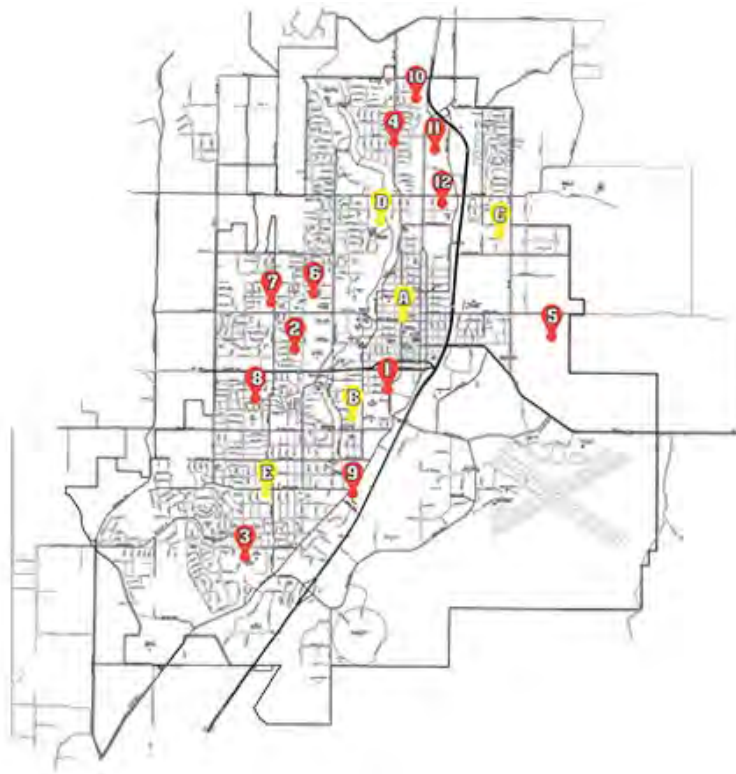
AWAY FROM THE SUN ANNIVERSARY TOUR

3 DOORS DOWN

SPECIAL GUEST
Candlebox

FRIDAY, JULY 28 HAYDEN HOMES AMPHITHEATER

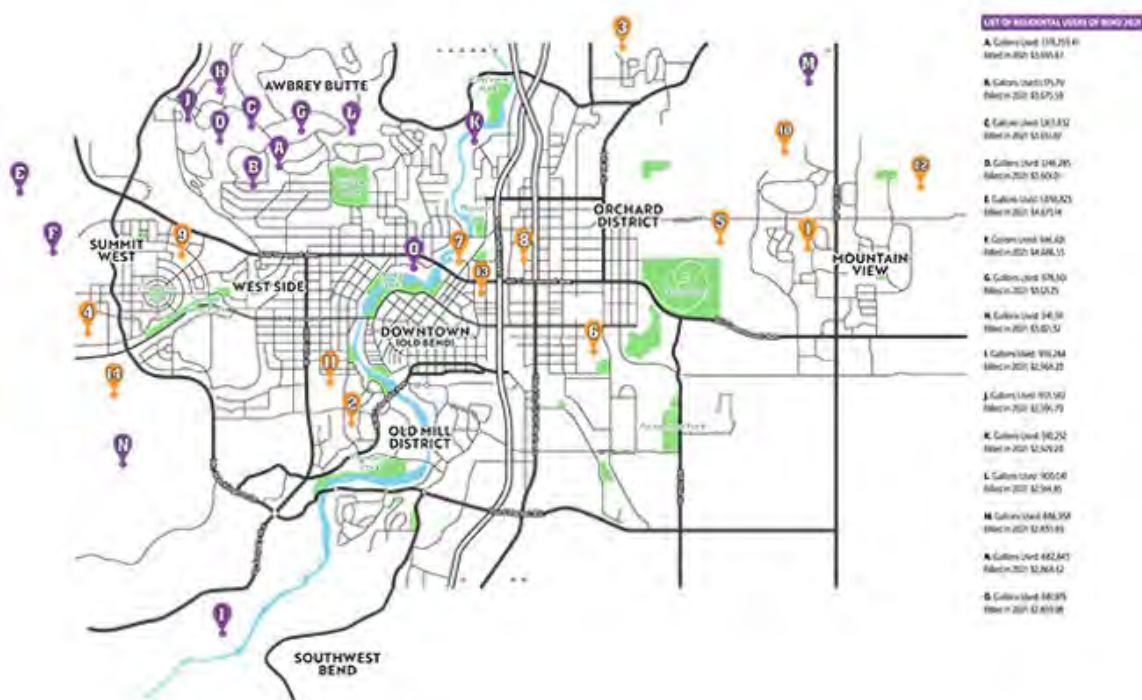
LIVE NATION | **THE LIFE SCREEN** | GREAT SEAT



Source Weekly

Meanwhile, farmers continue to suffer and worry they won't make it through the season. A lot of this comes down to Oregon's water law system, which experts across the region have deemed "archaic." But making institutional change is a slow process. Limiting municipal water use won't do much for the dire situations farmers face, but it could help build "a culture of conservation" and eventually lead to more structural change, according to Tod Heisler, a longtime Deschutes River advocate.

"We want to start with the people who will accept some of this change and ownership," Heisler said, "and then start working outward to everybody else."



Big Takeaways

In 2021, Bend Waters's top residential customer used 10 times as much water as the city's average residential customer. The top customer used 1,176,259 gallons of water. That's enough to fill more than 32 football fields. Meanwhile, the average Bend Water customer used 114,456 gallons — or three football fields.

Most of the City of Bend's largest residential water users live on Awbrey Butte and the west side of town. Eight of the 15 top Bend Water users live on Awbrey Butte. One lives next to Mirror Pond. Another lives in Tetherow. The only top user east of Highway 97 lives near Pine Nursery Park. Google Maps shows that many of these properties have large green lawns.

***It's important to note that this is an incomplete picture, as Avion serves a lot of the larger properties on the east side of town, which could have made this list.

Bend's top residential customers use more water than Redmond's. The City of Bend had five customers using over one million gallons of water in 2021. Redmond only had one. Interestingly, Bend's top users do pay about twice as much as Redmond's top users. According to Michael Buettner, Bend's utility director, this is likely because Bend's water system is more complex and costlier to maintain than Redmond's.

Most of Bend and Redmond's largest commercial users are schools and hospitals — but breweries, labs and one car wash also made the list. Schools use water to irrigate lawns and athletic fields, and their usage largely correlates with the size of their green space. For St. Charles, Bend's largest user at 43 million gallons a year, water is critical for patient care, according to the hospital's spokesperson. Next up is Deschutes Brewery, which used 34 million gallons, since water is the main ingredient in beer. 10 Barrel and Humm Kombucha also rank in the top commercial users. Manufacturing hubs like Lonza and SiCamore Semi follow. And don't forget Redmond's Surf Thru Express Car Wash and Walmart Supercenter, which used 7.5 and 7.3 million gallons of water, respectively.

***The Bend Parks & Recreation District didn't make this list because it has multiple water providers, and the city only serves water to some of the smaller parks in town. According to Buettner, if looked at in aggregate, the parks would likely be in the city's top five water users.



River's Edge Golf Course used nearly twice as much water as St. Charles in Bend. The golf course — located off Mt. Washington Drive — used nearly 82 million gallons, compared to St. Charles' 43 million. Even at 82 million, River's Edge only used about half of the water it's allowed to divert out of the Deschutes River, according to the Central Oregon Irrigation District, which serves the golf course its water. The region's golf courses and resorts

largely use groundwater through their own water rights, making it difficult to determine how much water they used. River's Edge is one of the only golf courses required to report its consumption, since it diverts water from the river.

MAP OF RESIDENTIAL AND COMMERCIAL USERS OF REDMOND 2021



Source Weekly

How to reduce your water use:


- If you're a Bend Water customer, sign up for [WaterSmart](#), where you can track your water use and sign up for leak alerts.
- Buy Energy-Star certified appliances, which can save you water and money.
- Use xeriscaping or a water-wise landscaping plan.
- Water outdoor areas in the early morning or evenings to beat daytime evaporation.
- Update your sprinkler system, making sure you're watering the lawn, not the sidewalk and driveway. Bend Water customers can request a [free sprinkler inspection](#) through September.

Our methodology

The Source Weekly started by requesting public records of 2021's top residential water users from Bend and Redmond's largest water utilities: Bend Water, Redmond Water and Avion Water Company. Roats Water System also serves Bend customers, but the Source didn't seek records from the company since it serves a small percentage of the city's population.



“I know there's a general interest in the public to have a transparent understanding of what's happening in the water world, and we support that here.” —Michael Buettner, Bend utility director

tweet this 

The Source Weekly received records from the city-run utilities, Bend and Redmond Water, but we soon hit a snag when Avion denied our requests, arguing that since it is a private company, it isn't subject to public record law. The Source Weekly appealed this decision to Deschutes District Attorney John Hummel, since water itself is public in Oregon, and Hummel decided that Avion is the "functional equivalent" of a public body, and thus subject to public records law.

He added in his May 26 decision, "We're in the West, we're in a drought, and this request relates to water usage."

Avion had two choices: it could either provide the records or take the Source Weekly to court. The company chose the latter, and — with litigation ongoing — we're unlikely to see those records for months. The Source isn't alone in this kind of lawsuit: after the Oregonian tried to get water use data about the Google data center in The Dalles, the city decided to sue to keep the records private.

In Central Oregon, we were left with an incomplete picture of residential water usage, since Avion serves roughly 15% of Bend, including the fast-growing developments on the north and east sides of town. Even though the company operates through a franchise agreement with the city of Bend, city officials are in the dark about how much water Avion customers are using.

And with the city growing largely in the parts Avion serves, public records from the city offer us a limited view of water consumption. Bend Water officials told the Source that, as the city's population doubled over the last two decades, water consumption stayed largely the same thanks to metering and greater conservation measures. And, on Aug. 3, the public utility told the city council that — as of July 31 — water consumption was down this year, compared to previous years. But, none of this factors in data about the large swaths of town that Avion serves.

"I know there's a general interest in the public to have a transparent understanding of what's happening in the water world, and we support that here," Buettner, the Bend utility director, told the Source. "We obviously can't make other people share their data. But we're curious (about Avion's data) as well."

Avion did not respond to requests to comment.

Without information about nearly a fifth of Bend's population, we deemed it unfair to publish the names and exact addresses of top users, as we'd originally planned. (We were also unable to determine to what extent leaks factored into water use.) Our approach to this story was similar to what other newspapers, including Willamette Week in Portland, have done when they gain public records and then publish the names and addresses of the top water users in their areas. If we obtain records from Avion, we plan to publish names and addresses of the top users.

Instead, we offer readers a map of where some of the largest water users live, how much water they used in 2021 and how much they spent. We put this side-by-side with commercial data, in order to start to fill in that water use picture. We also gained some information about golf courses like River's Edge from irrigation districts. This story is by no means comprehensive and doesn't touch on specific developments, resorts and cities like Sisters and Prineville, but it's a start at offering a snapshot of where our water is going.

Related



Water Woes for Farmers:

Drought and river conservation measures have left Central Oregon farmers with less water — though some are harder hit than others.

Related



The Well's Run Dry:

With the ongoing drought, growing population and piping of canals, Central Oregonians are increasingly seeing their wells go dry. Many may be out of luck.

SOURCE WEEKLY



**CASCADES
READER**

bend nest
parenting magazine



LAY IT OUT EVENTS

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Fri, 20 May 2022 15:48:51 -0700
To: Nicole Vulcan <nicole@bendsource.com>
Subject: Fwd: Source Weekly inquiry about Bend's biggest water users
Attachments:
· Top 15 SFR Customers 2021.xlsx (27 kb)
· image008.png (8 kb)

Got the goods -- see attached spreadsheet.

----- Forwarded message -----

From: Michael Buettner <mbuettner@bendoregon.gov>
Date: Fri, May 20, 2022 at 3:41 PM
Subject: RE: Source Weekly inquiry about Bend's biggest water users
To: Hanna Merzbach <merzbachhanna@gmail.com>
Cc: Robyn Christie <rchristie@bendoregon.gov>, CommunicationsShared <communications@bendoregon.gov>

Hi Hannah – I've attached the top 15 single family residential customers per your request.

This includes the service addresses and monthly consumption in gallons. The Amount Billed rows include volume charges for water plus the recurring monthly base charges and fees.

Please let me know if you have any follow up questions.

Thx.

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Friday, May 20, 2022 2:04 PM
To: Michael Buettner <mbuettner@bendoregon.gov>
Cc: Robyn Christie <rchristie@bendoregon.gov>; CommunicationsShared <communications@bendoregon.gov>
Subject: Re: Source Weekly inquiry about Bend's biggest water users

Hi all,

I wanted to check in about those records I requested. I'm wondering if it's possible to rescope my request to focus on **residential** urban water users -- I'm realizing that many of the top users will be schools and hospitals, and we don't want to focus too much on them. Let me know what you need

from me in order to make that shift.

Thank you!

[Redacted]

On Mon, May 16, 2022 at 5:34 PM Michael Buettner <mbuettner@bendoregon.gov> wrote:

Hi there – We do not have direct access to Avion or Roats water use data. The data we do have on hand would be related to their winter water use. We request that once per year to calculate sewer billing for customers that receive sewer service from the City of Bend, but water from Avion or Roats. We usually request December through February.

Thx.

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Monday, May 16, 2022 10:12 AM
To: Michael Buettner <mbuettner@bendoregon.gov>
Cc: Robyn Christie <rchristie@bendoregon.gov>; CommunicationsShared <communications@bendoregon.gov>
Subject: Re: Source Weekly inquiry about Bend's biggest water users

Hi all,

I just wanted to follow up about my previous question about Avion Water. I found records that the city does indeed have agreements with Avion allowing the company to provide water. Does the city have access to their user data, and is this something I can add to my request?

Let me know -- thanks so much!

[Redacted]

On Thu, May 12, 2022 at 2:50 PM Hanna Merzbach <merzbachhanna@gmail.com> wrote:

Hi there,

In the meantime, I have a quick question: does the city contract with Avion Water to also provide services? If so, does the city have access to their user data? Since they are a private company, it's a bit trickier to get their records.

Thanks!

On Thu, May 12, 2022 at 1:01 PM Hanna Merzbach <merzbachhanna@gmail.com> wrote:

Perfect -- thanks so much, Michael!

On Thu, May 12, 2022 at 12:13 PM Michael Buettner <mbuettner@bendoregon.gov> wrote:

OK thanks for the update. Our staff are pulling this data together this week and I should have something for you by May 20th at the latest.

Thx.

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Thursday, May 12, 2022 10:32 AM
To: Michael Buettner <mbuettner@bendoregon.gov>
Cc: Robyn Christie <rchristie@bendoregon.gov>; CommunicationsShared <communications@bendoregon.gov>
Subject: Re: Source Weekly inquiry about Bend's biggest water users

Hi all,

Since I am tight on time before my deadline, I went ahead and submitted my records request for the water user data, along with a request for a fee waiver, since this story is in the public's interest.

Please let me know if you have any questions -- thanks!



On Wed, May 11, 2022 at 10:30 AM Hanna Merzbach <merzbachhanna@gmail.com> wrote:

Hi Michael,

Thanks so much for getting back to me. Sorry for the delay -- it took a couple days to confirm the direction of the story. I have the following answers to your questions:

1. While I understand that agricultural users are the largest water users in the Deschutes Basin, I am interested in getting data on urban water users (residents and businesses alike), since with the drought, we feel it's imperative to keep our urban water guzzlers accountable. (We are hoping to produce a story similar to Willamette Week's "[Water Hogs](#)" tradition.) I hope to request these records from the largest water systems, including Bend Water, Redmond Water and Avion.

