



**Durham Irrigation District
Board of Directors
Zoom Guidance for Meeting Attendance**
Remote Meeting via Zoom (see below)

Special Notice: Pursuant to California Governor Gavin Newsom's Executive Order N-29-20 issued on March 17, 2020, relating to the convening of public meetings in response to the COVID-19 pandemic, Durham Irrigation District will be closing the Board of Directors Meetings to members of the public and non-essential District staff.

The public may listen to and/or participate in this meeting via landline or mobile telephone or via computer, with video and audio enabled or audio only. If you wish to comment on an item, but do not wish to participate during the meeting, the public may submit comments prior to the meeting via email to info@didwater.org before 5:00 p.m. on the day of the Board Meeting and they will be read into the record.

ACCESSING THE ONLINE MEETING:

We recommend logging-in **15 minutes early (at 5:15 pm)** to get set up and address any technical issues before the meeting starts. When you access the meeting, **you will be placed into a waiting room and admitted** into the meeting by the meeting hosts. There are four methods for joining the meeting:

1 - From Computer - One Click to Join

<https://us02web.zoom.us/j/495193613?pwd=QTduKzhTc0cxMThrOXFMVWdMYVM2QT09>

2 - From Computer Web Browser

<https://zoom.us/join>

When prompted, use Meeting ID: 495 193 613

Passcode: 646356

3 - From your Mobile Phone: One-Tap Mobile

+16699006833,,495193613#,,,,,0#,,646356#

4 - Dial-in using your Mobile Phone or Landline:

+1 669 900 6833

When prompted, use Meeting ID: 495 193 613

**If you are having any issues connecting to the meeting, please call
Durham Irrigation District at (530) 680-7222 for assistance.**

Please note that when you access the meeting, you will be placed into a waiting room and admitted into the meeting by the meeting host.

- The Board of Directors is committed to making its meetings accessible to all citizens. If you need a special accommodation to participate in the meeting, please contact the District Administrative Office at (530) 343-1594 or info@didwater.org at least 24 hours in advance of the meeting.
- The Board of Directors or its President pursuant to Government Code section 54954.3 reserves the right to impose reasonable rules governing public participation on agenda and non-agenda items, including limiting the total amount of time allocated to public testimony on particular issues and for each individual speaker.



**Durham Irrigation District Board of Directors
Board Meeting
September 21, 2021 - 5:30 PM
AGENDA**

**COPIES OF THIS AGENDA AVAILABLE FROM:
Durham Irrigation District Office or Online at www.didwater.org**

Posted: 5:00PM, Sept. 18, 2021 at 9418-C Midway, Durham, CA 95938 and www.didwater.org

Board of Directors:

Matt Doyle, Chair
Raymond Cooper, Director
Kevin Phillips, Director

District Staff:

Kamie Loeser, General Manager
Jeff Carter, District Counsel
Mike Butler, Water Operator
Mark Adams, District Engineer

AGENDA ITEMS:

1. CALL TO ORDER

- 1.1. Roll Call/Establishment of Quorum
- 1.2. Introduction of Guests

- 2. PUBLIC COMMENT - public members wishing to address the Board on items not listed on the Agenda.**
The Durham Irrigation District Board of Directors may take official action only on items included in the posted agenda for a specific scheduled meeting. Items addressed during the Public Comment section are generally matters not included on the agenda and therefore, the Board will not take action at this scheduled meeting. However, such items may be put on the agenda for a future meeting. The public shall have the opportunity to address items that are on the posted agenda. Speakers shall be limited to three minutes each.

3. PRESENTATIONS *(All Items Informational/Possible Action)*

None.

4. CONSENT AGENDA

All items listed under the Consent Agenda are considered to be routine and will be enacted by one motion unless an item is removed. Resolutions will be read by title only. There will be no separate discussion of these items unless members of the Board, or persons in the audience, request specific items to be removed from the Consent Agenda to the Regular Agenda for separate discussion, prior to the time the Board votes on the motion to adopt the Consent Agenda. If any item(s) are removed from

the Consent Agenda, the item(s) will be considered immediately following action on the Consent Agenda. Action Requested: *that the Board of Directors approve the Consent Agenda.*

- 4.1. Minutes for the Regular Meeting held on August 17, 2021.
- 4.2. Monthly Financial Report for August 2021, including the Balance Sheet, Profit & Loss Statement, and the General Ledger.
- 4.3. Approval of the Warrant Sheet from August 13, 2021 to September 17, 2021 including payments, deposits, and transaction adjustments.

5. REGULAR AGENDA

- 5.1. Items Removed from Consent Agenda

6. CORRESPONDENCE (All Items Informational/Possible Action/Direction)

- 6.1 Informational: Copy of Letter from James McCabe to Vina GSA, September 5, 2021, RE: Tuscan Water District to the Vina GSA Board of Directors.

7. GENERAL BUSINESS

- 7.1 Review and possibly revise District practices pertaining to existing parcels within District boundaries and new service connections, associated connection fee, service lateral construction costs, meter fee, and backflow device installation requirements.

8. WATER OPERATIONS BUSINESS

- 8.1. Ongoing/New Business (All Items Informational/Possible Action/Direction)
 - a. Review of Daily Log for August 2021 (Operator Mike Butler)
 - b. Update: Pressure Tank Replacement Terms & Conditions and Preliminary Cost Estimate.
 - c. Update: Bid Package for the Brown/Faber Alley Main Line Replacement Project.

9. ATTORNEY REPORT

- 8.1 Resolution Ordering Election – Initiative to Roll Back Rates to 2018. On August 20, 2020 the County Clerk Recorder provided the District with the “Certificate to Initiative Petition Signature Verification” for the Proposed Initiative Measure to Repeal the Water Rate Increases Adopted by the Board of Directors on January 1, 2019. Per Election Code 9310 the District must either 1) change said ordinance mentioned in the petition or 2) issue an order of election or call for a special election for the measure to be voted on.

10. MANAGER REPORT *(All Items Informational/Possible Action/Direction)*

- 9.1 Update: Report on the comment deadline and discussion of next steps, including written response to the Butte County LAFCo Request for Comments (June 30, 2021) on the Tuscan Water District Application.
- 9.2 Informational: Draft Electronic Annual Reporting System (EARS) Report. State Water Resources Control Board (State Water Board) Survey to collect necessary data to allow the State Water Board to (1) determine the extent of Residential and Commercial drinking water arrearages and COVID-19 related water system revenue loss and establish eligibility; (2) collect the necessary paperwork to process direct payments to water systems for Residential and Commercial drinking water arrearages and COVID-19 related water system debt.
- 9.3 Informational: DWR An Investigation of GW Quality Impacts from a Catastrophic Wildfire Event in Paradise, CA. June 2021.
- 9.4 Informational: Governor signs Assembly Bill 361 to amend California's Open Meeting Laws to Better Facilitate Virtual Meetings During Declared Emergencies.
- 9.4 Possible Action/Direction: Termination of Contract for General Manager Services as of October 9, 2021 and discussion of replacement therefor.

11. VINA GSA *(All Items Informational/Possible Action/Direction)*

- 10.1 Review Joint Powers Agreement and role and responsibilities of the District as a Member Agency.
- 10.2 Vina GSA Report (Manager Loeser, Director Cooper)
- a. Vina GSA Draft Groundwater Sustainability Plan (GSP) released for public review and comment, September 10 through October 19, 2021.
 - b. Vina GSA GSP Workshop, Monday, October 4, 2021 at 6:00 p.m. at the Chico Masonic Center.
 - c. Vina GSA SHAC Meetings:
 - October 19, 2021 (9:00 a.m.-12:00 p.m.)
 - November 4, 2021 (at 1:30 p.m.)
 - d. Vina GSA Board Meetings:
 - Vina GSA/RCRD GSA Board Meetings:
 - November 15, 2021 (meeting changed from 11/10/21)
 - December 15, 2021 (meeting changed from 12/8/21) to adopt GSP

12. DIRECTORS' COMMENTS: Opportunity for Board comments on items not listed on the Agenda.

13. CLOSED SESSION

Pursuant to Government Code section 54956.9, Conference with Legal Counsel – Anticipated Litigation: One case, the facts and circumstances of which might result in litigation against the District

but which the District believes are not yet known to a potential plaintiff or plaintiffs, which facts and circumstances need not be disclosed.

OPEN SESSION

Report on Closed Session.

14. **ADJOURNMENT** – Adjourn to the next Regular Board Meeting, October 19, 2021.