2. It is my understanding that, while ORS 192.355(28) may exempt people's names from public record requests, it does not exempt addresses. The state ordinance exempts the following: "Personally identifiable information about customers of a municipal electric utility or a people's utility district or the names, dates of birth, driver license numbers, telephone numbers, electronic mail addresses or Social Security numbers of customers who receive water, sewer or storm drain services from a public body as defined in ORS 174.109." The [2007 Water Hogs article](#) also confirms that while the state legislature passed this bill in 2005 allowing water companies to keep names secret, addresses are still fair game (see subhead: "Doused in data").

I can confer with the Oregon [Public Records Advocate](#) if you'd like to make sure addresses are alright to release. **I would ideally like to request the addresses of the top 15 water users in Bend from 2021, as well as the amount they spent on water and the number of gallons they consumed.**

3. Thank you for providing the link to the Deschutes Basin study -- that will be very helpful for our research. I plan to feature a few agricultural users really feeling the effects of the drought, as we feel it's imperative to contrast these two extremes in Deschutes County.

Next Steps:

Feel free to give me a call at 818-415-3506 if you'd like to discuss all this more. If you are ready to move forward, I can send over a formal public records request. We are ideally hoping to get these records by the end of May at the latest.

Thank you again for your help!

On Fri, May 6, 2022 at 5:09 PM Michael Buettner <mbuettner@bendoregon.gov> wrote:

Hi Hannah – I am happy to work with you to provide what information I can regarding water use in Bend.

A couple of clarifying questions:

1. Are you interested in urban water users (residences, businesses, etc.) or are you interested in irrigation districts and agricultural water users? The largest water users in and around Bend are agricultural users and receive water from irrigation districts. If the focus is on quantity of water in the basin and largest users I recommend skimming through the [Upper Deschutes Basin Study](#) for greater context. It has a lot of great information about who uses what in the larger basin.
2. Our staff can provide customer water use data from the City's water utility, but only to a point. ORS 192.355(28) exempts much of the personally identifiable information from public records requests. However, we can aggregate water use data into customer groups that will be able to point out where the largest types of uses are in the urban environment – landscape irrigation of home predominantly. There's a ton of information at our www.bendoregon.gov/water-system-planning page that came from our most recent Water Management and Conservation Plan.
3. Regarding those feeling the effects of drought the most – that will probably be an agricultural customer that has had water deliveries cut back due to lack of water supply. Most urban customers (City of Bend, Avion, Roats, Redmond, Sisters) are part of water systems that can attenuate for the impacts of drought year to year. We're feeling effects, but nothing near what Ag customers are feeling.

Feel free to give me a call and discuss what data could be packaged up best for this effort.

Thx.

Mike Buettner | Utility Director - [OneWater - he/his/him](#)

O: 541.388.5569 | M: 541.213.1911



From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Thursday, May 5, 2022 8:32 AM
To: CommunicationsShared <communications@bendoregon.gov>
Cc: Robyn Christie <rchristie@bendoregon.gov>; Michael Buettner <mbuettner@bendoregon.gov>
Subject: Re: Source Weekly inquiry about Bend's biggest water users

Hi there,

Thanks so much, Anne. I'll wait to see what the utilities folks have to say before I send over a records request.

Talk soon!



On Wed, May 4, 2022 at 10:33 PM CommunicationsShared <communications@bendoregon.gov> wrote:

Hi Hanna,

Feel free to reach out to me directly if you ever need help!

Public records requests typically go to Robyn Christie rchristie@bendoregon.gov but I'll send this over to our utilities folks to see if they have this data handy.

Anne

Anne Aurand | Communications Director

My Pronouns: She, Her [Why pronouns?](#)

Office: 541-388-5573



Sign up for our newsletter at www.bendoregon.gov/enews.

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Tuesday, May 3, 2022 2:25 PM
To: CommunicationsShared <communications@bendoregon.gov>
Subject: Source Weekly inquiry about Bend's biggest water users

CAUTION: External Email. Use caution when opening attachments, clicking links, or responding to this email.

Hi there,

I'm a Bend-based independent journalist, and I'm writing a feature for the Source about Central Oregon's biggest water users and the people most feeling the effects of the drought.

I'm wondering if you can suggest how I can get records of the 10 entities that use the most water in the City of Bend. I'd love to do this without putting in a record request, but please let me know if one will be needed.

I'm hoping to get this list by the end of May, at the latest.

Thanks so much!

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

PUBLIC RECORDS LAW DISCLOSURE: Emails are generally public records and therefore subject to public disclosure unless exempt from disclosure under Oregon Public Records Law. Emails can be sent inadvertently to unintended recipients and contain confidential or privileged information. If you are not the intended recipient (or authorized to receive for the recipient), please advise by return email and delete immediately without reading or forwarding to others. Thank you.

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

PUBLIC RECORDS LAW DISCLOSURE: Emails are generally public records and therefore subject to public disclosure unless exempt from disclosure under Oregon Public Records Law. Emails can be sent inadvertently to unintended recipients and contain confidential or privileged information. If you are not the intended recipient (or authorized to receive for the recipient), please advise by return email and delete immediately without reading or forwarding to others. Thank you.

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

PUBLIC RECORDS LAW DISCLOSURE: Emails are generally public records and therefore subject to public disclosure unless exempt from disclosure under Oregon Public Records Law. Emails can be sent inadvertently to unintended recipients and contain confidential or privileged information. If you are not the intended recipient (or authorized to receive for the recipient), please advise by return email and delete immediately without reading or forwarding to others. Thank you.

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

PUBLIC RECORDS LAW DISCLOSURE: Emails are generally public records and therefore subject to public disclosure unless exempt from disclosure under Oregon Public Records Law. Emails can be sent inadvertently to unintended recipients and contain confidential or privileged information. If you are not the intended recipient (or authorized to receive for the recipient), please advise by return email and delete immediately without reading or forwarding to others. Thank you.

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

PUBLIC RECORDS LAW DISCLOSURE: Emails are generally public records and therefore subject to public disclosure unless exempt from disclosure under Oregon Public Records Law. Emails can be sent inadvertently to unintended recipients and contain confidential or privileged information. If you are not the intended recipient (or authorized to receive for the recipient), please advise by return email and delete immediately without reading or forwarding to others. Thank you.

--

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Wed, 25 May 2022 11:52:55 -0700
To: Nicole Vulcan <nicole@bendsource.com>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

On Wed, May 25, 2022 at 11:21 Nicole Vulcan <nicole@bendsource.com> wrote:

-Nicole Vulcan

Editor, [Source Weekly](#)

Bend & Central Oregon's locally owned, indie newspaper since 1997

Get news delivered to your inbox through the [Cascades Reader](#), our daily newsletter.

100% local. No paywalls. Support our mission to bring local journalism to Central Oregon by becoming a [Source Insider](#).

C: 971-276-7720

O: 541-383-0800

[Facebook.com/SourceWeekly](#)

Twitter [@SourceWeekly](#)

Instagram [@SourceWeekly](#) / [@micavve1](#)

From: Hanna Merzbach <merzbachhanna@gmail.com>
Date: Tuesday, May 24, 2022 at 11:29 AM
To: Nicole Vulcan <nicole@bendsource.com>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

On Mon, May 23, 2022 at 4:34 PM Hanna Merzbach <merzbachhanna@gmail.com> wrote:

----- Forwarded message -----

From: Kelly Morse <Kelly.Morse@redmondoregon.gov>
Date: Mon, May 23, 2022 at 16:21
Subject: RE: Source Weekly inquiry about Redmond's biggest water users
To: Hanna Merzbach <merzbachhanna@gmail.com>

That's definitely manageable. I'd be willing to comp my time so estimate would be reduced to \$36.23. If you agree to move forward, I can work on reaching out to the 5 users this week since the number is much smaller.

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Monday, May 23, 2022 4:16 PM
To: Kelly Morse <Kelly.Morse@redmondoregon.gov>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is safe.

How about the top 5 users?

On Mon, May 23, 2022 at 16:05 Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hi,

The City Attorney advised me to reach out to them so they are aware of the request and to see if they will consent to the release of their names. I suspect none of the residential customers will want to do that, similar to the last request...RSD was the only one to consent.

The time to pull the report and filter out the commercial accounts is 1 hour so there is not adjustment there. To reduce my time, you could reduce the number from 15 to something more manageable.

Thank you,

Kelly

KELLY MORSE | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350-9614

email kelly.morse@redmondoregon.gov

411 SW 9th Street Redmond, Oregon 97756

Online at WWW.REDMONDOREGON.GOV

From: Hanna Merzbach <merzbachhanna@gmail.com>

Sent: Monday, May 23, 2022 3:06 PM

To: Kelly Morse <Kelly.Morse@redmondoregon.gov>

Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kelly,

Thanks for your response and for working with me on this. Why is it that you need to contact each customer? The Oregon Public Records Advocate advised Bend Water on this, and he said that public utility departments are able to release street addresses of customers and should just check each user's account to see if they requested the department withhold their info for safety concerns (see attached email). I don't believe you are legally obligated to contact the customers.

I'm just looking for any way to bring that \$ amount down, since the Source doesn't have the budget for that. Are you willing to reconsider our fee waiver request, since we are arguing a story like this in the public's interest?

Thanks so much!

On Mon, May 23, 2022 at 2:52 PM Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hi Hanna,

The Billing & Collections Manager is estimating 1 hour to pull this report. I've asked why the increase in time and am just waiting to hear back from her. There would also be 1.5 hours of my time to contact each customer per our City Attorney.

The estimate is currently at 2.5 hrs at \$36.23/hr or \$90.57.

If you opt to move forward with this request, it will likely be next week before I can reach out to the customers.

Thank you,

Kelly

KELLY MORSE | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350-9614

email kelly.morse@redmondoregon.gov

411 SW 9th Street Redmond, Oregon 97756

Online at WWW.REDMOND.OREGON.GOV

From: Hanna Merzbach <merzbachhanna@gmail.com>

Sent: Monday, May 23, 2022 9:15 AM

To: Kelly Morse <Kelly.Morse@redmondoregon.gov>

Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kelly,

I wanted to check in about what would be needed to get those additional residential water use records. I'm going to be out of service for a couple days starting Wednesday, so I'd love to get this figured out before then.

Thanks so much!

On Fri, May 20, 2022 at 2:26 PM Hanna Merzbach <merzbachhanna@gmail.com> wrote:

That sounds good -- I'll plan to check in on Monday. Thanks, Kelly!

On Fri, May 20, 2022 at 2:25 PM Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hi Hanna,

I was on another line so I apologize for missing your call. The Billing & Collections Manager is out of the office this afternoon, but I can check with her on Monday. There would likely be additional charges, similar to this request.

Thank you,

Kelly

KELLY MORSE | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350-0614

email kelly.morse@redmondoregon.gov

411 SW 9th Street Redmond, Oregon 97756
Online at WWW.REDMONDOREGON.GOV

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Friday, May 20, 2022 2:02 PM
To: Kelly Morse <Kelly.Morse@redmondoregon.gov>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kelly,

Thanks so much for sending this all my way. I just left you voicemail. I'm wondering what it would take to rescope the records to just show residential users (exempting HOAs) -- we would rather not focus our story on schools and hospitals.

Let me know what you need from me to move forward.

Thanks so much!

On Fri, May 20, 2022 at 12:33 PM Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hi Hanna,

Attached is the information you requested, the finalized request form, and receipt for payment.

To add some perspective, the accounts on NE 5th Street and Cliffside Way are both Homeowners Associations who divide the charges listed amongst their owners. The Redmond School District is the only account that gave consent to release their name, but asked that we include the acreage info they supplied.

Unless you have any questions, I will consider this request closed.

Thank you,

Kelly

KELLY MORSE | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350-9614

email kelly.morse@redmondoregon.gov

411 SW 9th Street Redmond, Oregon 97756
Online at WWW.REDMONDOREGON.GOV

From: Kelly Morse
Sent: Friday, May 20, 2022 11:33 AM
To: Hanna Merzbach <merzbachhanna@gmail.com>
Subject: RE: Source Weekly inquiry about Redmond's biggest water users

I'm in a meeting, but once I'm done, I'll forward the info. Thanks Hanna.

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Friday, May 20, 2022 11:27 AM
To: Kelly Morse <Kelly.Morse@redmondoregon.gov>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kelly,

Thanks for this -- I believe my editor, Nicole Vulcan, gave you a call to pay for this. Let me know if you need anything else from me!

On Fri, May 20, 2022 at 9:37 AM Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hi Hanna,

Attached is an estimate for your records request. If you opt to move forward, once payment is received, I can email you the data right away.

Thank you,

Kelly

KELLY MORSE | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350-9614

email kelly.morse@redmondoregon.gov

411 SW 9th Street Redmond, Oregon 97756
Online at WWW.REDMONDOREGON.GOV

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Tuesday, May 17, 2022 11:57 AM
To: Kelly Morse <Kelly.Morse@redmondoregon.gov>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Both would be great.

Thanks, Kelly!

On Tue, May 17, 2022 at 11:56 AM Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hello again,

One more clarification...

Your request asks for the amount each user spent on water. Are you looking for only the consumption costs for these users or do you want the water meter charge included too?

Thank you,

Kelly

KELLY MORSE | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350-9614

email kelly.morse@redmondoregon.gov

411 SW 9th Street Redmond, Oregon 97756
Online at WWW.REDMONDOREGON.GOV

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Thursday, May 12, 2022 4:54 PM
To: Kelly Morse <Kelly.Morse@redmondoregon.gov>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kelly,

Let's start with your top 15 overall users.

Thanks!

On Thu, May 12, 2022 at 4:34 PM Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hi Hanna,

The City of Redmond is in receipt of your public records request for information on the top 15 urban water users for 2021, consumption and costs paid. To clarify "urban" water users, are you looking for residential customers only or our top 15 users whether they are a residential or commercial?

Our City Attorney is out of the office the remainder of this week. Once he has an opportunity to review your fee waiver request, I'll let know.

In the meantime, if you have any questions, please let me know.

Thank you,

Kelly



KELLY MORSE, MMC | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350.9614

ymail kelly.morse@redmondoregon.gov

[411 SW 9th Street Redmond, Oregon 97756](#)



WWW.REDMONDOREGON.GOV

Please consider the environment before printing this email.

DISCLOSURE NOTICE: Messages to and from this email address may be subject to Oregon Public Records Law.

From: Hanna Merzbach <merzbachhanna@gmail.com>

Sent: Thursday, May 12, 2022 10:26 AM

To: Kelly Morse <Kelly.Morse@redmondoregon.gov>

Cc: Joshua Wedding <Joshua.Wedding@redmondoregon.gov>; Dustan Campbell <Dustan.Campbell@redmondoregon.gov>

Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content is

Hi there,

I have attached my record request form, along with a letter further explaining my request and asking for a fee waiver. As stated in the letter, Oregon public record law requires these records be sent by June 1, but I would appreciate them by May 20, to give me time before my deadline.

Let me know if you have any questions -- thanks!

On Wed, May 11, 2022 at 3:45 PM Kelly Morse <Kelly.Morse@redmondoregon.gov> wrote:

Hi Hanna,

In case you don't have our request form, it is attached.