Durham Irrigation District
Profit & Loss
 January through August 2021

	Jan 21	Feb 21	Mar 21	Apr 21	May 21
Ordinary Income/Expense					
Income					
Water Sales Income					
OPERATING REVENUES					
Meter Sales	0.00	650.00	0.00	0.00	650.00
Water Sales	26,815.51	26,338.38	26,440.17	29,414.76	34,848.05
Total OPERATING REVENUES	26,815.51	26,988.38	26,440.17	29,414.76	35,498.05
Total Water Sales Income	26,815.51	26,988.38	26,440.17	29,414.76	35,498.05
Total Income	26,815.51	26,988.38	26,440.17	29,414.76	35,498.05
Expense					
Contract Services					
Accounting Fees	562.50	356.25	420.30	5,387.75	1,050.50
Engineering Support	0.00	337.50	0.00	0.00	0.00
Legal Fees	922.50	3,217.50	1,192.50	1,282.50	3,105.00
Management & Administration	5,101.25	4,386.25	3,368.75	976.25	1,265.00
Total Contract Services	6,586.25	8,297.50	4,981.55	7,646.50	5,420.50
OPERATING EXPENSES					
Administration					
Board Stipends	500.00	400.00	400.00	400.00	500.00
District Wages, Taxes, Insur.					
Insurance	1,540.48	0.00	0.00	0.00	0.00
Payroll Service Fees	0.00	0.00	160.00	105.02	105.02
Payroll Tax Expense	0.00	145.46	210.17	207.60	178.67
Wages	0.00	1,248.50	1,804.00	1,782.00	1,848.00
Total District Wages, Taxes, Insur.	1,540.48	1,393.96	2,174.17	2,094.62	2,131.69
Fees, Dues, Memberships	3,753.81	0.00	0.00	431.95	-500.00
Office Expense					
Meals	0.00	0.00	0.00	27.92	0.00
Postage	339.68	150.00	450.00	150.00	0.00
Supplies	80.45	142.88	47.76	0.00	32.65
Website Hosting	75.00	75.00	75.00	75.00	75.00
Total Office Expense	495.13	367.88	572.76	252.92	107.65
Rent	450.00	450.00	450.00	450.00	450.00
Software Fees	100.00	100.00	220.00	100.00	100.00
Utilities					
Garbage	108.43	118.06	118.06	118.06	118.06
Gas & Electric	3,787.92	3,442.63	3,436.69	3,781.93	4,115.14
Telephone/Internet	257.03	248.33	257.87	257.87	333.18
Total Utilities	4,153.38	3,809.02	3,812.62	4,157.86	4,566.38
Water System Maint, Repair, Repl					
Regular Operations & Maint					
O & M Supplies	1,668.85	188.81	416.54	410.72	608.82
Water Testing Fees	225.60	76.80	144.00	76.80	0.00
Weed Management	0.00	3,200.00	0.00	800.00	1,900.00
Total Regular Operations & Maint	1,894.45	3,465.61	560.54	1,287.52	2,508.82

Durham Irrigation District
Profit & Loss
January through August 2021

	Jan 21	Feb 21	Mar 21	Apr 21	May 21
Water System Repair & Repl.+					
Repairs	0.00	830.81	985.47	1,355.96	1,346.55
Repair Supplies	0.00	0.00	0.00	1,075.10	0.00
Contractor	7,954.60	3,250.00	2,013.40	1,036.00	0.00
Water Operator	4,062.50	2,500.00	2,500.00	3,468.75	3,140.00
Total Water System Repair & Repl.+	12,017.10	6,580.81	5,498.87	6,935.81	4,486.55
Total Water System Maint,Repair,Repl	13,911.55	10,046.42	6,059.41	8,223.33	6,995.37
Total Administration	24,904.35	16,567.28	13,688.96	16,110.68	14,351.09
Bank Service Charges	211.99	173.29	277.32	213.92	225.49
Total OPERATING EXPENSES	25,116.34	16,740.57	13,966.28	16,324.60	14,576.58
Total Expense	31,702.59	25,038.07	18,947.83	23,971.10	19,997.08
Net Ordinary Income	-4,887.08	1,950.31	7,492.34	5,443.66	15,500.97
Other Income/Expense					
Other Income					
NON-OPERATING REVENUE Other Inc	0.00	0.00	0.00	0.00	0.00
NON-OPERATING REVENUE					
Interest Income	0.12	0.11	0.12	0.12	0.12
Total NON-OPERATING REVENUE	0.12	0.11	0.12	0.12	0.12
Total Other Income	0.12	0.11	0.12	0.12	0.12
Other Expense					
Special District Projects					
Expenses					
Agency Fees	0.00	0.00	0.00	0.00	0.00
Development Project Fees	0.00	0.00	0.00	0.00	0.00
Total Expenses	0.00	0.00	0.00	0.00	0.00
Total Special District Projects	0.00	0.00	0.00	0.00	0.00
Total Other Expense	0.00	0.00	0.00	0.00	0.00
Net Other Income	0.12	0.11	0.12	0.12	0.12
Net Income	-4,886.96	1,950.42	7,492.46	5,443.78	15,501.09

Durham Irrigation District
Profit & Loss
January through August 2021

	Jun 21	Jul 21	Aug 21	TOTAL
Ordinary Income/Expense				
Income				
Water Sales Income				
OPERATING REVENUES				
Meter Sales	650.00	650.00	0.00	2,600.00
Water Sales	33,897.20	41,852.38	41,943.56	261,550.01
Total OPERATING REVENUES	34,547.20	42,502.38	41,943.56	264,150.01
Total Water Sales Income	34,547.20	42,502.38	41,943.56	264,150.01
Total Income	34,547.20	42,502.38	41,943.56	264,150.01
Expense				
Contract Services				
Accounting Fees	831.00	525.00	456.75	9,590.05
Engineering Support	0.00	0.00	3,113.75	3,451.25
Legal Fees	427.50	832.50	1,417.50	12,397.50
Management & Administration	1,375.00	1,333.75	1,168.75	18,975.00
Total Contract Services	2,633.50	2,691.25	6,156.75	44,413.80
OPERATING EXPENSES				
Administration				
Board Stipends	800.00	400.00	400.00	3,800.00
District Wages, Taxes, Insur.				
Insurance	5,516.34	-370.93	0.00	6,685.89
Payroll Service Fees	105.02	162.89	110.38	748.33
Payroll Tax Expense	149.88	82.89	139.69	1,114.36
Wages	1,793.00	2,838.00	1,826.00	13,139.50
Total District Wages, Taxes, Insur.	7,564.24	2,712.85	2,076.07	21,688.08
Fees, Dues, Memberships	0.00	0.00	150.00	3,835.76
Office Expense				
Meals	0.00	0.00	0.00	27.92
Postage	300.00	512.04	135.14	2,036.86
Supplies	192.06	179.88	775.70	1,451.38
Website Hosting	100.00	75.00	75.00	625.00
Total Office Expense	592.06	766.92	985.84	4,141.16
Rent	556.00	450.00	450.00	3,706.00
Software Fees	100.00	100.00	100.00	920.00
Utilities				
Garbage	118.06	118.06	118.06	934.85
Gas & Electric	5,044.64	12,173.28	8,758.35	44,540.58
Telephone/Internet	333.02	220.52	366.15	2,273.97
Total Utilities	5,495.72	12,511.86	9,242.56	47,749.40
Water System Maint,Repair,Repl				
Regular Operations & Maint				
O & M Supplies	4,137.46	1,774.61	2,792.29	11,998.10
Water Testing Fees	153.60	225.60	178.80	1,081.20
Weed Management	0.00	0.00	2,300.00	8,200.00
Total Regular Operations & Maint	4,291.06	2,000.21	5,271.09	21,279.30

Durham Irrigation District
Profit & Loss
January through August 2021

	Jun 21	Jul 21	Aug 21	TOTAL
Water System Repair & Repl.+				
Repairs	2,859.06	-4,484.29	5,293.18	8,186.74
Repair Supplies	0.00	0.00	0.00	1,075.10
Contractor	6,892.04	0.00	0.00	21,146.04
Water Operator	3,410.00	3,140.00	3,140.00	25,361.25
Total Water System Repair & Repl.+	13,161.10	-1,344.29	8,433.18	55,769.13
Total Water System Maint,Repair,Repl	17,452.16	655.92	13,704.27	77,048.43
Total Administration	32,560.18	17,597.55	27,108.74	162,888.83
Bank Service Charges	303.74	250.37	324.18	1,980.30
Total OPERATING EXPENSES	32,863.92	17,847.92	27,432.92	164,869.13
Total Expense	35,497.42	20,539.17	33,589.67	209,282.93
Net Ordinary Income	-950.22	21,963.21	8,353.89	54,867.08
Other Income/Expense				
Other Income				
NON-OPERATING REVENUE Other Inc	0.00	850.00	0.00	850.00
NON-OPERATING REVENUE				
Interest Income	0.12	0.12	0.12	0.95
Total NON-OPERATING REVENUE	0.12	0.12	0.12	0.95
Total Other Income	0.12	850.12	0.12	850.95
Other Expense				
Special District Projects				
Expenses				
Agency Fees	0.00	195.60	0.00	195.60
Development Project Fees	562.50	1,025.00	2,585.00	4,172.50
Total Expenses	562.50	1,220.60	2,585.00	4,368.10
Total Special District Projects	562.50	1,220.60	2,585.00	4,368.10
Total Other Expense	562.50	1,220.60	2,585.00	4,368.10
Net Other Income	-562.38	-370.48	-2,584.88	-3,517.15
Net Income	-1,512.60	21,592.73	5,769.01	51,349.93

Durham Irrigation District
General Ledger
As of August 31, 2021

Date	Num	Name	Memo	Paid Amount	Balance
Current Assets					260,390.69
Cash					219,719.16
08/02/2021		Deposit	Deposit	151.67	219,870.83
08/02/2021		Bank Charge		-314.18	219,556.65
08/03/2021		Deposit	Deposit	415.41	219,972.06
08/03/2021		Deposit	Deposit	53.55	220,025.61
08/04/2021		Deposit	Deposit	601.71	220,627.32
08/05/2021		Deposit	Deposit	7,334.60	227,961.92
08/05/2021		Deposit	Deposit	259.50	228,221.42
08/06/2021		Deposit	Deposit	375.86	228,597.28
08/09/2021		Deposit	Deposit	781.26	229,378.54
08/09/2021		Deposit	Deposit	463.67	229,842.21
08/09/2021		Deposit	Deposit	229.15	230,071.36
08/10/2021		Deposit	Deposit	70.59	230,141.95
08/11/2021		Deposit	Deposit	15,913.58	246,055.53
08/11/2021		Deposit	Deposit	459.41	246,514.94
08/11/2021		Deposit	Deposit	104.59	246,619.53
08/11/2021		Deposit	Deposit	101.00	246,720.53
08/12/2021		Deposit	Deposit	111.01	246,831.54
08/12/2021		Wages		-820.06	246,011.48
08/13/2021		Payroll Taxes		-150.94	245,860.54
08/13/2021		Paychex		-55.19	245,805.35
08/13/2021		Deposit	Deposit	302.84	246,108.19
08/13/2021		Returned Item	returned item	-985.63	245,122.56
08/13/2021		Bank Charge	from returned check	-10.00	245,112.56
08/16/2021		Deposit	Deposit	298.58	245,411.14
08/16/2021		Deposit	Deposit	434.79	245,845.93
08/16/2021		Deposit	Deposit	646.50	246,492.43
08/17/2021	9420	Kevin Phillips	Aug 2021	-100.00	246,392.43
08/17/2021	9446	James M. Doyle	Aug 2021	-100.00	246,292.43
08/17/2021	9447	Raymond Cooper	August 2021	-200.00	246,092.43
08/17/2021	9423	Basic Laboratory	colilert testing	-178.80	245,913.63
08/17/2021	9424	JC Hernandez Mainten...		-2,300.00	243,613.63
08/17/2021	9425	Sierra Water Utility	chlorine, hydrant ma...	-2,792.29	240,821.34
08/17/2021	9426	USA North 811	2021 Membership	-150.00	240,671.34
08/17/2021	9427	Ferguson Waterworks		-254.99	240,416.35
08/17/2021	9428	North State Electric	diagnose and repair ...	-453.90	239,962.45
08/17/2021	9429	Northstar Engineering	Brown-Faber pipelin...	-3,113.75	236,848.70
08/17/2021	9430	Sierra Water Utility	well 5 recorder repla...	-4,584.29	232,264.41
08/17/2021	9431	Camp & McLaughlin	Aug 2021 rent	-450.00	231,814.41
08/17/2021	9432	Comcast		-366.15	231,448.26
08/17/2021	9433	Moore Printing Company		-775.70	230,672.56
08/17/2021	9434	PG & E		-8,758.35	221,914.21
08/17/2021	9435	Recology		-118.06	221,796.15
08/17/2021	9436	Sequoyah		-100.00	221,696.15
08/17/2021	9437	Stratti	Dell computer and s...	-1,350.56	220,345.59
08/17/2021	9438	Streamline		-75.00	220,270.59
08/17/2021	9439	FP Mailing Solutions	postage ink	-135.14	220,135.45
08/17/2021	9440	Carter Law Office		-1,417.50	218,717.95
08/17/2021	9441	Kamela Loeser	mgmt services	-1,168.75	217,549.20
08/17/2021	9442	Sheryl Bosman	bookkeeping	-456.75	217,092.45
08/17/2021	9443	Sierra Water Utility		-3,140.00	213,952.45
08/17/2021	9444	Carter Law Office		-1,935.00	212,017.45
08/17/2021	9445	Northstar Engineering		-650.00	211,367.45
08/17/2021		Deposit	Deposit	985.63	212,353.08
08/17/2021		Deposit	Deposit	706.23	213,059.31
08/18/2021		Deposit	Deposit	7,844.35	220,903.66
08/18/2021		Deposit	Deposit	158.08	221,061.74
08/19/2021		Deposit	Deposit	345.09	221,406.83
08/20/2021		Deposit	Deposit	131.38	221,538.21
08/23/2021		Deposit	Deposit	106.48	221,644.69
08/24/2021		Deposit	Deposit	78.34	221,723.03
08/25/2021		Deposit	Deposit	126.19	221,849.22
08/26/2021		Wages		-839.84	221,009.38
08/27/2021		Paychex		-55.19	220,954.19
08/27/2021		Payroll Taxes		-154.85	220,799.34
08/30/2021		Deposit	Deposit	200.29	220,999.63

Durham Irrigation District
General Ledger
As of August 31, 2021

<u>Date</u>	<u>Num</u>	<u>Name</u>	<u>Memo</u>	<u>Paid Amount</u>	<u>Balance</u>
08/30/2021		Deposit	Deposit	3,030.86	224,030.49
08/31/2021		Deposit	Deposit	107.00	224,137.49
		Total Cash		4,418.33	224,137.49
		Cash on Hand			100.00
		Total Cash on Hand			100.00
		Development Fees			26,193.24
		Total Development Fees			26,193.24
		Savings			14,378.29
08/31/2021		Deposit	Deposit	0.12	14,378.41
		Total Savings		0.12	14,378.41
		Total Current Assets		4,418.45	264,809.14
		CAPITAL ASSETS			548,231.14
		Depreciable Assets			548,231.14
		Equipment			43,002.14
08/17/2021	9437	Stratti	Dell computer and s...	1,350.56	44,352.70
		Total Equipment		1,350.56	44,352.70
		Mains			623,540.00
		Total Mains			623,540.00
		Pumps			172,575.00
		Total Pumps			172,575.00
		Structures			16,084.00
		Total Structures			16,084.00
		Wells			127,486.00
		Total Wells			127,486.00
		Less Accum. Dep'n			-434,456.00
		Total Less Accum. Dep'n			-434,456.00
		Total Depreciable Assets		1,350.56	549,581.70
		Total CAPITAL ASSETS		1,350.56	549,581.70
		Non-Depreciable Assets			20,331.00
		Land			20,331.00
		Total Land			20,331.00
		Total Non-Depreciable Assets			20,331.00
		Uncleared Checks			-100.00
		Total Uncleared Checks			-100.00
		NET POSITION			-566,549.00
		Net Investment in Capital Asset			-566,549.00
		Total Net Investment in Capital Asset			-566,549.00
		Total NET POSITION			-566,549.00
		Unrestricted Net Assets			-216,722.91
		Total Unrestricted Net Assets			-216,722.91
		Water Sales Income			-222,206.45
		OPERATING REVENUES			-222,206.45
		Meter Sales			-2,600.00
		Total Meter Sales			-2,600.00