Thank you,

Kelly



KELLY MORSE, MMC | City of Redmond

City Recorder

she • her • hers

phone 541.923.7751

cell 541.350.9614

email kelly.morse@redmondoregon.gov

[411 SW 9th Street](#) Redmond, Oregon 97756



WWW.REDMONDOREGON.GOV

Please consider the environment before printing this email.

DISCLOSURE NOTICE: Messages to and from this email address may be subject to Oregon Public Records Law.

From: Hanna Merzbach <merzbachhanna@gmail.com>
Sent: Wednesday, May 11, 2022 3:18 PM
To: Joshua Wedding <Joshua.Wedding@redmondoregon.gov>
Cc: Kelly Morse <Kelly.Morse@redmondoregon.gov>; Dustan Campbell <Dustan.Campbell@redmondoregon.gov>
Subject: Re: Source Weekly inquiry about Redmond's biggest water users

[EXTERNAL]: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the content.

Great – I'll send over a request tomorrow. Thanks!

On Wed, May 11, 2022 at 3:10 PM Joshua Wedding <Joshua.Wedding@redmondoregon.gov> wrote:

We do keep track of all of our water accounts.



JOSH WEDDING

Water Utilities Manager | City of Redmond

phone 541.504-2022

cell 541.948-7956

email Joshua.wedding@redmondoregon.gov

[243 E. Antler Ave. Redmond, OR 97756](#)

Hanna Merzbach | Journalist

Pronouns: she/her

Follow me on [Twitter](#) or connect on [LinkedIn](#).

hannamerzbach.com

Current time zone: PST

Phone: +1 (818) 415-3506



Search EPA.gov

- Environmental Topics
- Laws & Regulations
- Report a Violation
- About EPA

[CONTACT US](#)

Water Systems Search Results

Related Topics: [EPA Home](#) » [Your Drinking Water](#) » [SDWIS Federal Reports Search](#) » Water System Search Results

Report Filters [< Return to SDWIS Search](#)

Submission Year is **2023** and Quarter is **2** and Primacy Agency in **(OR)** and Activity Status is **A**

Search: Go

Rows: 20 Actions

Filter Report | Select Columns | Reset Report | Download Report | Help

Row text contains 'BEND WATER DEPARTMENT'

1 - 1 of 1

PWS ID	PWS Name		PWS Type [↑]		Primary Source	Counties Served	Cities Served
OR4100100	BEND WATER DEPARTMENT	Community water system	Surface water	Deschutes	-	68,538	57

							68,538		
1 - 1 of 1									

Report runtime 0.61 seconds.

[Contact Us](#) to ask a question, provide feedback, or report a problem.



Discover.

- [Accessibility](#)
- [Budget & Performance](#)
- [Contracting](#)
- [EPA www Web Snapshot](#)
- [Grants](#)
- [No FEAR Act Data](#)
- [Plain Writing](#)
- [Privacy](#)
- [Privacy and Security Notice](#)

Connect.

- [Data.gov](#) [EXIT](#)
- [Inspector General](#)



Search EPA.gov

- [Environmental Topics](#) ▾
- [Laws & Regulations](#) ▾
- [Report a Violation](#) ▾
- [About EPA](#) ▾

[CONTACT US](#)

Water Systems Search Results

Related Topics: [EPA Home](#) » [Your Drinking Water](#) » [SDWIS Federal Reports Search](#) » Water System Search Results

Report Filters [< Return to SDWIS Search](#)

Submission Year is **2023** and Quarter is **2** and Primacy Agency in **(OR)** and Activity Status is **A**

Q ▾

Rows ▾ ▾

1 - 16 of 16

PWS ID	PWS Name		PWS Type [↑] ≡		Primary Source	Counties Served	Cit Ser	
OR4101506	AVION WC - BRASADA RANCH	Community water system	Ground water	Crook	-	1,200	7	16

OR4100094	AVION WC - CHAPARRAL	Community water system	Ground water	Deschutes	-	470	8	33
OR4100122	AVION WC - CINDER BUTTE ESTS	Community water system	Ground water	Deschutes	-	110	5	5
OR4101259	AVION WC - DESERT SPRINGS	Community water system	Ground water	Deschutes	-	130	3	61
OR4101366	AVION WC - DRID	Community water system	Ground water	Deschutes	-	55	5	23
OR4100091	AVION WC - GREATER AVION	Community water system	Ground water	Deschutes	-	32,265	31	165
OR4101346	AVION WC - HIGHLAND ESTATES	Community water system	Ground water	Deschutes	-	75	4	27
OR4101382	AVION WC - ODIN FALLS RANCH	Community water system	Ground water	Deschutes	-	110	3	2
OR4101203	AVION WC - RED CLOUD	Community water system	Ground water	Crook	-	585	12	6
OR4101230	AVION WC - SOUTH REDMOND HEIGHTS	Community water system	Ground water	Deschutes	-	175	6	32
OR4101305	AVION WC - SQUAW CREEK CANYON	Community water system	Ground water	Deschutes	-	408	8	32
OR4101160	AVION WC - TETHEROW CROSSING	Community water system	Ground water	Deschutes	-	175	7	6
OR4101351	AVION WC - TUMALO RIM	Community water system	Ground water	Deschutes	-	145	5	27
OR4101155	AVION WC - TUSCARORA	Community water system	Ground water	Deschutes	-	117	3	4
OR4100975	AVION WC - WILD RIVER	Community water system	Ground water	Deschutes	-	276	7	18

OR4105069	AVION WC-TURNER	Community water system	Ground water	Deschutes	-	35	4	1
						36,331		
1 - 16 of 16								

Report runtime 0.61 seconds.

[Contact Us](#) to ask a question, provide feedback, or report a problem.



Discover.

- [Accessibility](#)
- [Budget & Performance](#)
- [Contracting](#)
- [EPA www Web Snapshot](#)
- [Grants](#)
- [No FEAR Act Data](#)
- [Plain Writing](#)
- [Privacy](#)
- [Privacy and Security Notice](#)

Connect.

- [Data.gov](#) [EXIT](#)
- [Inspector General](#)
- [Jobs](#)
- [Newsroom](#)
- [Open Government](#)
- [Regulations.gov](#) [EXIT](#)
- [Subscribe](#)
- [USA.gov](#) [EXIT](#)
- [White House](#)



Search EPA.gov

- [Environmental Topics](#) ✓
- [Laws & Regulations](#) ✓
- [Report a Violation](#) ✓
- [About EPA](#) ✓

[CONTACT US](#)

Water Systems Search Results

Related Topics: [EPA Home](#) » [Your Drinking Water](#) » [SDWIS Federal Reports Search](#) » [Water System Search Results](#)

Report Filters [< Return to SDWIS Search](#)

Submission Year is **2023** and Quarter is **2** and Primacy Agency in **(OR)** and Activity Status is **A**

Q ✓ Go

Rows Actions ✓

Filter Report | Select Columns | Reset Report | Download Report | Help

✕

1 - 2 of 2

PWS ID	PWS Name		PWS Type ↑≡			Primary Source	Counties Served	Cities Served
OR4100113	ROATS WATER SYSTEM	Community water system	Ground water	Deschutes	-	5,727	16	15

OR4100115	ROATS WOODSIDE RANCH WS	Community water system	Ground water	Deschutes	-	1,555	10	9
						7,282		
1 - 2 of 2								

Report runtime 0.61 seconds.

[Contact Us](#) to ask a question, provide feedback, or report a problem.



Discover.

- [Accessibility](#)
- [Budget & Performance](#)
- [Contracting](#)
- [EPA www Web Snapshot](#)
- [Grants](#)
- [No FEAR Act Data](#)
- [Plain Writing](#)
- [Privacy](#)
- [Privacy and Security Notice](#)

Connect.


- [Data.gov](#) [EXIT](#)
- [Inspector General](#)



QuickFacts
Bend city, Oregon

QuickFacts provides statistics for all states and counties, and for cities and towns with a *population of 5,000 or more*.

Table


All Topics 	Bend city, Oregon
Population Estimates, July 1, 2022, (V2022)	103,254
PEOPLE	
Population	
Population Estimates, July 1, 2022, (V2022)	103,254
Population estimates base, April 1, 2020, (V2022)	▲ 99,213
Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)	▲ 4.1%
Population, Census, April 1, 2020	99,178
Population, Census, April 1, 2010	76,639
Age and Sex	
Persons under 5 years, percent	▲ 5.8%
Persons under 18 years, percent	▲ 22.4%
Persons 65 years and over, percent	▲ 16.1%
Female persons, percent	▲ 50.1%
Race and Hispanic Origin	
White alone, percent	▲ 89.6%
Black or African American alone, percent (a)	▲ 0.8%
American Indian and Alaska Native alone, percent (a)	▲ 0.4%
Asian alone, percent (a)	▲ 1.7%
Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ 0.1%
Two or More Races, percent	▲ 5.6%
Hispanic or Latino, percent (b)	▲ 8.6%
White alone, not Hispanic or Latino, percent	▲ 84.2%
Population Characteristics	
Veterans, 2017-2021	5,287
Foreign born persons, percent, 2017-2021	5.4%
Housing	
Housing units, July 1, 2022, (V2022)	X
Owner-occupied housing unit rate, 2017-2021	61.3%
Median value of owner-occupied housing units, 2017-2021	\$462,400
Median selected monthly owner costs -with a mortgage, 2017-2021	\$1,954
Median selected monthly owner costs -without a mortgage, 2017-2021	\$581
Median gross rent, 2017-2021	\$1,531
Building permits, 2022	X
Families & Living Arrangements	
Households, 2017-2021	40,158
Persons per household, 2017-2021	2.40
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	81.3%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	8.8%
Computer and Internet Use	
Households with a computer, percent, 2017-2021	96.5%
Households with a broadband Internet subscription, percent, 2017-2021	92.3%
Education	
High school graduate or higher, percent of persons age 25 years+, 2017-2021	95.5%
Bachelor's degree or higher, percent of persons age 25 years+, 2017-2021	46.6%

Health	
With a disability, under age 65 years, percent, 2017-2021	6.4%
Persons without health insurance, under age 65 years, percent	▲ 8.8%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2017-2021	67.8%
In civilian labor force, female, percent of population age 16 years+, 2017-2021	63.4%
Total accommodation and food services sales, 2017 (\$1,000) (c)	434,804
Total health care and social assistance receipts/revenue, 2017 (\$1,000) (c)	1,387,573
Total transportation and warehousing receipts/revenue, 2017 (\$1,000) (c)	106,108
Total retail sales, 2017 (\$1,000) (c)	2,596,591
Total retail sales per capita, 2017 (c)	\$27,429
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2017-2021	16.9
Income & Poverty	
Median household income (in 2021 dollars), 2017-2021	\$74,253
Per capita income in past 12 months (in 2021 dollars), 2017-2021	\$43,680
Persons in poverty, percent	▲ 10.0%
BUSINESSES	
Businesses	
Total employer establishments, 2021	X
Total employment, 2021	X
Total annual payroll, 2021 (\$1,000)	X
Total employment, percent change, 2020-2021	X
Total nonemployer establishments, 2019	X
All employer firms, Reference year 2017	4,337
Men-owned employer firms, Reference year 2017	2,084
Women-owned employer firms, Reference year 2017	838
Minority-owned employer firms, Reference year 2017	250
Nonminority-owned employer firms, Reference year 2017	3,601
Veteran-owned employer firms, Reference year 2017	135
Nonveteran-owned employer firms, Reference year 2017	3,643
GEOGRAPHY	
Geography	
Population per square mile, 2020	2,949.8
Population per square mile, 2010	2,322.0
Land area in square miles, 2020	33.62
Land area in square miles, 2010	33.01
FIPS Code	4105800

[About datasets used in this table](#)

Value Notes

 Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable.] Click the Quick Info  icon to the left of each row in T/ learn about sampling error.

In Vintage 2022, as a result of the formal request from the state, Connecticut transitioned from eight counties to nine planning regions. For more details, please see the Vintage 2022 release notes available here: [Release Notes](#).

The vintage year (e.g., V2022) refers to the final year of the series (2020 thru 2022). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2017-2021 ACS 5-year estimates to other ACS estimates. For more information, please visit the [2021 5-year ACS Comparison Guidance](#) page.





Fact Notes

- (a)Includes persons reporting only one race
- (c)Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data
- (b)Hispanics may be of any race, so also are included in applicable race categories

Value Flags

- Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest or upper interval of an open ended dist
- FFewer than 25 firms
- DSuppressed to avoid disclosure of confidential information
- NData for this geographic area cannot be displayed because the number of sample cases is too small.
- FNFootnote on this item in place of data
- XNot applicable
- SSuppressed; does not meet publication standards
- NANot available
- ZValue greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

CONNECT WITH US     

Information Quality | Data Linkage Infrastructure | Data Protection and Privacy Policy | Accessibility | FOIA | Inspector General | No FEAR Act | U.S. Department of Commerce | USA.gov

Measuring America's People, Places, and Economy



THE STATE OF PUBLIC WATER IN THE UNITED STATES



Food & Water Watch champions healthy food and clean water for all. We stand up to corporations that put profits before people, and advocate for a democracy that improves people's lives and protects our environment. We envision a healthy future for our families and for generations to come, a world where all people have the wholesome food, clean water and sustainable energy they need to thrive. We believe this will happen when people become involved in making democracy work and when people, not corporations, control the decisions that affect their lives and communities.

Food & Water Watch has state and regional offices across the country to help engage concerned citizens on the issues they care about. For the most up-to-date contact information for our field offices, visit foodandwaterwatch.org.

National Office

1616 P Street, NW
Suite 300
Washington, DC 20036
(202) 683-2500

Oakland, California

1814 Franklin Street
Suite 1100
Oakland, CA 94612
(510) 922-0720

Los Angeles, California

3000 S. Robertson Boulevard
Suite 255
Los Angeles, CA 90034
(323) 843-8450

Florida

1044 NE 15th Avenue
Fort Lauderdale, FL 33304
(954) 372-1881

Colorado

1740 High Street
Denver, CO 80218
(720) 449-7505

Iowa

505 Fifth Avenue
Suite 818
Des Moines, IA 50309
(515) 344-4834

Maine

142 High Street
Suite 501-C
Portland, ME 04101
(207) 619-5845

Maryland

3121 St. Paul Street
Suite 28
Baltimore, MD 21218
(410) 394-7650

Michigan

2727 Second Avenue
Suite 136
Detroit, MI 48201
(313) 486-1356

New Jersey

100 Bayard Street
Suite 202
New Brunswick, NJ 08901
(732) 839-0860

New Mexico

7804 Pan American
East Freeway NE #2
Albuquerque, NM 87109
(505) 633-7366

New York

68 Jay Street
Suite 713
Brooklyn, NY 11201
(718) 943-9085

North Carolina

801 Gilbert Street
Suite 204
Durham, NC 27701
(919) 794-6380

Illinois

670 W Hubbard Street
Suite 300
Chicago, IL 60654
(773) 796-6086

Oregon

917 SW Oak Street
Suite 404
Portland, OR 97205
(971) 266-4528

Pennsylvania

1501 Cherry Street
Second Floor
Philadelphia, PA 19102
(267) 428-1903



THE STATE OF PUBLIC WATER IN THE UNITED STATES

TABLE OF CONTENTS

Executive Summary	2
Key Findings	2
Background: The Progressive Era’s Turn to Public Ownership of Water Systems . . .	3
The State of the Industry Today	4
Trends	5
Accountable Service	6
Affordable Service	6
<i>Water Charges of the 500 Largest Water Systems</i>	7
Equitable Service	7
Environmentally Responsible Service	8
<i>Watershed Protection</i>	8
<i>Water Conservation</i>	9
<i>Local Planning and Smart Growth</i>	9
Effective Service	10
Ways Forward	11
Appendix A: Rate Survey State Details	12
Appendix B: Rate Survey Methodology	14
Endnotes	15

Executive Summary

Nearly nine out of ten people in the United States receive their water service from a publicly owned utility. Although water privatization receives a great deal of attention from policy makers, the dominant trend is in the other direction — toward public ownership.