Durham Irrigation District
General Ledger
As of August 31, 2021

<u>Date</u>	<u>Num</u>	<u>Name</u>	<u>Memo</u>	<u>Paid Amount</u>	<u>Balance</u>
Water Sales					-219,606.45
08/02/2021		Deposit	Deposit	-151.67	-219,758.12
08/03/2021		Deposit	Deposit	-415.41	-220,173.53
08/03/2021		Deposit	Deposit	-53.55	-220,227.08
08/04/2021		Deposit	Deposit	-601.71	-220,828.79
08/05/2021		Deposit	Deposit	-7,334.60	-228,163.39
08/05/2021		Deposit	Deposit	-259.50	-228,422.89
08/06/2021		Deposit	Deposit	-375.86	-228,798.75
08/09/2021		Deposit	Deposit	-781.26	-229,580.01
08/09/2021		Deposit	Deposit	-463.67	-230,043.68
08/09/2021		Deposit	Deposit	-229.15	-230,272.83
08/10/2021		Deposit	Deposit	-70.59	-230,343.42
08/11/2021		Deposit	Deposit	-15,913.58	-246,257.00
08/11/2021		Deposit	Deposit	-459.41	-246,716.41
08/11/2021		Deposit	Deposit	-104.59	-246,821.00
08/11/2021		Deposit	Deposit	-101.00	-246,922.00
08/12/2021		Deposit	Deposit	-111.01	-247,033.01
08/13/2021		Deposit	Deposit	-302.84	-247,335.85
08/13/2021		Returned Item	returned item	985.63	-246,350.22
08/16/2021		Deposit	Deposit	-298.58	-246,648.80
08/16/2021		Deposit	Deposit	-434.79	-247,083.59
08/16/2021		Deposit	Deposit	-646.50	-247,730.09
08/17/2021		Deposit	Deposit	-985.63	-248,715.72
08/17/2021		Deposit	Deposit	-706.23	-249,421.95
08/18/2021		Deposit	Deposit	-7,844.35	-257,266.30
08/18/2021		Deposit	Deposit	-158.08	-257,424.38
08/19/2021		Deposit	Deposit	-345.09	-257,769.47
08/20/2021		Deposit	Deposit	-131.38	-257,900.85
08/23/2021		Deposit	Deposit	-106.48	-258,007.33
08/24/2021		Deposit	Deposit	-78.34	-258,085.67
08/25/2021		Deposit	Deposit	-126.19	-258,211.86
08/30/2021		Deposit	Deposit	-200.29	-258,412.15
08/30/2021		Deposit	Deposit	-3,030.86	-261,443.01
08/31/2021		Deposit	Deposit	-107.00	-261,550.01
Total Water Sales				-41,943.56	-261,550.01
Total OPERATING REVENUES				-41,943.56	-264,150.01
Total Water Sales Income				-41,943.56	-264,150.01
Contract Services					38,257.05
Accounting Fees					9,133.30
08/17/2021	9442	Sheryl Bosman	bookkeeping	456.75	9,590.05
Total Accounting Fees				456.75	9,590.05
Engineering Support					337.50
08/17/2021	9429	Northstar Engineering	meter reading	3,113.75	3,451.25
Total Engineering Support				3,113.75	3,451.25
Legal Fees					10,980.00
08/17/2021	9440	Carter Law Office	legal fees	1,417.50	12,397.50
Total Legal Fees				1,417.50	12,397.50
Management & Administration					17,806.25
08/17/2021	9441	Kamela Loeser	mgmt services	1,168.75	18,975.00
Total Management & Administration				1,168.75	18,975.00
Total Contract Services				6,156.75	44,413.80

Durham Irrigation District
General Ledger
As of August 31, 2021

<u>Date</u>	<u>Num</u>	<u>Name</u>	<u>Memo</u>	<u>Paid Amount</u>	<u>Balance</u>
OPERATING EXPENSES					137,436.21
Administration					135,780.09
Board Stipends					3,400.00
08/17/2021	9420	Kevin Phillips	Aug 2021	100.00	3,500.00
08/17/2021	9446	James M. Doyle	Aug 2021	100.00	3,600.00
08/17/2021	9447	Raymond Cooper	August 2021	200.00	3,800.00
Total Board Stipends				400.00	3,800.00
District Wages, Taxes, Insur.					19,612.01
Insurance					6,685.89
Total Insurance					6,685.89
Payroll Service Fees					637.95
08/13/2021		Paychex		55.19	693.14
08/27/2021		Paychex		55.19	748.33
Total Payroll Service Fees				110.38	748.33
Payroll Tax Expense					974.67
08/12/2021		Wages		-81.94	892.73
08/13/2021		Payroll Taxes		150.94	1,043.67
08/26/2021		Wages		-84.16	959.51
08/27/2021		Payroll Taxes		154.85	1,114.36
Total Payroll Tax Expense				139.69	1,114.36
Wages					11,313.50
08/12/2021		Wages		902.00	12,215.50
08/26/2021		Wages		924.00	13,139.50
Total Wages				1,826.00	13,139.50
Total District Wages, Taxes, Insur.				2,076.07	21,688.08
Fees, Dues, Memberships					3,685.76
08/17/2021	9426	USA North 811	2021 Membership	150.00	3,835.76
Total Fees, Dues, Memberships				150.00	3,835.76
Office Expense					3,155.32
Meals					27.92
Total Meals					27.92
Postage					1,901.72
08/17/2021	9439	FP Mailing Solutions	postage ink	135.14	2,036.86
Total Postage				135.14	2,036.86
Supplies					675.68
08/17/2021	9433	Moore Printing Company		775.70	1,451.38
Total Supplies				775.70	1,451.38
Website Hosting					550.00
08/17/2021	9438	Streamline		75.00	625.00
Total Website Hosting				75.00	625.00
Total Office Expense				985.84	4,141.16
Rent					3,256.00
08/17/2021	9431	Camp & McLaughlin	Aug 2021 rent	450.00	3,706.00
Total Rent				450.00	3,706.00
Software Fees					820.00
08/17/2021	9436	Sequoyah		100.00	920.00
Total Software Fees				100.00	920.00

Durham Irrigation District
General Ledger
As of August 31, 2021

Date	Num	Name	Memo	Paid Amount	Balance
Utilities					38,506.84
Garbage					816.79
08/17/2021	9435	Recology		118.06	934.85
Total Garbage				118.06	934.85
Gas & Electric					35,782.23
08/17/2021	9434	PG & E		8,758.35	44,540.58
Total Gas & Electric				8,758.35	44,540.58
Telephone/Internet					1,907.82
08/17/2021	9432	Comcast		366.15	2,273.97
Total Telephone/Internet				366.15	2,273.97
Total Utilities				9,242.56	47,749.40
Water System Maint,Repair,Repl					63,344.16
Regular Operations & Maint					16,008.21
O & M Supplies					9,205.81
08/17/2021	9425	Sierra Water Utility	chlorine	2,792.29	11,998.10
Total O & M Supplies				2,792.29	11,998.10
Water Testing Fees					902.40
08/17/2021	9423	Basic Laboratory	colilert testing	178.80	1,081.20
Total Water Testing Fees				178.80	1,081.20
Weed Management					5,900.00
08/17/2021	9424	JC Hernandez Mainten...		2,300.00	8,200.00
Total Weed Management				2,300.00	8,200.00
Total Regular Operations & Maint				5,271.09	21,279.30
Water System Repair & Repl.+					47,335.95
Repairs					2,893.56
08/17/2021	9427	Ferguson Waterworks	5/26/21 Brown St. re...	254.99	3,148.55
08/17/2021	9428	North State Electric	diagnose and repair ...	453.90	3,602.45
08/17/2021	9430	Sierra Water Utility	chlorine	4,584.29	8,186.74
Total Repairs				5,293.18	8,186.74
Repair Supplies					1,075.10
Total Repair Supplies					1,075.10
Contractor					21,146.04
Total Contractor					21,146.04
Water Operator					22,221.25
08/17/2021	9443	Sierra Water Utility	chlorine	3,140.00	25,361.25
Total Water Operator				3,140.00	25,361.25
Total Water System Repair & Repl.+				8,433.18	55,769.13
Total Water System Maint,Repair,Repl				13,704.27	77,048.43
Total Administration				27,108.74	162,888.83
Bank Service Charges					1,656.12
08/02/2021		Bank Charge		314.18	1,970.30
08/13/2021		Bank Charge	from returned check	10.00	1,980.30
Total Bank Service Charges				324.18	1,980.30
Total OPERATING EXPENSES				27,432.92	164,869.13
NON-OPERATING REVENUE					
Other Inc					-850.00
Total NON-OPERATING REVENUE					-850.00

Durham Irrigation District
General Ledger
As of August 31, 2021

<u>Date</u>	<u>Num</u>	<u>Name</u>	<u>Memo</u>	<u>Paid Amount</u>	<u>Balance</u>
NON-OPERATING REVENUE					-0.83
Interest Income					-0.83
08/31/2021		Deposit	Deposit	-0.12	-0.95
Total Interest Income				-0.12	-0.95
Total NON-OPERATING REVENUE				-0.12	-0.95
Special District Projects					1,783.10
Expenses					1,783.10
Agency Fees					195.60
Total Agency Fees					195.60
Development Project Fees					1,587.50
08/17/2021	9444	Carter Law Office	Creekside Estates	900.00	2,487.50
08/17/2021	9444	Carter Law Office	Symmes TMP	1,035.00	3,522.50
08/17/2021	9445	Northstar Engineering	Symmes TPM	220.00	3,742.50
08/17/2021	9445	Northstar Engineering	Creekside Estates	220.00	3,962.50
08/17/2021	9445	Northstar Engineering	Symmes TPM	210.00	4,172.50
Total Development Project Fees				2,585.00	4,172.50
Total Expenses				2,585.00	4,368.10
Total Special District Projects				2,585.00	4,368.10
TOTAL				0.00	0.00

Item 4.3

DURHAM IRRIGATION DISTRICT

Check Issue Date: 9/21/2021

Cash Balance Date
8/31/2021

Check No.	Stmt Date	Invoice Number	Payee	Invoice Amount	Check Amount	Notes	Financial Category	\$	224,137.49
Stipends									
9449	Stipend Form		Kevin Phillips		\$ 100.00	(1) 9/21 BOD		\$	224,037.49
9448	Stipend Form		Matt Doyle		\$ 100.00	(1) 9/21 BOD		\$	223,937.49
9450	Stipend Form		Raymond Cooper		\$ 300.00	(1) 9/21 BOD; (2) 9/8 Vina GSA - a; (3) 9/8 Vina GSA - b		\$	223,637.49
					Subtotal Stipend	\$500.00		Subtotal Balance	\$ 223,637.49
Regular Water System Maintenance and Operations									
9451	8/24/2021	2108362	Basic Laboratory		\$ 286.00	Colilert testing		\$	223,351.49
					Subtotal Water Operations	\$286.00		Subtotal Balance	\$ 223,351.49
Water System Emergency Repair/Replacement									
9452	9/1/2021	1656913	Ferguson Waterworks	\$299.50	\$ 389.86	fastener and coupler		\$	222,961.63
	9/3/2021	1657706	Ferguson Waterworks	\$90.36		valves		\$	222,961.63
					Subtotal Water System Repair	\$389.86		Subtotal Balance	\$ 222,961.63

DURHAM IRRIGATION DISTRICT

Check No.	Stmt Date	Invoice Number	Payee	Invoice Amount	Check Amount	Notes	Financial Category
Utility & Supplies							
--	8/13/2021	-	AT&T		\$ -	NOTE: ATT Account closed 6/15/2021; refund due.	\$ 222,961.63
9453	9/1/2021	-	Camp & McLaughlin		\$ 450.00	September rent	\$ 222,511.63
--	9/10/2021	-	Comcast		\$ -	Telephone and internet - pd with Comcast gift card	\$ 222,511.63
9454	8/30/2021	-	PG&E	\$ 34.81	\$ 2,793.49	9418 Midway #C (Office)(0596196710-5)	\$ 219,718.14
	8/27/2021	-	PG&E	\$ 1,508.23		Durham Dayton Rd 20'W (5773099695-6)	\$ 219,718.14
	8/27/2021	-	PG&E	\$ 1,250.45		Holland Ave E/S & 500S Serviss(6812590736-7)	\$ 219,718.14
	8/29/2021	-	PG&E	\$ -		Holland Ave S 300' (7938916943-8)	\$ 219,718.14
	8/30/2021	-	PG&E	\$ -		9389 Goodspeed St (9856464053-5)	\$ 219,718.14
9455	8/25/2021	-	Recology		\$ 118.06	garbage service (Well 5)	\$ 219,600.08
9456	8/31/2021	-	Sequoyah Software		\$ 100.00	billing software	\$ 219,500.08
9452	9/1/2021	460814F9-0010	Streamline		\$ 75.00	website host	\$ 219,425.08
online debit	8/30/2021	-	FP Mailing Solutions		\$ 150.00	postage (online download)	\$ 219,275.08
Subtotal Utility					\$3,686.55		Subtotal Balance \$ 219,275.08

Check No.	Stmt Date	Invoice Number	Payee	Invoice Amount	Check Amount	Notes	Financial Category
District Administration, Operations & Management							
Payroll & Insurance							
online debit	8/27/2021	-	Withholdings - Trizzino		\$ 154.85		\$ 219,120.23
online debit	9/10/2021	-	Withholdings - Trizzino		\$ 154.85		\$ 218,965.38
online debit	8/27/2021	-	Employee - Trizzino		\$ 839.84	Administrative Support	\$ 218,125.54
online debit	9/10/2021	-	Employee - Trizzino		\$ 839.84	Administrative Support	\$ 217,285.70
Contractors							
9458	9/15/2021	28803	Carter Law Office		\$ 3,487.50	District Legal Services	\$ 213,798.20
9459	9/1/2021	-	Kamie Loeser		\$ 2,007.50	Management Services	\$ 211,790.70
9460	9/1/2021	7787	Sheryl Bosman		\$ 393.75	Bookkeeping Services	\$ 211,396.95
Water Operations							
9461	9/1/2021	3822	Sierra Water Utility		\$ 3,140.00	Water Operations Services	\$ 207,863.20
Subtotal Admin. Ops. & Mgmt.					\$11,018.13		Subtotal Balance \$ 208,256.95

DURHAM IRRIGATION DISTRICT

Check No.	Stmt Date	Invoice Number	Payee	Invoice Amount	Check Amount	Notes	Financial Category
Agency Fees, Association Dues & Reimbursables							
Fees & Dues							
online debit	8/27/2021		PayChex Fee	\$ 55.19		Payroll Processing Fee	\$ 207,808.01
online debit	9/10/2021		PayChex Fee	\$ 55.19		Payroll Processing Fee	\$ 207,752.82
online debit	9/2/2021		PaySafe/Paystation Fee	\$ 276.15		Online Payment Processing Fee - ("Mtot")	\$ 207,476.67
9462	8/27/2021	VinaGSA-2102	Vina GSA Account	\$ 2,500.00		Pmt 1/2; 209220000/473012	\$ 204,976.67
Reimbursable Payments							
9463	9/1/2021	-	Jeannie Trizzino	\$ 219.03		ParcelQuest access; office supplies	\$ 204,757.64
Subtotal Fees & Reimbursables				\$3,105.56		Subtotal Balance	\$ 205,151.39
Other Expenses							
				NONE			\$ 205,151.39
Other Expenses				\$0.00		Subtotal Balance	\$ 205,151.39

DURHAM IRRIGATION DISTRICT

Check No.	Stmt Date	Invoice Number	Payee	Invoice Amount	Check Amount	Notes	Financial Category
Development Projects							
		Contractor				Project	
		NONE			\$ -		\$ 205,151.39
Subtotal Development Projects					\$0.00		Subtotal Balance \$ 205,151.39
SUBTOTAL PAYMENTS					\$18,986.10		
							Subtotal Remaining Balance \$ 205,151.39
							Check Refund/Cancelled Register Total
							TOTAL REMAINING BALANCE \$ 205,151.39

Petty Cash

8/27/2021	Comcast Gift Card	\$ 300.00	9/21/21 - used to pay Comcast bill - \$178.03
	Cash on Hand	\$ 100.00	
	Balance Remaining On Hand	\$ 400.00	

Check / Payment Refund / Cancel or Void Check Register

Date	CK/Pmt Refund	Status	Paid to	Check Amount	Notes

Director Signature _____
Date _____

Director Signature _____
Date _____

DURHAM IRRIGATION DISTRICT

Deposit Register

Date	Deposit	Deposit Amount	Other Notes
5-Aug-21	Cash/Check Deposit	\$ 7,334.60	
11-Aug-21	Cash/Check Deposit	\$ 104.59	
11-Aug-21	Cash/Check Deposit	\$ 459.41	
11-Aug-21	Cash/Check Deposit	\$ 15,913.58	
17-Aug-21	Cash/Check Deposit	\$ 985.63	redeposit NSF check Acct 61
18-Aug-21	Cash/Check Deposit	\$ 7,844.35	
30-Aug-21	Cash/Check Deposit	\$ 3,030.86	
8/1-8/31/21	Paystation Payments	\$ 7,076.83	
	Subtotal Water Sales Deposits	\$ 42,749.85	

Water Meter Sales	Location
NONE	-

Other Deposits	Notes	
11-Aug-21	State Compensation Insurance Fund - dividend refund	\$ 101.00
24-Aug-21	EDD Refund through Paychex	\$ 78.34
	Water Meter & Other Deposits	\$ 179.34
	Total Deposits	\$42,929.19

Deposit Register for Development Projects Account

NONE

Total Development Project Deposits \$0.00

Director Signature _____

Date _____

Director Signature _____

Date _____

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Board Date: 8/17/2021

DURHAM IRRIGATION DISTRICT
PO BOX 98
DURHAM, CA 95938

Dear Policyholder:

We are pleased to share with you that our Board of Directors has approved a 10% dividend for your 2020 workers' compensation insurance policy.