There are many good reasons for this trend. By owning and operating their water and sewer systems, local governments have control over the decisions that determine the cost and quality of services that are essential for public health and wellbeing as well as economic viability. This control allows governments to direct development, planning and growth and to better protect the environment and sustain their local economies.

Food & Water Watch reviewed eight years of data from the Federal Safe Drinking Water Information System to document the ongoing annual shift toward public ownership.

Food & Water Watch also conducted a comprehensive survey of the water rates of the 500 largest U.S. community water systems and found that large for-profit,

privately owned systems charged 59 percent more than large publicly owned systems. This is the largest water rate survey of its kind in the country.

Key Findings

Public water prevails across the country. The vast majority of people receive tap water from a publicly owned utility.

- Publicly owned utilities served 87 percent of people that have piped water service.
- For-profit water companies own only about 10 percent of water systems, most of which serve small communities.

There is an ongoing nationwide trend toward public ownership of water systems. More and more people each year receive their water service from a public utility.

- From 2007 to 2014, the portion of people with water service from publicly owned systems increased from 83 percent to 87 percent.
- Over that period, the number of private systems dropped 7 percent (a loss of nearly 1,700 privately



owned systems), while the number of people served by privately owned systems fell 18 percent (8 million people).

- At the same time, the number of publicly owned systems remained fairly constant, but these public systems saw their service population grow by 10 percent, adding 24 million people to their networks.
- Public water utilities are taking over and consolidating private systems.

Public service is the most affordable option. A survey of the 500 largest community water systems reveals:

- On average, private for-profit utilities charged households 59 percent more than local governments charged for drinking water service — an extra \$185 a year.
- The average government utility charged \$315.56 for 60,000 gallons a year, while the average for-profit company charged \$500.96 (59 percent more) for the same amount of water.
- In New York and Illinois, private systems charged about twice as much as their public counterparts.
- In Pennsylvania, private systems charged 84 percent more than public systems, adding \$323 onto the typical household’s annual water bill.

- In New Jersey, private systems charged 79 percent more than public systems, adding \$230 onto the typical household’s annual water bill.

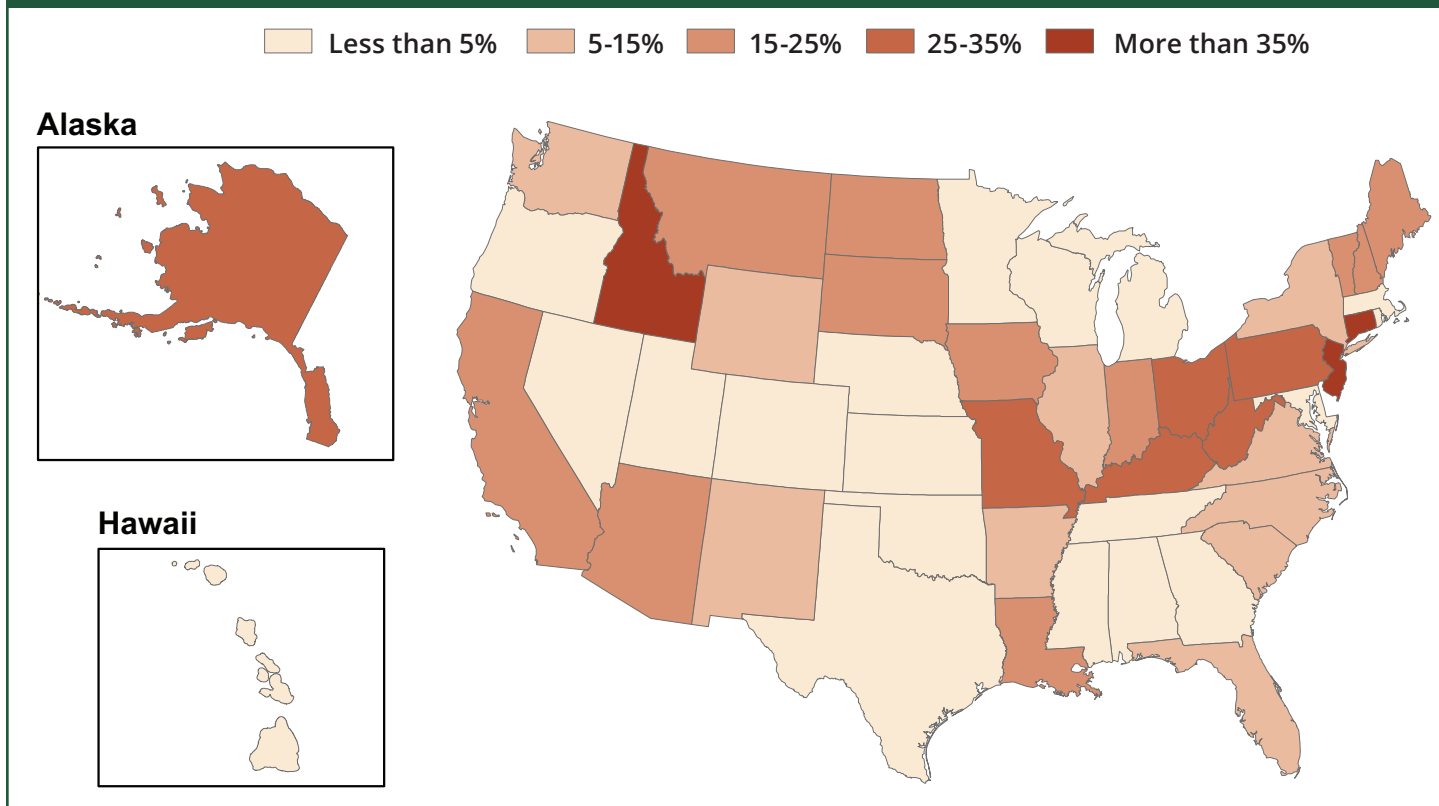
Background: The Progressive Era’s Turn to Public Ownership of Water Systems

Historically, public provision of water services has led to better quality, less-expensive and more-equitable service, and substantial improvements in public health.

Private water companies had served many of the nation’s largest cities until the turn of the twentieth century, when cholera outbreaks and destructive fires inspired a surge of cities to take over water provision for health and public safety reasons. From about 1880 to about 1920, thousands of cities — including Los Angeles and San Francisco — assumed public control of their water systems. This wave drew inspiration from earlier movements toward public water in Boston, New York City, Philadelphia, Baltimore and Chicago.¹

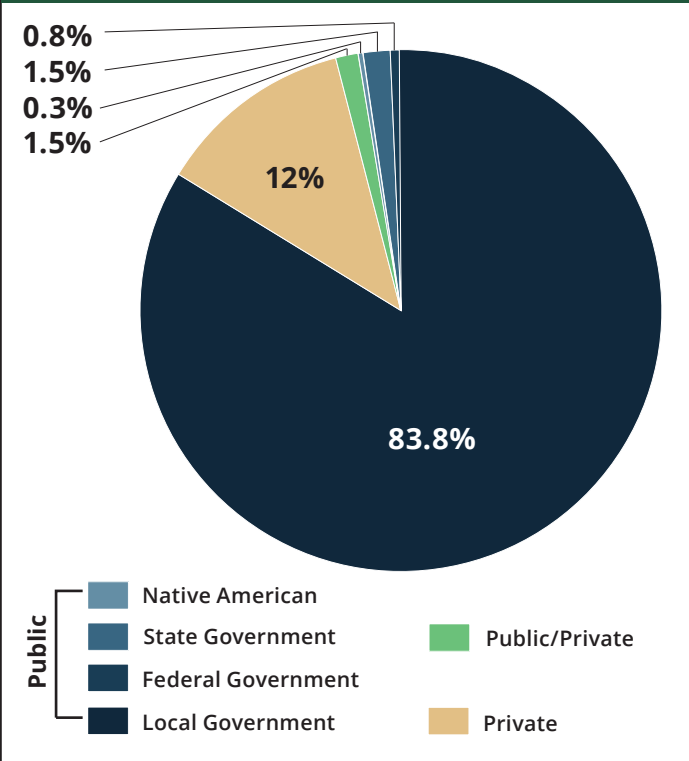
In the 1800s, New York City took over responsibility for providing drinking water services, creating a new system apart from the one privately held by the Manhattan

Figure 1: Private Ownership of Community Water Systems by Service Population (2014)



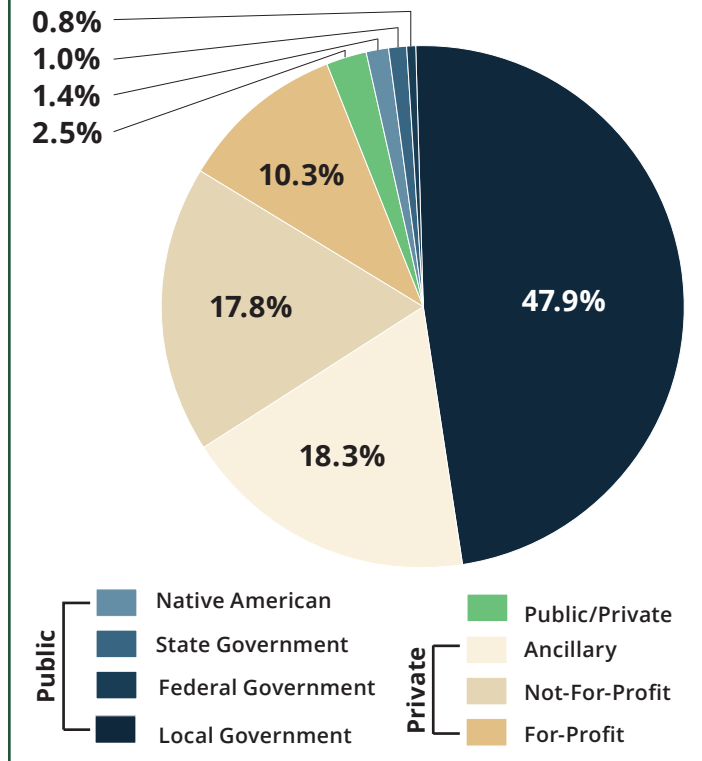
SOURCE: U.S. Environmental Protection Agency. Safe Drinking Water Federal Information System. FY2014 Inventory Data.

Figure 2: Community Water System Ownership By Number of People Served (2014)



SOURCE: U.S. Environmental Protection Agency. Safe Drinking Water Federal Information System. FY2014 Inventory Data. June 30, 2014.

Figure 3: Community Water System Ownership By Number of Systems (2014)



SOURCES: Food & Water Watch calculations based on U.S. Environmental Protection Agency (EPA). Safe Drinking Water Federal Information System. FY2014 Inventory Data; U.S. EPA. "2006 Community Water System Survey: Volume 1." February 2009 at 9.

Company.² The city did this after the Manhattan Company, the predecessor of JPMorgan Chase,³ was blamed for an outbreak of cholera that killed 3,500 people and for inadequate water infrastructure to fight fires.⁴ Similarly, by 1900, concerns about water supply, high prices and poor service had led both Los Angeles and San Francisco to take public control of their water systems from private entities.⁵

For customers, public ownership meant lower water prices. An 1899 federal survey found that public water utilities were charging rates that were 24 percent less than those of private water companies at the time.⁶

Public ownership also significantly expanded access and improved water quality, helping to prevent diseases.⁷ Many cities made large improvements to their water supplies and built new treatment facilities.⁸

For example, after Billings, Mont., bought the Billings Water Company in 1915, the city built a purification plant and extended water lines to serve the whole city.⁹ After New Orleans took over the local private water system in 1908, the city made investments that cut waterborne disease rates dramatically. The private water company that had

served the city distributed unfiltered water from the Mississippi River, which was contaminated by sewage dumped upriver. After residents successfully organized to strip the company of its charter, the city purchased the system and, over the next 15 years, undertook massive improvement projects to expand service and install a filtration system.¹⁰

Public ownership reaped great public health outcomes in large part because it allowed for more-equitable service. Local governments extended water lines to low-income and black communities that had been neglected by private companies.¹¹ One analysis found that public ownership of water systems cut typhoid rates in black populations in the South by as much as 42 percent, yet public ownership had no statistically significant impact on typhoid rates among white populations.¹²

Public ownership remains the most affordable and equitable option today.

The State of the Industry Today

Publicly owned utilities provide most water and sewer services in the United States.¹³ In 2014, public entities served about 87 percent of people with piped water service (see Figure 2).¹⁴ Private water service is concen-

trated in a few states. In 25 states, private water companies serve less than 10 percent of the population, while 4 states have private water companies serving more than 35 percent of their population (see Figure 1).¹⁵

While most people in the United States have public tap water, only about half of U.S. water systems are publicly owned (see Figure 3). The reason is that there are many small private systems serving subdivisions and other small communities, while nearly every large city owns its own water system and serves a much larger population.

According to survey data from the U.S. Environmental Protection Agency (EPA), less than a quarter (22.3 percent) of the privately owned systems are for-profit water businesses.¹⁶ The rest are non-profit entities or ancillary systems, which are systems that are owned by entities whose primary function is not water provision (for example, manufactured home parks).¹⁷

Overall, for-profit water companies own only about 10 percent of U.S. community water systems.¹⁸ The vast majority of the water systems owned by for-profit companies are small, with about 90 percent serving fewer than 3,300 people.¹⁹

Trends

Nationally, there has been an ongoing shift to public ownership of drinking water services. Between 2007 and 2014, the portion of the population with public water increased from 83 percent to 87 percent (see Table 1).

Over this period, the total number of people served by public systems increased by 10 percent, as public systems added 24 million people to their customer base. Meanwhile, the number of people served by privately owned systems fell by 18 percent, as private companies served 8 million fewer people in 2014 than in 2007 (see Table 1).²⁰

One reason for the trend is that the number of private systems decreased 7 percent (see Table 2). There were nearly 1,700 fewer privately owned systems in 2014 than in 2007. The much larger number of public systems remained fairly stable over this period, increasing by just 99 systems.²¹ Migration from rural to urban settings and different rates of population growth also could contribute to this trend.