As a not-for-profit organization, we exist solely to help our policyholders succeed and our injured workers recover. Since 2012, we've reduced our average charged rate by over 40%—about twice as much as the rest of the industry over that period. At the same time, our operational improvements in areas such as claims and underwriting, along with our solid investment performance, allow us to return money to you in the form of a dividend.

While we cannot guarantee future dividends, we pledge our continued commitment to manage our organization, investments, and insurance business with a focus on providing you as much value as possible now and in the future.

Enclosed, you will find your statement that provides more detailed information about your dividend. On behalf of all of us at State Fund, we thank you for being a policyholder and appreciate the opportunity to continue to serve you in the future.

Sincerely,



Vernon Steiner
President and CEO

Disclaimer: Under California law it is unlawful for an insurer to promise the future payment of dividends under an unexpired workers' compensation insurance policy or to misrepresent the conditions for dividend payment. Dividends are payable only pursuant to conditions determined by the Board of Directors or other governing board of the Company following policy expiration. It is a misdemeanor for any insurer or officer or agent thereof, or any insurance broker or solicitor, to promise the payment of future workers' compensation dividends. Past dividend performance is no guarantee of an insurer's future dividend performance.



CALIFORNIA WORKERS' COMPENSATION INSURANCE
EAP POLICYHOLDER DIVIDEND STATEMENT

DURHAM IRRIGATION DISTRICT
PO BOX 98
DURHAM, CA 95938

Pol Effective Date : 01/01/2020
Policy # : 0437944-20
Brokerage : N/A
Policy Term : 01/01/2020 - 01/01/2021

We recently announced the 2020 Policy Year EAP dividend of 10% that is calculated based upon the Estimated Annual Premium (EAP) for your policy. This dividend reflects the continuing significant progress we're making toward a more efficient and fairly priced State Fund. Our Board of Directors determined that there existed surplus in excess of that required to cover our liabilities, contingencies, and reserves for future operational needs (divisible surplus).

Eligibility for a 2020 Policy Year EAP dividend requires that the policyholder shall meet all of the following criteria:

Have a policy that took effect January 1, 2020 through December 31, 2020	YES
2020 policy has expired	YES
2020 policy was final billed	YES
2020 policy was paid in full	YES
2020 policy was not cancelled for cause	YES

Based on the criteria above, you have met the dividend requirements and are eligible to receive a dividend as calculated below.

2020 POLICYHOLDER DIVIDEND CALCULATION

Estimated Annual Premium *	\$1,010.00
Dividend Percentage	10%
Dividend Amount	\$101.00

*If the coverage duration was written less than 335 days, or cancelled for non-cause prior to the agreed written policy contract term, the estimated annual premium was pro-rated for the amount of time the policy was in effect.

The calculation above is based on the Resolutions Declaring a Dividend as approved by the State Compensation Insurance Fund Board of Directors. This Policyholder Dividend Statement provides you with the data used to compute your dividend.

We appreciate the opportunity to serve your workers' compensation insurance needs.

Sincerely,

State Compensation Insurance Fund



CALIFORNIA WORKERS' COMPENSATION INSURANCE
EAP POLICYHOLDER DIVIDEND STATEMENT

*California Code of Regulations {Title 10 CCR 2503 (b)}

Disclaimer statement: Under California Law it is unlawful for an insurer [us] to promise the future payment of dividends under an unexpired workers' compensation policy or to misrepresent the conditions for dividend payment. Dividends are payable only pursuant to conditions determined by the [our] Board of Directors or other governing board [of the Company] following policy expiration. Forfeiture of a right to, reduction in the amount of, or delay in the payment of a policyholder's dividend due to the policyholder's failure to accept renewal of the policy or subsequent policies issued by the same insurer is illegal and constitutes an unfair practice.

The calculation is based on the Resolutions Declaring a Dividend as approved by the State Compensation Insurance Fund Board of Directors for policies whose term of coverage began during the period of January 1, 2020 to December 31, 2020.

Eligibility for an EAP dividend requires that the 2020 policy has expired, was final billed, was paid in full, and was not cancelled for cause without reinstatement.

Losses, Loss Conversion Factor and Retention were not factors used in the calculation of this dividend; there is a single calculation of this dividend; the dividend calculation shall be performed 18 months from the inception date of the policy; there is no minimum Estimated Annual Premium threshold for dividend eligibility; and no minimum calculated dividend payment.

* Estimated Annual Premium (EAP) is that premium, based upon information supplied by the policyholder or their broker at the time of policy inception, which will be earned during the policy period. No dividend shall be paid on any premium owed or paid as a result of an audit. Surcharges or assessments were not included in the premium for dividend purposes.

For any questions, please call (888) 782-8338.

STATE COMPENSATION INSURANCE FUND TREASURY & INVESTMENTS - BUILDING B

5880 OWENS DRIVE, PLEASANTON, CA 94588

CHECK NUMBER 7150299495

DIVIDEND CHECK

DATE: JULY 26, 2021

PAYEE NAME: DURHAM IRRIGATION DISTRICT

GRP	POLICY NUMBER/YR	EXPIRATION DATE	EST. ANNUAL PREMIUM	DIVIDEND PERCENT	DIVIDEND AMOUNT
	0437944-20	1/ 1/21	1,010.00	10.0%	101.00
DURHAM IRRIGATION DISTR		DISTRICT: NF 0437944-20	CHECK NUMBER: 7150299495 1/ 1/20 TO 1/ 1/21		
TOTAL NUMBER CLAIMS	***NA***	TOTAL INC. LOSSES	***NA***		
TOTAL CLOSED CLAIMS	***NA***	LESS: MAX. LOSS ADJMENT	***NA***		
TOTAL CLOSED COMP.	***NA***	NET DVDN LOSSES	***NA***		
TOTAL CLOSED MEDICAL	***NA***	DIVIDEND LOSS RATIO	***NA***		
TOTAL CLOSED L.EXP	***NA***	DIVIDEND PER CENT	10.0%		
TOTAL OPEN COMP.	***NA***	EARNED PREMIUM	1,010.00		
TOTAL OPEN MEDICAL	***NA***	DIVIDEND AMOUNT	101.00		
TOTAL LOSSES	***NA***	PREVIOUSLY PAID	***NA***		
LOSS RATIO	***NA***	CURRENT PAYMENT	101.00		

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STATE COMPENSATION INSURANCE FUND

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POLICY NUMBER 0437944-20 NF DATE JULY 26, 2021

90-4150
1222

\$*****101.00**

PAY ***ONE HUNDRED ONE DOLLARS 00/100***

VOID AFTER 365 DAYS

TO THE
ORDER
OF

DURHAM IRRIGATION DISTRICT
PO BOX 98
DURHAM, CA 95938



Item 6.1

James F. McCabe
APN 040-590-004
Durham CA 95938
September 5, 2021

By email to: Evan Tuchinsky, Chair evantuchinsky@outlook.com

Also submitted through [Contact Us - Vina Groundwater Sustainability Agency \(vinagsa.org\)](http://Contact Us - Vina Groundwater Sustainability Agency (vinagsa.org))

Vina Groundwater Sustainability Agency
c/o Butte County Water and Resource Conservation Department
308 Nelson Ave.
Oroville CA 95965

Re: Preparation of comment letter on LAFCo File No. 21-06; Tuscan Water District

Dear Board Members:

I understand that Butte LAFCo has requested comment from the Vina Groundwater Sustainability Agency (Vina GSA) on an application submitted to LAFCo to form a new California Water District, the Tuscan Water District, under Division 13 of the California Water Code (Cal. Water Code §§ 34000-38501). I am an owner of the parcel shown in the address block above, which is within the proposed territory of the Tuscan Water District and is within the Vina subbasin. I believe that the Tuscan application does not adequately demonstrate that the obvious alternatives to forming a new landowner-voter governmental agency are inadequate to achieve Butte County's groundwater sustainability objectives, and that the application is in other respects deficient, making it impossible for interested stakeholders to determine what they are being asked to consider. Tuscan is a "pig in a poke."¹ The Vina GSA should not decide on whether to buy the Tuscan pig before getting to see it.

I also believe that the formation of the Tuscan Water District would (a) inject a constitutionally infirm agency into Butte County's efforts to achieve groundwater sustainability in a prompt manner and (b) distort the consideration of stakeholder interests required in implementing the groundwater sustainability plan.

¹ A pig in a poke is a thing that is bought without first being inspected, and thus of unknown authenticity or quality. The idiom is attested in 1555:

I wyll neuer bye the pyg in the poke
Thers many a foule pyg in a [fair] cloke

A "poke" is a bag, so the image is of a concealed item being sold.
https://en.wikipedia.org/wiki/Pig_in_a_poke (citations omitted)

As I read the vague and incomplete Tuscan Water District formation application, its current stated purpose is to implement projects and management actions (“PMAs”) identified in the Vina Groundwater Sustainability Agency’s (“Vina GSA”) anticipated Ground Water Sustainability Plan (“GSP”).

The need for a new agency is completely unclear. As I understand it, Tuscan supporters have urged the Vina GSA to conclude that the Vina subbasin overdraft is in the range of 1,100 to 2,500 acre-feet per year. The draft GSP already identifies a host of conservation projects which, in combination, could easily meet an overdraft of that magnitude. No new government agency is required to carry out the conservation PMAs.

The fact that Tuscan proponents are pressing forward suggests that they actually believe the overdraft to be larger, and that modest projects will be inadequate to achieve groundwater sustainability without undesirable usage management. Tuscan seemingly hopes to execute on larger scale, more expensive strategies that would likely require the acquisition of surface water.

The formation of a landowner-voter district specifically to execute selected GSP strategies (a) would violate the Equal Protection Clause of the Fourteenth Amendment of the United States Constitution, (b) thwart the purpose and spirit of the Sustainable Groundwater Management Act (SGMA), and (c) potentially delay Butte County’s achievement of groundwater sustainability and/or expose the County to liability for involving an illegal and unrepresentative entity in the collection of assessments to fund Tuscan’s preferred projects.

For these reasons, and as more fully explained below, I urge the Vina GSA to either (a) recommend that LAFCo deny the Tuscan Water District application, or (b) advise LAFCo that on the current record, the Vina GSA neither supports nor opposes formation of the district.

1. The Tuscan Water District Application Omits Information Required To Be Disclosed, Such That The Application Has Not Fairly Been Considered By All Affected Stakeholders.

As a threshold matter, even after nearly a year and a half of trying, the Tuscan proponents have not managed to file an application that includes all of the information required by LAFCo, or sufficient information for a reviewer to conclude that the proposed district is the most appropriate vehicle through which Vina GSA PMAs should be executed. The Vina GSA should not support the formation of a new district on a deficient and uninformative application, particularly in the absence of consideration by the Board of Supervisors of other structures in which decision-making authority would not be concentrated in the hands of a very few people. (see 2 below).

Butte LAFCo has adopted forms that district proponents are required to complete. The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (Cal. Gov’t Code §§ 56000 et seq.), which governs LAFCo proceedings, provides that the Commission may adopt forms to be used for submittals (Cal Gov’t Code § 56300(e)) and provides that “[e]ach application shall be in

the form as the commission may prescribe.” (Cal. Gov’t Code § 56652(e).) Butte LAFCo has adopted an Application for District Formation. The Tuscan proponents first submitted in June an “Annexation Application,” which is inappropriate for district *formation*.² That application was the only application available on the Butte LAFCo website through early September. Butte LAFCo gave notice of the application to a number of local agencies on June 30, attaching an application. It is unclear from the published notice *which* application was circulated for comment, as only the cover page of the notice has been made publicly available by LAFCo. The Tuscan proponents apparently later filed an application for district formation. That application appeared without fanfare on the Butte LAFCo website after a County resident pointed out to the LAFCo Executive Officer that the published *annexation* application was the wrong form; the original annexation application disappeared from the website when the *formation* application was posted. The district formation application bears the same signature dates as the annexation application, which raises a question as to whether the district formation application was back-dated without disclosure, and was actually first submitted to LAFCo after notice was given to affected agencies.

The Tuscan proponents’ annexation application, which was likely the application provided to the Vina GSA and other affected local agencies for comment,³ failed to include a great deal of information required by LAFCo to be submitted on a district formation application. A comparison of the submitted form (Annexation) and the LAFCo-required form (Formation) shows that the information required to be submitted in 76 formation application elements was completely or largely missing on 36 of them. In other words, the application that was available to the public for nearly three months, and that may have been provided to all affected local agencies for comment, had a defect rate of 47%.

Page	Section	Number of Defects	Number of Items	Percent Defective
2	Checklist	3	9	33%
3-5	Signature Page	1	5	20%
6	Standard Application Form	1	4	25%
7-11	District Formation Supplement	28	46	61%
12	LAFCO Form L-1	2	11	18%
13	LAFCO Form L-2	1	1	100%
	TOTAL	36	76	47%

² The form submitted by proponents can be identified by a scanned footer that appears above the footer appended by proponents:

• Butte Local Agency Formation Commission • Annexation Application • Revised April 19, 2011 • Page 3 •

³ The agenda packet for the August 4, 2021 meeting of the Butte County Water Commission included the annexation application as the application on which comment was requested.

The specific defects are:

Section	Defect List
Checklist (pg 2)	<ul style="list-style-type: none"> • Checklist Item 1, wrong application form • Checklist Item 4, missing two (2) copies of Plan for Services • Checklist Item 9, missing LAFCO Exhibit 8, Plan for Services
Signature Page (pg3-5)	<ul style="list-style-type: none"> • Disclosure Requirements, missing date
Standard Application Form (pg6)	<ul style="list-style-type: none"> • Item 2 – Change of Organization, missing request for Sphere of Influence Amendment, as Petitioners indicated proposal “is not” consistent with SOI on Form L-1.
District Formation Supplement (pg 7-11)	<ul style="list-style-type: none"> • Section A – Justification, missing A1, A2, A3, A4, A5, A6, A7 • Section B – Boundaries, missing B1, B2, B3, B4 • Section C – Plan for Services, missing C1, C2, C3, C4, C5, C6 • Section D – Land Use, missing D1, D5 • Section E – Significant Issues, missing E1 • Section F – Intergovernmental Coordination, missing F3, F4 • Section G – Environmental Determination, did not explain answer to F2 • Section H – Support or Protest, missing H1, H2, H3, incomplete data for H4 • Section I – Public Notice Requirements, missing I1 • Required Exhibits – LAFCO Exhibit 8: Plan for Services – Feasibility Study
Form L-1 (pg 12)	<ul style="list-style-type: none"> • Item 4 – Missing request for Sphere of Influence Amendment, as Petitioners indicated proposal “is not” consistent with SOI. • Item 11 – Didn’t answer question indicating what effort was made to obtain consent from affected public agency and why they didn’t act. • Missing petitioner’s signatures at bottom of form
Form L-2	<ul style="list-style-type: none"> • Missing physical address, registered voter count, Tax Rate Area, Land Use Zoning, Landowner position on petition

Apart from the fact that proponents failed, in the application circulated to agencies for comment, to address many elements at all, the information actually submitted by proponents on other elements is inconsistent or incomplete. Four points are of particular concern.