Reports by the U.S. EPA identified earlier declines in private water systems. One EPA report noted a decrease

Table 1. People Served by Public, Private and Mixed Ownership of Community Water Systems, 2007 and 2014

Ownership Type	People Served (Portion of Total)		Increase or Decrease	% Increase (Decrease)
	2007	2014		
Public	237,634,535 (83.0%)	261,745,966 (87%)	24,111,431	10%
Private	44,459,100 (15.5%)	36,338,067 (12%)	-8,121,033	-18%
Public/Private	4,357,569 (1.5%)	4,511,784 (1%)	154,215	4%
Total	286,451,204	302,595,817	16,144,613	6%

Table 2. Number of Public, Private and Mixed-Ownership Community Water Systems, 2007 and 2014

Ownership Type	Number of Systems (Portion of Total)		Increase or Decrease	% Increase (Decrease)
	2007	2014		
Public	25,671 (49%)	25,770 (51%)	99	0%
Private	25,081 (48%)	23,395 (46%)	-1,686	-7%
Public/Private	1,358 (3%)	1,266 (3%)	-92	-7%
Total	52,110	50,431	-1,679	-3%

in private provision between 2006 and 2008 of about 11 percent.²² Also, the EPA's 2006 Community Water System Survey found a 9 percent decrease in private ownership of water systems from 2000 to 2006, with the biggest drop, percentagewise, coming from larger systems.²³

Municipalization — when local governments buy private systems — is a major reason for the decrease in the number of private systems. Local governments frequently purchase small private systems and combine them with their existing networks.

Accountable Service

Accountability is a major reason why many communities seek public ownership of their water and sewer services. Safe and affordable drinking water and sanitation services are essential, and governments have a basic responsibility to provide these services to protect public health and wellbeing. This entails safeguarding water supplies from pollution and other threats, providing sufficient amounts of safe water and charging water service fees that are affordable.²⁴

When local governments operate water and sewer systems, elected officials make the major policy decisions that determine the cost, availability and quality of these services. They set rates and decide the type and timing of system improvements to address the needs of their constituents.²⁵ If residents object to their service, they can exercise their power at the ballot box by electing officials that are more responsive to their concerns.

Private water companies, in contrast, have no responsibility to promote public health and wellbeing.²⁶ They are accountable first and foremost to their owners and

make their investment decisions based on profitability.²⁷ Because water service is a natural and often legal monopoly,²⁸ if a private water company charges high rates or provides bad service, customers cannot simply switch to another provider. Rather, they are stuck with the company unless they are able to move to another community, which is neither realistic nor desirable for most people.

Affordable Service

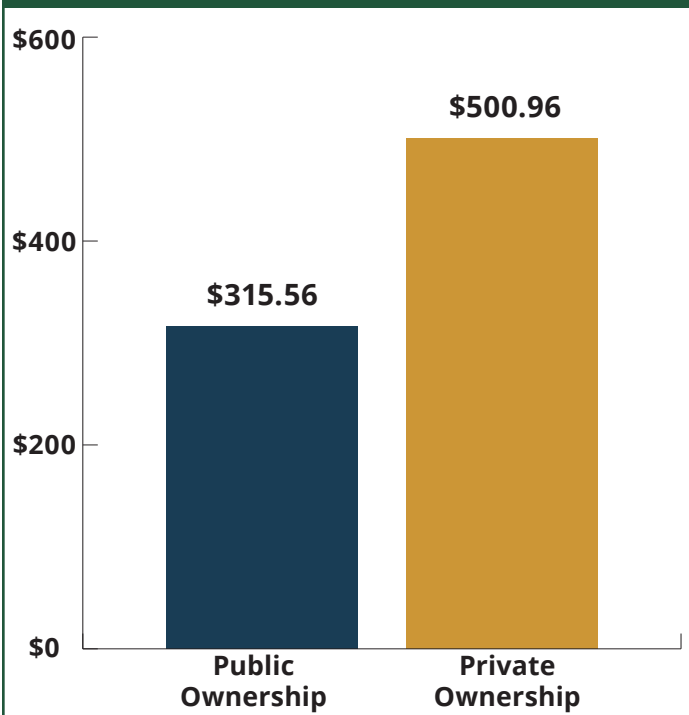
In order to protect public health and wellbeing, local governments must ensure that water service is affordable for every household in a community. With federal support dwindling, water systems aging and the climate changing, achieving universal access to safe water is an increasingly difficult and crucial task for local governments.

Water itself is a priceless common resource, but there is a cost to treating and distributing water to household taps, as well as to collecting and treating the resulting wastewater. With local control over water and wastewater services, a governing body in the local community is able to decide how to allocate the burden of those costs among different users.²⁹ Local governments may subsidize water provision to ensure affordable service for their entire population.³⁰ They could also decide to keep household rates low while charging higher connection fees as a way to promote affordability and discourage sprawling development.³¹

Affordability and accountability go hand in hand. For example, residents can apply political pressure on public officials to keep water rates affordable³² and to implement affordability programs to assist struggling households. With private ownership, residents have little recourse.



Figure 4: Annual Savings With Public Water
Average Annual Water Bills of Households Using
60,000 Gallons a Year From the 500 Largest Water Systems
in the Country, 2015



Water Charges of the 500 Largest Water Systems

An analysis of the 500 largest water systems shows that publicly owned water utilities charge considerably lower rates than their private peers.

Food & Water Watch compiled the rates of the 500 largest community water systems and found that, on average, private, for-profit utilities charged typical households 59 percent more than local governments charged for drinking water service. A typical household, using 60,000 gallons a year, paid \$316 for water service from a local government and \$501 for service from a private company. That is, private ownership corresponds to about \$185 extra each year for the average household (see Figure 4).

Water prices vary across the country, with utilities in the South charging less on average; however, uniformly, private companies had higher prices than government systems (see Figure 5 on page 8). The biggest disparity occurs in the Northeast, where the largest investor-owned utilities are based.

At the state level, the disparities are particularly dramatic in four of the five states with the largest number of private systems (see Figure 6 on page 9).

The survey found that:

- In California, private systems charged 17 percent more than public systems, or an extra \$67 a year.
- In Illinois, private systems charged 95 percent more than public systems, or an extra \$286 a year.
- In New Jersey, private systems charged 79 percent more than public systems, or an extra \$230 a year.
- In New York, private systems charged more than twice as much as public systems, or an extra \$260 a year.
- In Pennsylvania, private systems charged 84 percent more than public systems, or an extra \$323 a year.

Other surveys of water rates and ownership have had similar findings. An analysis of water rates in California cities in 2003 found that private companies charged about 20 percent more on average.³³ A 2010 survey of the largest utilities in the Great Lakes region indicated that private water utilities charged typical households more than twice as much as municipal utilities did.³⁴ A survey of water rates in Delaware and surrounding states showed that, in 2011, investor-owned utilities charged 69 percent more than public utilities.³⁵

U.S. EPA survey data also suggest that privately owned systems charged households higher rates than publicly owned systems, overall and across size categories.³⁶ Indeed, it is widely accepted that private ownership of water systems is associated with higher prices.³⁷

There are a variety of reasons why public water offers customer savings. Most importantly, public entities normally collect only the revenue necessary to improve and run their water systems. Privately owned utilities, however, generate profit by increasing rates. Other factors that make private water more costly for customers include: executive compensation, corporate overhead, subsidies, financing costs, rights of way, and differences in rate-making and financing practices.³⁸

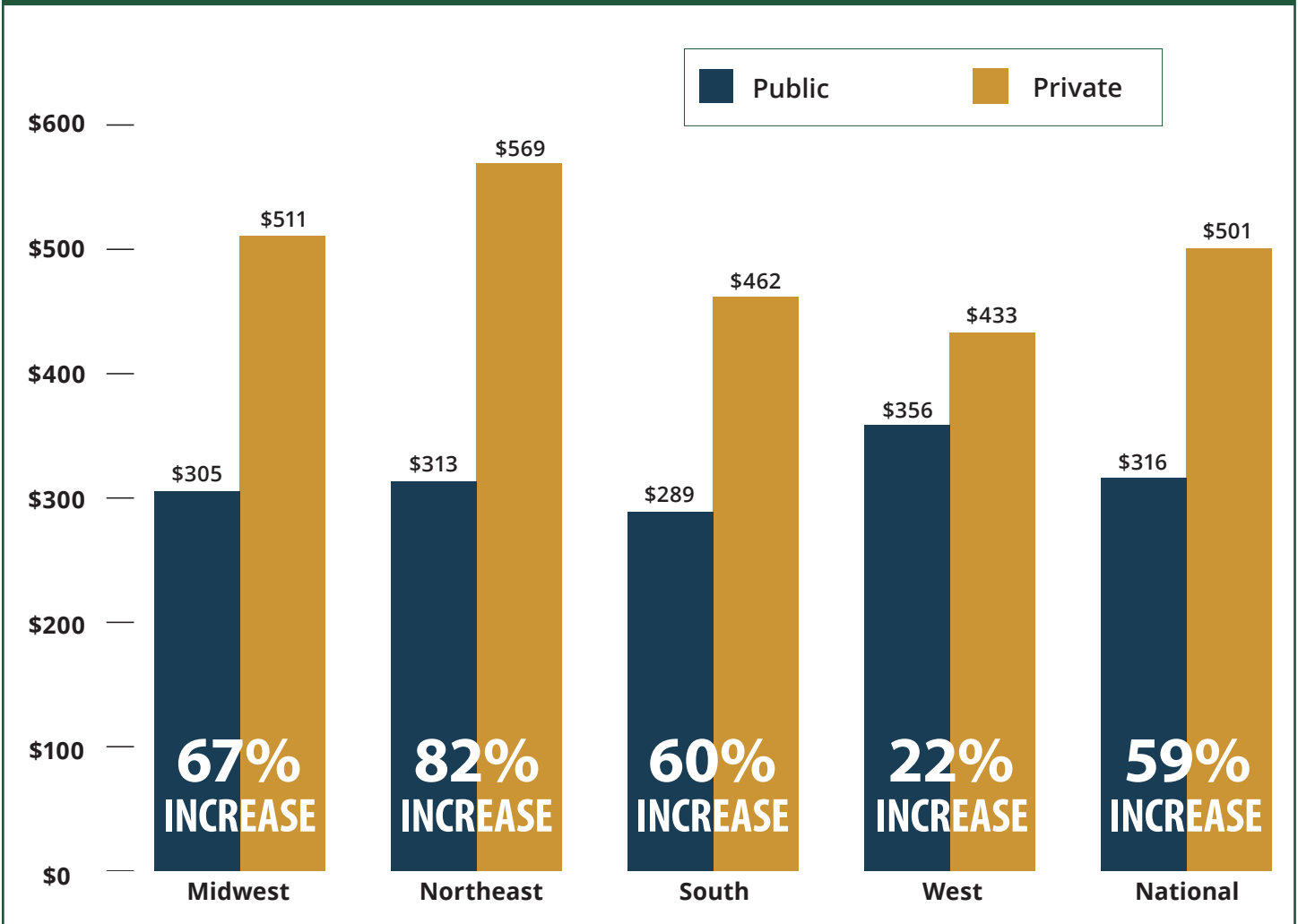
Equitable Service

Because they are directly accountable to their residents, publicly owned utilities generally are more concerned than private entities about issues of social equity.⁴⁰ Public ownership also is more equitable because it provides customers with clearer legal protections from discrimination, given that the Equal Protection Clause applies only to “state action.”⁴¹

Private companies often steer clear of economically depressed and struggling areas that are less profitable. As

Figure 5: Average Annual Water Bill 2015

For Households Using 60,000 Gallons a Year Based on the 500 Largest Community Water Systems



NOTE: See Appendix for methodology and details.

a result, they generally avoid small and rural communities where household income is low or where water quality problems are significant. They typically target a small system only if it is near their existing infrastructure network and they can take advantage of economies of scale.⁴²

Environmentally Responsible Service

A public entity also can be more responsive to its customers — its voters — when it comes to environmental concerns and goals.⁴³

Watershed Protection

Water utilities must work to safeguard their watershed and water supplies from drilling, fracking and coal mining, pipeline spills and oil train accidents, irresponsible logging practices and other disruptive impacts.⁴⁴ Because they are

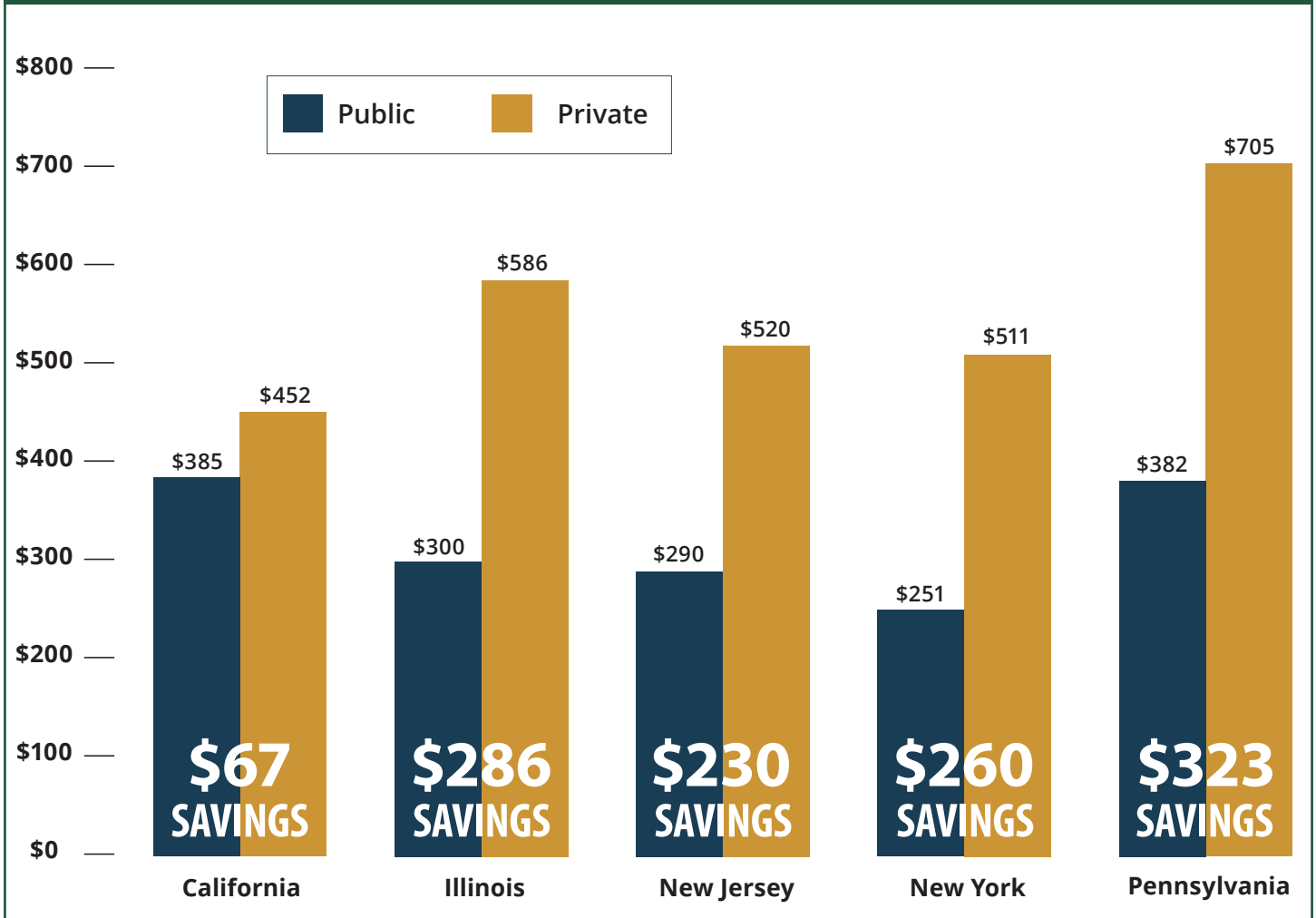
a natural buffer from pollution, forests and open lands protect water supplies, improve water quality and reduce drinking water treatment costs in manifest ways.⁴⁵ Public sector utilities that have strong citizen engagement tend to have stronger watershed protections.⁴⁶

Some private companies have sold land protecting water supplies to developers.⁴⁷ In the 1980s, United Water transferred about 600 acres of land, originally acquired to protect the water supply in Bergen County, New Jersey, to its real estate development subsidiary, which planned to resell the land to developers for substantial profits.⁴⁸

Local governments also have paid the costs of private mismanagement. The city of Willits, California bought its water utility and watershed lands from a private firm in 1984, only to find that the company had failed to make required investments in the water system when it logged the valuable old timber from the land. The city's water

Figure 6: Public Savings Vary by State

Average Annual Water Bills in 2015 for Households Using 60,000 Gallons/Year



system was failing, had many water quality problems and needed a new treatment plant, in large part because of the private company's financial neglect and logging activities.⁴⁹

Water Conservation

Research from California shows that, compared to private water utility companies, publicly owned water utilities more actively encourage and promote water conservation.⁵⁰ Private water systems in California have typically waited for the state to mandate conservation before taking action during droughts.⁵¹

Local Planning and Smart Growth

Public ownership of water and sewer systems allows local governments to direct and plan economic growth and development.⁵² A local governing body decides on capital improvements and extensions to new areas.⁵³ It can coordinate the extension of water and sewer lines to reduce

costs or to serve areas with contaminated private wells or that lack adequate fire service.⁵⁴

Public ownership of water systems is necessary to promote smart growth. Sprawling development can harm the water supply because it changes the natural landscape. When rain hits hard pavement, less of it filters naturally into the ground to recharge the underground aquifers that supply water to wells and often connect to rivers, lakes and streams. Instead, the rainwater can be diverted into storm drains and discharged into surface waters.⁵⁵ Overall, this can strain local drinking water sources that rely on groundwater, and it can lead to sewer overflows when stormwater overwhelms wastewater collection systems.⁵⁶

Private water companies make money on costly sprawling systems, and real estate developers frequently partner with them to serve new satellite developments.⁵⁷ Munic-

ipal systems can also have policies that protect residents from paying to extend service outside the municipal limits to new developments, while private companies often force their customers to subsidize new development.⁵⁸

More broadly, local public control of water utilities is often necessary for successful planning that protects natural resources in that region.⁵⁹ Private ownership of water utilities can complicate and interfere with planning activities. There is no built-in incentive to cooperate with neighboring municipalities and government agencies in protecting water resources, managing watersheds, or working on affordability, equity and sustainability.⁶⁰

Effective Service

Local government water and sewer departments typically work together to reduce costs and share resources. Cities may use wastewater trucks to remove snow or conduct other government tasks, and water department employees may help with emergency preparations for intense storms. Private contractors and utilities, in contrast, have no incentive to share equipment and worker hours.⁶¹

In addition to pooling resources, water and sewer utilities often coordinate with other city departments around transportation projects, urban planning efforts and fire safety, all to more effectively and efficiently protect public

Top Ten Most and Least Expensive Water Systems

Top Ten Most Expensive Water Providers as of January 2015

Rank	Entity	State	Service Population	Ownership	Annual Bill
1	Flint ^a	MI	124,943	Public	\$910.05
2	Padre Dam Municipal Water District	CA	96,589	Public	\$826.94
3	American Water - West	PA	93,368	Private	\$792.84
4	American Water - Pittsburgh	PA	516,411	Private	\$792.84
5	American Water - Lake Scranton	PA	134,570	Private	\$792.84
6	American Water - Norristown	PA	94,724	Private	\$792.84
7	Aqua America - Main	PA	784,939	Private	\$782.38
8	Goleta Water District	CA	87,000	Public	\$736.62
9	American Water - Monterey	CA	94,700	Private	\$716.18
10	American Water - Kanawha Valley	WV	217,959	Private	\$710.63

Top Ten Least Expensive Water Providers as of January 2015

Rank	Entity	State	Service Population	Ownership	Annual Bill
491	Toho Water Authority	FL	110,102	Public	\$123.96
492	Memphis	TN	671,450	Public	\$120.71
493	Medford Water Commission	OR	90,932	Public	\$117.84
494	Hagerstown	MD	88,000	Public	\$116.48
495	Miami-Dade	FL	2,100,000	Public	\$116.46
496	Jefferson Parish - District 1	LA	308,362	Public	\$104.40
497	Jefferson Parish - District 2	LA	209,972	Public	\$104.40
498	Hempstead	NY	110,000	Public	\$101.74
499	Clovis	CA	102,499	Public	\$100.80
500	Phoenix	AZ	1,500,000	Public	\$84.24

a When the survey was conducted in January 2015, Flint, Michigan had the most expensive water service in the country, but during August 2015, a judge ruled that certain rate increases were unlawful and ordered the city to reduce its rates by 35 percent and to end a service fee.³⁹

Note: Annual bills were calculated for households using 60,000 gallons of water a year.

health, safety and welfare.⁶² For example, cities can time water main repairs before road repairs to avoid having to repave roads again after digging up water lines.

In recent years, cities such as Kyle, Texas and Fort Worth, Indiana have sought local public control of water systems to improve water quality and supplies. Expensive, low-quality water and bad service can scare away new businesses and hurt economic development,⁶³ while insufficient water supplies and pressure can put public safety at risk.⁶⁴

Ways Forward

Publicly owned water systems provide the most affordable and equitable service. Government utilities are directly accountable to the people they serve, and they have a fundamental responsibility to promote and protect public health and safety. They are generally more responsive to their community's specific needs and environmental goals, and can best coordinate among different government divisions to achieve gains in public health and welfare.

Public water utilities can further improve their services by:

- Enhancing public input through open and transparent procedures that encourage stakeholder involvement;
- Boosting in-house expertise through targeted hiring, reducing contracting and investing in job training for current staff;

- Implementing water affordability programs that provide credits to low-income households, adjusting their water bills to a level that they can afford to pay;
- Working to ensure source water protection locally and regionally;
- Maximizing services and reducing costs through greater coordination among their departments; and
- Sharing resources and expertise through public-public partnerships with other public sector, labor and non-profit entities.

Our local water systems should not have to go it alone. The federal government has a responsibility to ensure that our local public water and sewer systems receive the support they need. Communities across the country need a dedicated source of federal funding for our water systems to improve water quality, protect the environment, create good jobs and ensure safe, reliable water for generations to come.

With a renewed federal investment in our water resources, robust, responsive and responsible public utilities can best meet the needs of communities and ensure safe and affordable water for all.

Appendix A: Rate Survey State Details

Average Annual Household Water Bills, as of January 2015

Based on the 500 Largest Community Water Systems in the United States and Assuming 60,000 Gallons a Year per Household

Region and State	System Ownership		Increase Under Private	
	Public	Private	Amount	Percent
Midwest	\$305.48	\$511.05	\$205.57	67%
Illinois	\$300.31	\$586.33	\$286.02	95%
Indiana	\$267.04	\$407.67	\$140.63	53%
Iowa	\$270.87	\$468.75	\$197.88	73%
Kansas	\$364.50			
Michigan	\$324.10			
Minnesota	\$236.49			
Missouri	\$357.76	\$422.41	\$64.65	18%
Nebraska	\$224.32			
North Dakota	\$255.00			
Ohio	\$302.81	\$519.52	\$216.71	72%
South Dakota	\$320.34			
Wisconsin	\$246.45			
Northeast	\$313.12	\$569.35	\$256.23	82%
Connecticut	\$343.02	\$459.27	\$116.25	34%
Maine	\$246.12			
Massachusetts	\$297.28			
New Hampshire	\$358.59			
New Jersey	\$290.01	\$519.92	\$229.91	79%
New York	\$251.05	\$510.56	\$259.51	103%
Pennsylvania	\$382.31	\$705.00	\$322.69	84%
Rhode Island	\$371.78			
South	\$288.89	\$461.71	\$172.82	60%
Alabama	\$284.87			
Arkansas	\$265.70			
Delaware	\$375.42	\$542.85	\$167.43	45%
District of Columbia	\$420.12			
Florida	\$292.44			
Georgia	\$306.27			
Kentucky	\$365.06	\$478.71	\$113.65	31%
Louisiana	\$187.39	\$277.85	\$90.45	48%
Maryland	\$228.73			
Mississippi	\$257.47			
North Carolina	\$287.71			

Average Annual Household Water Bills, as of January 2015 *(continued)*

Region and State	System Ownership		Increase Under Private	
	Public	Private	Amount	Percent
South	\$288.89	\$461.71	\$172.82	60%
Oklahoma	\$296.94			
South Carolina	\$203.16			
Tennessee	\$303.65	\$316.57	\$12.92	4%
Texas	\$290.04			
Virginia	\$317.89	\$297.48	-\$20.41	-6%
West Virginia		\$710.63		
West	\$356.25	\$433.06	\$76.81	22%
Alaska	\$606.48			
Arizona	\$247.45	\$285.23	\$37.78	15%
California	\$385.50	\$452.25	\$66.75	17%
Colorado	\$301.41			
Hawaii	\$343.08			
Idaho		\$254.78		
Montana	\$273.26			
Nevada	\$428.22			
New Mexico	\$261.94			
Oregon	\$298.15			
Utah	\$231.50			
Washington	\$380.45			
Grand Total	\$315.56	\$500.96	\$185.40	59%

Note: None of the 500 largest community water systems was located in Vermont or Wyoming.

The survey compared the residential water prices of investor-owned utilities and local government-owned utilities.

Identifying the Largest Systems. Using the U.S. EPA's Safe Drinking Water Federal Information System, frozen in October 2013, the 500 largest community water systems were identified as the systems serving the largest number of people.

Exclusions. Systems were excluded if they were primarily bulk water sellers (systems serving large populations but fewer than 100 customers), if they were Federal or Native American-owned systems and if they were not located in U.S. states and the District of Columbia. Three systems were private, non-profit entities, and, although their rates were collected, they were excluded from the rate analysis.

Data Collection. During January 2015, system water rates were compiled from utility websites and local government ordinances, if available. In three cases, the rates were not found online, and they were found by calling the utility's customer service line. All source documents are on file with Food & Water Watch.

Household Bill Calculations. Annual water bills were calculated assuming that a typical household uses about 60,000 gallons or 80.2083 hundred cubic feet a year of indoor water. For systems with water budgets, all water use was assumed to be indoor usage. Seasonal rates were weighted to arrive at an annual average. Rates were calculated for the main service division or inside jurisdiction. The annual bill includes special water-related fees and surcharges, and public fire protection charges if those fees were charged to all households (excluding private fire service protection lines and hydrants).

Endnotes

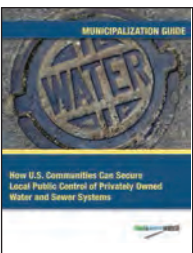
- 1 Spar, Debora and Bebenek Krzysztof. "To the tap: Public versus private water provision at the turn of the twentieth century." *Business History Review*. Vol. 83, Iss. 4. Winter 2009 at 689 to 697; Arnold, Craig Anthony. "Privatization of public water services: The states' role in ensuring public accountability." *Pepperdine Law Review*. Vol. 32, Iss. 3. 2005 at 567 to 569.
- 2 Salzman, James. "Thirst: A Short History of Drinking Water." *Duke Law School Faculty Scholarship Series*. January 2006 at 19 to 20; Spar and Krzysztof, 2009 at 693 to 694.
- 3 JPMorgan Chase & Co. [Brochure]. "The History of JPMorgan Chase & Co." 2008 at 2.
- 4 Salzman, 2006 at 19 to 20.
- 5 Fauconnier, Isabelle. "The privatization of residential water supply and sanitation services: Society equity issues in the California and international contexts." *Berkeley Planning Journal*. Vol. 13. 1999 at 51 to 53; Arnold, 2005 at 568 to 569.
- 6 Troesken, Werner. "Regime change and corruption: A history of public utility regulation." In National Bureau of Economic Research. Glaeser, Edward L. and Claudia Goldin (eds.). (2006). *Corruption and Reform: Lessons from America's Economic History*. University of Chicago Press at 274.
- 7 *Ibid.* at 274.
- 8 Spar and Krzysztof, 2009 at 689.
- 9 Troesken, 2006 at 274.
- 10 *Ibid.* at 274 to 275.
- 11 Troesken, Werner. "Race, disease, and the provision of water in American cities, 1889-1921." *Journal of Economic History*. Vol. 61, No. 3. September 2001 at 773 to 774.
- 12 *Ibid.* at 763.
- 13 U.S. Environmental Protection Agency (EPA). Safe Drinking Water Federal Information System. FY2014 Inventory Data. June 30, 2014; U.S. Government Accountability Office. "Wastewater Infrastructure Financing: Stakeholder Views on a National Infrastructure Bank and Public-Private Partnership." (GAO-10-728). June 2010 at 5; Maxwell, Steve. "The water industry: a closer look at the numbers." *Journal AWWA*. Vol. 103, Iss. 5. May 2011 at 20.
- 14 U.S. EPA, 2014.
- 15 *Ibid.*
- 16 U.S. EPA. "2006 Community Water System Survey: Volume 1." (EPA 815-R-09-001). February 2009 at 8 to 9.
- 17 *Ibid.* at 8 to 9 and 42.
- 18 Food & Water Watch calculations based on U.S. EPA, 2014; U.S. EPA, 2009 at 9.
- 19 U.S. EPA, 2009 at 15.
- 20 Food & Water Watch calculations based on data from U.S. EPA, 2014; U.S. EPA. Safe Drinking Water Information System – Federal Version (SDWIS/FED). Public Water System Inventory data. October 2007.
- 21 Food & Water Watch calculations based on data from U.S. EPA, 2014; U.S. EPA, 2007.
- 22 U.S. EPA, Office of Water. "National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People." (EPA 816-R-10-022). July 2011 at 6 and A-7.
- 23 U.S. EPA, 2009 at 11 to 12.
- 24 Hardberger, Amy. "Whose job is it anyway? Governmental obligations created by the human right to water." *Texas International Law Journal*. Vol. 41. 2006 at 539 to 541; Fauconnier, 1999 at 59 to 60; *Missoula v. Mountain Water Co. and Carlyle Infrastructure Partners*. Cause No. DV-14-352. "Findings of Fact, Conclusions of Law and Preliminary Order of Condemnation." (Mont. Dist. 4, 2015) at 48.
- 25 Urban Futures, Inc. Prepared for the Town of Apple Valley (CA). "Financial Feasibility Analysis for the Acquisition of the Apple Valley Ranchos Water System." February 11, 2014 at 42 to 43.
- 26 Fauconnier, 1999 at 59 to 60; *Missoula v. Mountain Water Co. and Carlyle Infrastructure Partners*, 2015 at 48.
- 27 Smith, Harold. "Overview of Delivery Methods." In Raftelis, George, A. (Ed.). (2005). *Water and Wastewater Finance and Pricing: Third Edition*. Boca Raton, FL: Taylor & Francis at 119; Beecher, Janice A. "Private water and economic regulation in the United States." In Bausch, Andreas and Burkhard Schwenker (Eds.). (2009). *Handbook Utility Management*. Berlin: Springer at 794; Beecher, Janice A. et al. National Regulatory Research Institute. "Regulatory Implications of Water and Wastewater Utility Privatization." (NRRI 95-09). July 1995 at 30; Task Force on Privatization of Washington Suburban Sanitary Commission. "Task Force Final Report and Recommendations." November 1999 at Table 3-7 at 4 to 5 and 3-52; Fauconnier, 1999 at 60; *Missoula v. Mountain Water Co. and Carlyle Infrastructure Partners*, 2015 at 48.
- 28 Arnold, 2005 at 580; Beecher, 2009 at 791 and 798 to 799; Beecher, 1995 at 19 to 20.
- 29 Urban Futures, 2014 at 42 to 43; Beecher, 2009 at 789.
- 30 Fauconnier, 1999 at 59.
- 31 Urban Futures, 2014 at 42 to 43; Beecher, 2009 at 789.
- 32 Arnold, 2005 at 584.
- 33 Houtsma, John. Department of Economics. Mount Allison University. "Water Supply in California: Economies of Scale, Water Charges, Efficiency and Privatization." Presented at 43rd Congress of European Regional Science Association. Jyväskylä, Finland. August 27-30, 2003 at Abstract #379 at 8.
- 34 Beecher, Janice A. and Jason A. Kalmbach. Michigan State University, Institute of Public Utilities. "2010 Great Lakes Water Survey." February 1, 2011 at Exhibit 11 on 14.
- 35 University of Delaware, Water Resources Agency, Institute for Public Administration. "Water Rates in Delaware and Surrounding States." (Draft). September 2014 at 2.
- 36 U.S. EPA, 2009 at 21 to 23.
- 37 Beecher, 2009 at 788 to 799; Shih, Jhih-Shyang et al. "Economies of scale in community water systems." *Journal AWWA*. September 2006 at 107; Beecher, 1995 at 103.
- 38 Beecher and Kalmbach, 2011 at 15 to 16; National Research Council. (2002). *Privatization of Water Services in the United States*. Washington, D.C.: National Academy of Science at 51 to 52; U.S. EPA. "Response to Congress on Privatization of Wastewater Facilities." (EPA 832-R-97-001a). July 1997 at 25; *Missoula v. Mountain Water Co. and Carlyle Infrastructure Partners*, 2015 at 29; Beecher, 1995 at 103; Beecher, Janice A. "What matters to performance? Structural and institutional dimensions of water utility governance." *International Review of Applied Economics*. Vol. 27, Iss. 2. April 2013 at 156.
- 39 Fonger, Ron. "Judge orders Flint to cut water rates 35 percent in sweeping injunction." *Michigan Live*. August 7, 2015.
- 40 Arnold, 2005 at 597.
- 41 *Ibid.* at 599.
- 42 Klappauf, Laurie. "Privatization raises both questions and opportunities." *Water Sense*. Vol. 3, Iss. 3. Summer 1997 at 5 to 6; "Investors own private systems." *Water Sense*. Vol. 3, Iss. 3. Summer 1997 at 12 to 13; U.S. General Accounting Office. "Water infrastructure: Information on financing, capital planning, and privatization." (GAO-02-764). August 2002 at 51 to 52; Beecher, 1995 at 31.
- 43 Arnold, 2005 at 591.
- 44 Herbert, Elizabeth. "Forest management by West Coast water utilities: Protecting the source?" *Journal AWWA*. Vol. 99, Iss. 2.

- February 2007 at 91 to 92; See Food & Water Watch. "The Urgent Case For a Ban on Fracking." February 2015.
- 45 Fischer, Richard A. et al. "Improving Riparian Buffer Strips and Corridors for Water Quality and Wildlife." American Water Resources Association. International Conference on Riparian Ecology and Management in Multi-land Use Watersheds. August 2000 at 2; Wenger, Seth J. and Laurie Fowler. Carl Vinson Institute of Government. The University of Georgia. "Protecting Stream and River Corridors: Creating Effective Local Riparian Buffer Ordinances." Public Policy Research Series. 2000 at 4 and 48 to 49.
- 46 Herbert, 2007 at 104 to 105.
- 47 Spencer, Louisa C. "A vote for legislation to save Bergen County's watershed." *The Record*. April 25, 1991; Arnold, 2005 at 591 to 592.
- 48 Hanley, Robert. "Utility selling watershed area for large profits." *New York Times*. August 5, 1987.
- 49 Herbert, 2007 at 99.
- 50 Kallis, Giorgos et al. "Public versus private: Does it matter for water conservation? Insights from California." *Environmental Management*. Vol. 45. 2010 at 177 to 178.
- 51 *Ibid.* at 178.
- 52 Beecher, 1995 at 31 and 81 to 83; Hardy, Robert B. and John Munderloh. Statewide Water Advisory Group. "Yavapai County Water." June 2, 2006 at 11 and 21.
- 53 Urban Futures, 2014 at 42 to 43.
- 54 Richards, Brannon et al. "Purchase and Acquisition of a Private Utility System." Paper presented at NC AWWA-WEA 90th Annual Conference, Winston-Salem, NC, November 14-17, 2010 at 2, 4, 6 and 8 to 9; *Missoula v. Mountain Water Co. and Carlyle Infrastructure Partners*, 2015 at 52 and 53; Menon, Kumar and Adam O'Connor. "We'll drink to that: Transition to city utilities complete." *Journal-Gazette* (Fort Worth, Indiana). October 12, 2015.
- 55 U.S. EPA, Nonpoint Source Control Branch. "Protecting Water Quality from Urban Runoff." (EPA 841-F-03-003). February 2003.
- 56 Brown, Ann et al. Sierra Club. "Sprawl: The Dark Side of the American Dream." 1998 at 4 to 5.
- 57 For more information, see Food & Water Watch. "Water and sewer privatization contributes to sprawl." January 2010.
- 58 *Missoula v. Mountain Water Co. and Carlyle Infrastructure Partners*, 2015 at 41; Beecher, 2009 at 788.
- 59 Arnold, 2005 at 591 to 593; Boland, John H. "The business of water." *Journal of Water Resources Planning and Management*. Vol. 133, Iss. 3. May/June 2007 at 191; Beecher, 1995 at 30 at 31.
- 60 Arnold, 2005 at 592 to 593; Boland, 2007 at 189 to 191.
- 61 Association of Metropolitan Sewerage Agencies and Association of Metropolitan Water Agencies. "Evaluating Privatization II: An AMSA/AMWA Checklist." 2002 at 23.
- 62 Hoffbuhr, Jack W. "Take your fire chief to lunch." *Journal of the American Water Works Association*, Vol. 95, Iss. 12. December 2003 at 6; Association of Metropolitan Sewerage Agencies and Association of Metropolitan Water Agencies, 2002 at 23; *Missoula v. Mountain Water Co. and Carlyle Infrastructure Partners*, 2015 at 24, 53, 63 to 64.
- 63 Hilsenbeck, Kim. "Kyle offers water option for Monarch customers." *Hays Free Press* (Kyle, Texas). August 1, 2012.
- 64 Menon and O'Connor, 2015.



Borrowing Trouble: Water Privatization Is a False Solution for Municipal Budget Shortfalls

The 2008 global financial crisis left many governments around the world with serious fiscal challenges, and a number of public officials across the globe sought to lease or sell public water and sewer systems to fund ongoing government functions or to pay down liabilities. The government's primary objective in these privatization arrangements is to obtain a sizable upfront payment from the company or consortium that takes over the water or sewer system, often as a desperate response to a fiscal crisis. But this money is not free; rather, it should be thought of as a loan. Residents and local businesses will have to repay it, with interest, through their water bills.



Water Municipalization Guide

Many communities across the country want local public control of their water and sewer services. Municipalization — the purchase of a privately owned system by a local government — is a fairly common occurrence, but for communities unfamiliar with it, the process could appear daunting. This guide provides an overview of the process and a number of logistical considerations involved in government purchases of privately owned water and sewer systems. Although the general procedure is similar, the specifics will vary by situation, partly because every state has its own legal and regulatory framework.



Aqua America: A Corporate Profile

Aqua America focuses on buying water systems and hiking water prices. It typically purchases small water and sewer systems in areas near its existing network. In addition to owning systems, the company operates a handful of local government-owned systems, but it uses those deals as a way to build its reputation and to get a foot in the door on a possible acquisition of the systems. After taking over and building out its systems, the company seeks to increase water rates. The ability to hike consumer bills is the key to its earnings.



American Water: a Corporate Profile

American Water Works Company is the largest publicly traded U.S. water utility company, serving approximately 14 million people in more than 30 states and two Canadian provinces. American Water has come under fire from communities across the country for charging high rates, providing poor service, endangering public safety and lacking public accountability. From Birmingham, Alabama, in the 1950s to Felton, California, in 2008, communities across the country have wrested local control of their water systems from American Water.



National Office

1616 P Street, NW
Suite 300
Washington, DC 20036
(202) 683-2500

foodandwaterwatch.org

Exhibit 21

Page 20 of 20

[Home](#) > [Reports & Testimonies](#) > Private Water Utilities: Actions Needed to Enhance Ownership Data

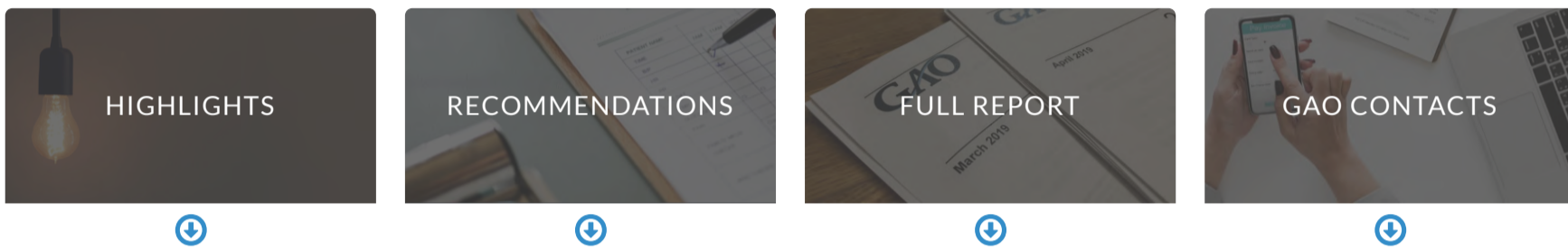
Private Water Utilities: Actions Needed to Enhance Ownership Data

GAO-21-291

Published: Mar 26, 2021. Publicly Released: Apr 26, 2021.



Jump To



Fast Facts

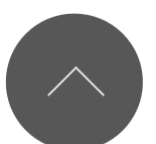
More than 10% of the U.S. population gets drinking water from privately-owned water utilities and most states regulate the rates these utilities can charge. The utilities are owned by for-profit or nonprofit water companies, or other companies as part of another business. Utility ownership is one of many factors that can affect water rates and compliance with water safety standards.

We found that Environmental Protection Agency data on water utility ownership is inaccurate or outdated. Researchers and policymakers can use this data to help ensure drinking water safety and affordability. We [recommended](#) that EPA take steps to improve this data.



Source: wavebreak3/stock.adobe.com. | GAO-21-291

Highlights

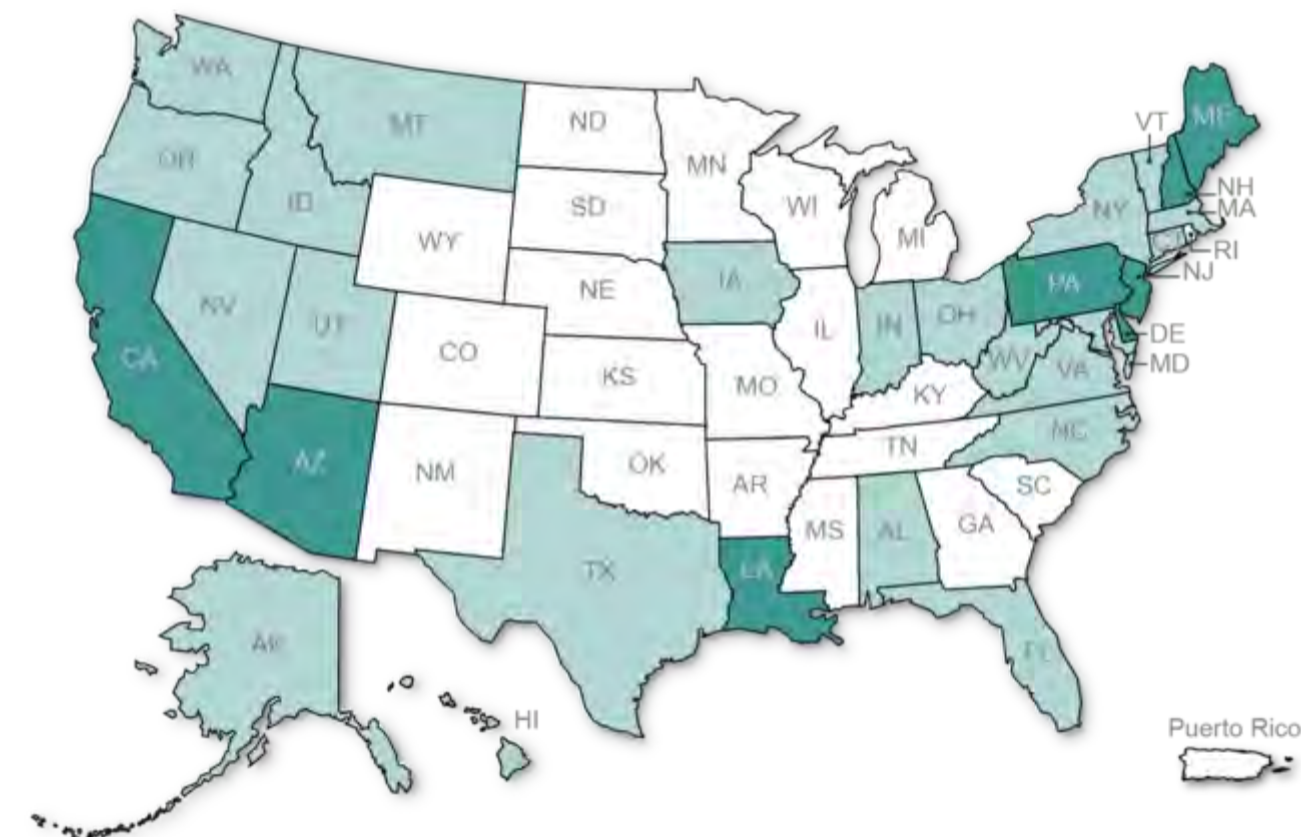


What GAO Found

Available information on private for-profit drinking water utilities shows that 14 publicly traded companies served customers in 33 states in 2019. However, the Environmental Protection Agency's (EPA) primary source of publicly available information on U.S. drinking water utilities—the Safe Drinking Water Information System (SDWIS)—contains ownership information that is limited by inaccuracies. EPA collects information in SDWIS from states but does not include definitions for utility ownership types in its data entry guidance. In addition, EPA takes actions to verify some of the data, but does not verify or correct ownership data. EPA and others use SDWIS for purposes such as analyzing Safe Drinking Water Act violations by type of utility ownership. Such analysis can help EPA and states build utility capacity to provide safe drinking water. By defining ownership types, and verifying and correcting the data in SDWIS, EPA could help ensure the data are accurate and reliable for users of the data and the public.

EPA provided over \$500 million in Drinking Water State Revolving Fund (SRF) assistance to for-profit utilities for 226 projects to help ensure delivery of safe drinking water from January 2010 through June 2020. EPA's Drinking Water SRF program, created under the Safe Drinking Water Act, provides grants to states for low- or no-interest loans or grants to drinking water utilities for infrastructure projects. The amount provided to for-profit water utilities is small, about 2 percent of the \$26.5 billion provided overall from January 2010 through June 2020.

States That Provided Private For-Profit Utilities with Assistance from the Drinking Water State Revolving Fund, since January 2010



Assistance for for-profit projects: \$501 million (Total number of projects: 226)

\$0 assistance to private-for-profit water utilities
 Less than \$10 million
 Greater than \$10 million

Sources: GAO analysis of Environmental Protection Agency data from the Project Benefits Reporting database; Map Resources (map). | GAO-21-291

Why GAO Did This Study

The roughly 50,000 drinking water utilities in the United States face steep costs—more than \$470 billion over the next 20 years, according to EPA estimates—to repair and replace drinking water infrastructure. These costs are passed on to customers through water rates. States regulate the rates charged by privately owned water utilities. EPA has responsibilities to implement programs to further the health protection objectives of the Safe Drinking Water Act.

GAO was asked to review private for-profit drinking water utilities and rates. This report examines, among other things, (1) information available from EPA and other sources about the number and characteristics of private for-profit water utilities in the United States, and (2) Drinking Water SRF assistance provided to private for-profit water utilities. GAO reviewed EPA SDWIS data, Drinking Water SRF data, and Global Water Intelligence data, as well as EPA's and others' documents. GAO also interviewed EPA and water utility stakeholders.

Recommendations

GAO is making two recommendations, including that EPA define all utility ownership types in SDWIS and verify and correct this data as needed. In written comments on the report, EPA generally agreed with both recommendations.

Recommendations for Executive Action

Agency Affected	Recommendation	Status
Office of Water	The Assistant Administrator for EPA's Office of Water should develop definitions for all utility ownership types for regional offices and states to use when entering data on ownership type in EPA's Safe Drinking Water Information System and should verify and correct the data as needed. (Recommendation 1)	<div>● Open ⓘ</div> <p>As of December 2022, EPA officials said they are currently working to modernize SDWIS and plan to incorporate the definitions into the updated version of SDWIS, which is expected to be available to states by late 2024. GAO will review these actions when they are completed.</p>
Office of Water	The Assistant Administrator for EPA's Office of Water should conduct another Community Water System Survey to establish an updated, accurate baseline of drinking water utility information for rulemaking and other purposes. (Recommendation 2)	<div>● Open ⓘ</div> <p>As of February 2023, EPA officials told us that they plan to conduct another Community Water System Survey and expect data collection to begin in 2024. GAO will review appropriate documents and actions when they become available.</p>

Full Report



[Highlights Page \(1 page\)](#)



[Full Report \(76 pages\)](#)



[Accessible PDF \(94 pages\)](#)

GAO Contacts

J. Alfredo Gómez

Director

✉ gomezj@gao.gov

☎ [\(202\) 512-3841](tel:(202)512-3841)

Office of Public Affairs

Chuck Young

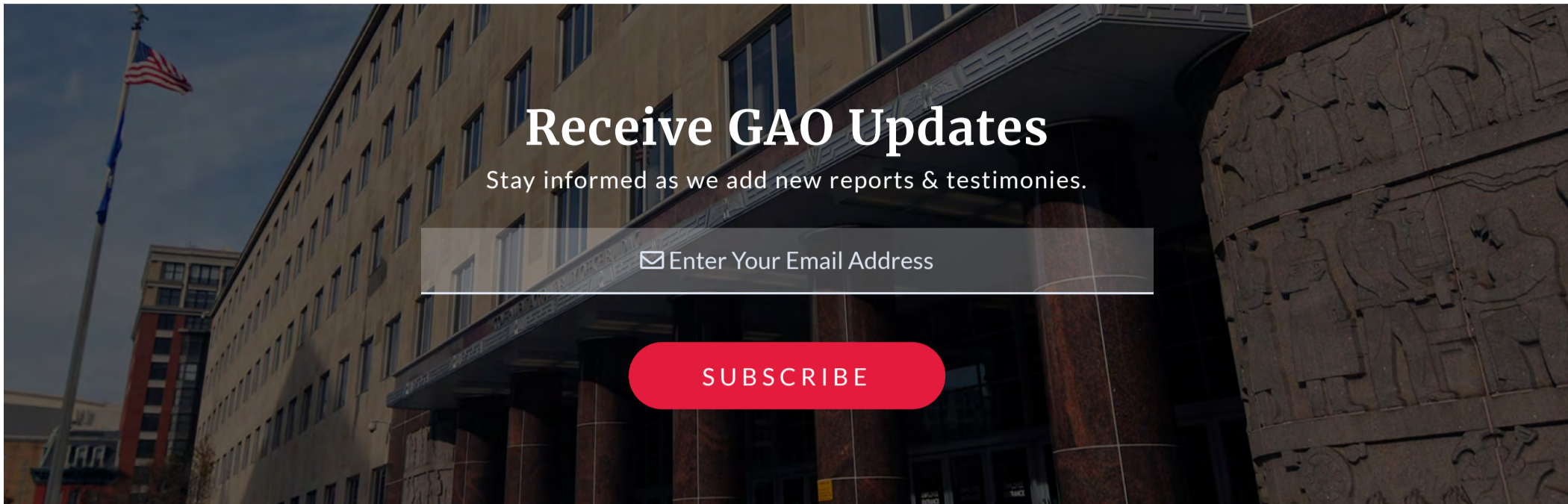
Managing Director

✉ youngc1@gao.gov

☎ [\(202\) 512-4800](tel:(202)512-4800)

Topics

- Natural Resources and Environment
- Communities
- Compliance oversight
- Database management systems
- Environmental protection
- Fair market value
- Grant programs
- Interest rates
- Potable water
- Public and private partnerships
- Public utilities
- Revolving funds
- Safe drinking water
- Utility rates
- Wastewater
- Water infrastructure
- Water quality standards
- Water systems



Receive GAO Updates

Stay informed as we add new reports & testimonies.

SUBSCRIBE



U.S. Government Accountability Office

- f
- 🐦
- in
- 📷
- 📺
- 📺
- 🐾
- 🎤
- 📡
- ✉️

[Press Center](#)

[Contact Us](#)

[Inspector General](#)

[Restricted Reports](#)

[Copyright & Terms of Use](#)

[Privacy Policy](#)

[Accessibility](#)

[Sitemap](#)



[FOIA Requests](#)

[Scam Alerts](#)

[No FEAR Act Data](#)

[Health Care Advisory](#)

[Committees](#)

 An official website of the United States government
[Here's how you know](#) 

[MAIN MENU](#)

Search EPA.gov

Drinking Water Requirements for States and Public Water Systems

[CONTACT US](https://epa.gov/dwreginfo/forms/contact-us-about-drinking-water-requirements-states-and-public-water-systems)

Information about Public Water Systems

Related Information

- [Drinking Water Distribution Systems](https://epa.gov/dwreginfo/drinking-water-distribution-system-tools-and-resources)
- [Public Water System Supervision Program](https://epa.gov/dwreginfo/public-water-system-supervision-pwss-grant-program)
- [Private Drinking Water Wells](https://epa.gov/privatewells)

Providing safe drinking water is a partnership that involves EPA, the states, tribes, water systems, and water system operators. The public drinking water systems regulated by EPA and delegated states and tribes provide drinking water to 90 percent of Americans.

A public water system provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year. A public water system may be publicly or privately owned.

There are over 148,000 public water systems in the United States. EPA classifies these water systems according to the number of people they serve, the source of their water, and whether they serve the same customers year-round or on an occasional basis.

Classifications:

EPA has defined three types of public water systems:

- **Community Water System (CWS):** A public water system that supplies water to the same population year-round.
- **Non-Transient Non-Community Water System (NTNCWS):** A public water system that regularly supplies water to at least 25 of the same people at least six months per year. Some examples are schools, factories, office buildings, and hospitals which have their own water systems.
- **Transient Non-Community Water System (TNCWS):** A public water system that provides water in a place such as a gas station or campground where people do not remain for long periods of time.

[Drinking Water Requirements Home <https://epa.gov/dwreginfo>](https://epa.gov/dwreginfo)

[Drinking Water Rules <https://epa.gov/dwreginfo/drinking-water-regulations>](https://epa.gov/dwreginfo/drinking-water-regulations)

[Water Supply Guidance <https://epa.gov/dwreginfo/public-water-system-supervision-program-water-supply-guidance-manual>](https://epa.gov/dwreginfo/public-water-system-supervision-program-water-supply-guidance-manual)

[Training <https://epa.gov/dwreginfo/drinking-water-training>](https://epa.gov/dwreginfo/drinking-water-training)

Learn about Water Systems

[State Resources <https://epa.gov/dwreginfo/state-resources-implementing-drinking-water-rules>](https://epa.gov/dwreginfo/state-resources-implementing-drinking-water-rules)

[Water System Resources <https://epa.gov/dwreginfo/water-system-implementation-resources>](https://epa.gov/dwreginfo/water-system-implementation-resources)

[Contact Us <https://epa.gov/dwreginfo/forms/contact-us-about-drinking-water-requirements-states-and-public-water-systems>](https://epa.gov/dwreginfo/forms/contact-us-about-drinking-water-requirements-states-and-public-water-systems) to ask a question, provide feedback, or report a problem.

LAST UPDATED ON NOVEMBER 15, 2022



Discover.

Accessibility Statement <<https://epa.gov/accessibility/epa-accessibility-statement>>

Budget & Performance <<https://epa.gov/planandbudget>>

Contracting <<https://epa.gov/contracts>>

EPA www Web Snapshot <<https://epa.gov/utilities/wwwepagov-snapshots>>

Grants <<https://epa.gov/grants>>

No FEAR Act Data <<https://epa.gov/ocr/whistleblower-protections-epa-and-how-they-relate-non-disclosure-agreements-signed-epa>>

Plain Writing <<https://epa.gov/web-policies-and-procedures/plain-writing>>

Privacy <<https://epa.gov/privacy>>

Privacy and Security Notice <<https://epa.gov/privacy/privacy-and-security-notice>>

Connect.

Data.gov [🔗](https://www.data.gov/) <<https://www.data.gov/>>

Inspector General <<https://epa.gov/office-inspector-general/about-epas-office-inspector-general>>

Jobs <<https://epa.gov/careers>>

Newsroom <<https://epa.gov/newsroom>>

Open Government <<https://epa.gov/data>>

Regulations.gov [🔗](https://www.regulations.gov/) <<https://www.regulations.gov/>>

Subscribe <<https://epa.gov/newsroom/email-subscriptions-epa-news-releases>>

USA.gov [🔗](https://www.usa.gov/) <<https://www.usa.gov/>>

White House [🔗](https://www.whitehouse.gov/) <<https://www.whitehouse.gov/>>

Ask.

Contact EPA <<https://epa.gov/home/forms/contact-epa>>

EPA Disclaimers <<https://epa.gov/web-policies-and-procedures/epa-disclaimers>>

Hotlines <<https://epa.gov/aboutepa/epa-hotlines>>

FOIA Requests <<https://epa.gov/foia>>

<https://www.epa.gov/epa>

Frequent Questions <<https://epa.gov/home/frequent-questions-specific-epa-programstopics>>

Follow.





Utility Regulation

(/puc/utilities)

(/puc/)

[Home \(/puc/Pages/default.aspx\)](#) > [Utility Regulation \(/puc/utilities/Pages/default.aspx\)](#)

> [Water - Who We Regulate](#)

Water - Who We Regulate

PUC's Role

The Oregon Public Utility Commission (PUC) regulates a portion of the state's 3,500 water systems. The PUC oversees some investor-owned water utilities, as well as select mobile home parks and associations providing water service. The PUC does not regulate any of the 1,100 municipalities and publicly-owned water systems that serve a majority of Oregonians.

All regulated water utilities must comply with PUC service rules and regulations, such as water quality, pressure, customer service, plant repair, and maintenance. The PUC investigates complaints to ensure customers are receiving safe and adequate water service.

A small number of these regulated water utilities must also comply with PUC rules governing rates to ensure residents are receiving service at just and reasonable rates.

View the PUC's Water Regulation Fact Sheet (</puc/utilities/Documents/Water-Regulation-FactSheet.pdf>) for more details.



More in this section

[Oregon Administrative Rules](#)

 • [Water Utilities \(https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=4050\)](https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=4050)

• [Wastewater Utilities \(https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=4051\)](https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=4051)
(<http://www.oregon.gov>)



(/puc/forms/Pages/default.aspx?wp924=f%3a%7bc%3a48076%2co%3a%7bt%3a1%2cv%3a%22Water%22%7d%7d)Water Reports & Forms
(/puc/forms/Pages/default.aspx?wp6900=se%3a%22water%22)

Regulated Water Companies

- For service only (<https://apps.puc.state.or.us/edockets/utlistNoLayout.asp?Electric=&Gas=&Telephone=&Industry=WTR+&Water=SERVIC&submit2=Submit>)
- For rates and service (<https://apps.puc.state.or.us/edockets/utlistNoLayout.asp?Electric=&Gas=&Telephone=&Industry=WTR+&Water=RR++++&submit2=Submit>)

Contact the PUC's Water Division (</puc/forms/Forms%20and%20Reports/Water-Program-Contacts.pdf>)

Help us improve! Was this page helpful?

Yes

No

Quick Links

[About Us \(/puc/about-us\)](/puc/about-us)

[Utility Regulation \(/puc/utilities\)](/puc/utilities)

[Safety \(/puc/safety\)](/puc/safety)

[Reports & Forms \(/puc/forms/Pages/default.aspx\)](/puc/forms/Pages/default.aspx)

[eDockets \(/puc/edockets\)](/puc/edockets)

[News & Events \(/puc/news-events\)](/puc/news-events)

[Filing Center \(/puc/filing-center\)](/puc/filing-center)

[Oregon Board of Maritime Pilots \(/puc/BMP/Pages/default.aspx\)](/puc/BMP/Pages/default.aspx)

Contact Us

Phone: 503-378-6600

 [An official website of the State of Oregon »](#)

Toll Free: 800-522-2404

(<http://www.oregon.gov>)

Consumer Questions:

puc.consumer@puc.oregon.gov (<mailto:puc.consumer@puc.oregon.gov>)



Public Comments:

puc.publiccomments@puc.oregon.gov (<mailto:puc.publiccomments@puc.oregon.gov>)

Address & Hours

Oregon Public Utility Commission
201 High Street SE, Suite 100
Salem, OR 97301-3398

PO Box 1088
Salem, OR 97308-1088

Hours: Mon-Fri, 8am - 5pm

About Oregon

[Oregon.gov](https://www.oregon.gov) (<https://www.oregon.gov>)

[State Employee Search](https://employeesearch.dasapp.oregon.gov) (<https://employeesearch.dasapp.oregon.gov>)


[Agencies Listing](https://www.oregon.gov/pages/a_to_z_listing.aspx) (https://www.oregon.gov/pages/a_to_z_listing.aspx)

[Accessibility](https://www.oregon.gov/pages/accessibility.aspx) (<https://www.oregon.gov/pages/accessibility.aspx>)

[Privacy Policy](https://www.oregon.gov/pages/terms-and-conditions.aspx) (<https://www.oregon.gov/pages/terms-and-conditions.aspx>)

[Supported Browsers](https://www.oregon.gov/pages/supported-browsers.aspx) (<https://www.oregon.gov/pages/supported-browsers.aspx>)

[↑ Back to Top](#)

Select Language 

Powered by [Google Translate](https://translate.google.com) (<https://translate.google.com>)