First, the application contains multiple inconsistent statements as to the purpose of forming the district, leaving it unclear what the proponents’ intent actually is. The annexation supplement asks “What is the purpose of the annexation?” to which proponents responded “See attached,” apparently referring to the roughly 100 pages that followed the application. Within those pages,

the purpose of the proposed district is described eight different times in different ways.⁴ The most candid statement of the “need” for the Tuscan Water District is in the petition description on page 13 of the annexation application PDF. The “need” for the new district is said to arise because there is no public infrastructure or subbasin-wide district with the “support of groundwater dependent landowners” to manage subbasin groundwater. In other words, a new water district is “needed” because a minority of residents (with large groundwater appetites) simply will not support management of subbasin groundwater through a district or agency they do not control. The notice of intent to circulate a formation petition that proponents filed with Butte LAFCo reiterates this point. Annexation Application, PDF page 17. A refusal to cooperate in democratic decision-making over groundwater management decisions is not a “need”; it is a “want.”

Second, Butte LAFCo’s annexation and formation applications both state LAFCo policy and ask a question:

Butte LAFCO policies allow an application by petition only when the applicant provides satisfactory evidence that a diligent effort has been made to obtain a Resolution of Application from the affected public agency. Please indicate what effort was made to obtain such consent and the reasons why the public agency did not act on the applicant’s request.

Annexation Application, PDF page 15; LAFCO form L-1.

<https://static1.squarespace.com/static/600886efd4535b44c90320be/t/6050f8d18fce83477d1e6f4c/1615919313726/Fillable+District+Formation+App.pdf>. Petitioners’ answer to this question in the annexation application was nonresponsive: “Landowners are initiating district formation by landowner petition and not by pursuing a Resolution of Application by an affected agency.” Annexation Application, PDF page 15. Stating that proponents “are not pursuing” a resolution of application” is not “satisfactory evidence [of] diligent effort” – it is the opposite: proponents admit they chose to ignore an express LAFCo agency formation requirement.

A resolution of application is a document adopted by a local agency initiating a change in organization. (Cal Gov’t Code § 56073.1). “Local agencies” include “a city, county or district.” (Cal Gov’t Code § 56054). Butte County has the authority to carry out all of the functions proposed to be served by the proposed Tuscan Water District, in several different ways: by delegation of GSP management authority to the Vina GSA, by delegating GSP management authority to the existing Department of Water Resources and Conservation, by creating a county water district (whose territory would include watersheds affecting county surface water resources) by resolution of application, or by creating a new county department and delegating GSP management authority to the new department. The Tuscan proponents did not, as LAFCo requires, make a diligent effort to secure the commitment of another county agency or

⁴ Tuscan Water District annexation application, PDF pages 13-14; 17; 18-19; 24-25; 28; 34-35; 53; 65.

department to meeting Tuscan’s supposed purpose before filing their petition. (Getting the assistance or encouragement of a county staff member does not meet this requirement). Each of the alternatives the Tuscan proponents chose to ignore would have placed ultimate control of the efforts in the hands of the Butte County Board of Supervisors, a democratically-elected body, or in the hands of representatives of that Board, the City Council of Chico, and the board of the Durham Irrigation District. If the application is not denied outright, it should be deferred for consideration until the Butte County Board of Supervisors gives thoughtful consideration to the use of existing agencies (including the Vina GSA) to perform the functions proposed by the Tuscan proponents. (*See 2 below*).

Third, the LAFCo district formation application requires as Exhibit 8 a “Plan for Services – Feasibility Study.” While the annexation application contains a section labelled “Plan for Services” (Annexation Application, PDF pages 26-27), the section does not contain a plan; it simply states in several different ways that a plan will be developed after the district is formed. No feasibility study (not even a deficient one) is included in the application. Petitioners’ professed ignorance as to what the district will do if formed is too cute by half. The landowners behind the Tuscan proposal have been conducting closed meetings of the AGUBC for *years*. Their members have involved themselves in the development of PMAs by the Vina GSA. The application proposes to limit Tuscan to performing PMAs that it selects from the PMA list to be finalized in the January, 2022 GSP. Surely proponents have a very good idea of which PMAs the AGUBC would back if the current PMA list were finalized. The LAFCo process requires proponents to disclose those choices, and to discuss their feasibility, costs and other implications. Among the items that should be addressed in a complete application are:

- If the Tuscan Water District is planning on acquiring Paradise Irrigation District surface water, what is the likely cost per acre-foot of that water, and will landowners within the Tuscan Water District be assessed for that purchase? What analysis been done on how such assessments would affect the economic viability of smaller farms in the proposed District?
- Will Tuscan Water District seek to acquire Table A water, and if so, with what infrastructure and at what cost? How would such water be used? How would the cost of such acquisition be passed on to District landowners? What analysis been done on how such assessments would affect the economic viability of smaller farms in the proposed District?
- At the Butte County Water Commission hearing, Sen. Brian Dahle’s representative stated in the public comments that the Senator believes Tuscan is needed to have a vehicle that can issue bonds to finance the construction of “water storage” infrastructure. This suggests Sen. Dahle has heard something from AGUBC that is not disclosed in the Tuscan Water District Application. Does Tuscan Water District contemplate constructing injection wells or other artificial recharge structures to move surface water into groundwater storage? What would such systems cost, considering in particular the

distance between sources of significant volumes of surface water and the proposed District boundaries?

- Surface water that is injected into an aquifer does not become shared “groundwater”; it remains the property of the owner that injected it. If Tuscan proposes to inject surface water into land within the District boundaries, how will the District determine who is pumping the “owned” groundwater out of the ground? Will such pumpers be charged for pumping the injected surface water? Wouldn’t such a scheme require meters on every well in the District? Will all District residents be required to put meters on their wells if injection wells are pursued?

As a substantive matter, the Tuscan Water District application is woefully inadequate. As a procedural matter, the *formation* application may not have been provided to the affected local agencies from which comments were solicited by LAFCo.

Finally, although the application mentions Paradise Irrigation District water as a potential surface water source (Annexation Application, PDF page 66), Paradise Irrigation District was not among the agencies to which notice of the application was given.

<https://static1.squarespace.com/static/600886efd4535b44c90320be/t/60edfc7bafefb59e6752da8/1626209404062/21-06+-+TWD+-+Initial+Notice.pdf>

Given the substantial omissions from the application materials made available on a timely basis to the public, to the Vina GSA and to other affected agencies, I urge the Vina GSA to conclude that it cannot at this time support the application to form the Tuscan Water District, and to so inform Butte LAFCo.

2. The Tuscan Water District Should Not Be Formed At This Time, As Alternative Solutions Have Not Adequately Been Considered.

As mentioned above, Butte LAFCo procedures require a new district applicant to show that “diligent efforts” have been made to get an existing agency to perform the services proposed in the district to be formed. The application is deficient because it fails to describe any such efforts.

The Butte LAFCo policy expressed in its district formation form is consistent with the notion that we should have no more government than is necessary; that agencies capable of exercising powers should exercise them rather than slough them off to newly-formed entities.

In addition, because the proposed Tuscan Water District will acquire powers over a *shared public resource*, preference should be given to management entities that are rooted in or responsible to elected bodies for which all registered voters can vote.

Everything that the Tuscan Water District proposes to do could be done by the Vina GSA. With assessments on Vina subbasin landowners, the GSA could hire the same sort of staff that the

Tuscan Water District will hire with its assessments to Tuscan Water District landowners. I can find no evidence in Vina GSA minutes that the Board has ever considered whether the GSA should implement its own GSP, or whether it considers its own GSP so complex that a new agency must be formed to execute it.

Similarly, various existing Butte County agencies (or a county water district formed by a Board of Supervisors Resolution of Application) could implement the Vina GSP.

Tuscan proponents argue that the County “has already decided it doesn’t want to do this.” This is untrue. A county *staffer* took it upon himself to suggest to the Tuscan proponents that they form a California water district, and he worked with them exclusively for years to put a small number of landowners far ahead of the pack in bidding to exercise outsized control over the groundwater in the County. A consent resolution that was never fully explained to the Board of Supervisors, and that was never the subject of voter input, does not constitute a decision “of the County” that it does not want to perform GSP functions.

The Tuscan Water District application should not be considered until the Butte County Board of Supervisors has engaged in fact finding, sought public comment, and voted on whether it wishes to decline to exercise the groundwater sustainability management responsibilities the Legislature has delegated to it in SGMA. All Butte County residents deserve a clear record on whether their Supervisors support ceding authority over a shared resource to fewer than 1,000 county landowners, rather than reserving such authority to popularly-elected city, county and district officials.

3. The Tuscan Water District Would Be Constitutionally Infirm.

The Vina GSA should not endorse the entry into Butte County’s groundwater compliance efforts a new, illegal entity.

California law provides for the formation of many different kinds of local districts managed by elected officials. California’s General Election Law supplies default rules for the election of persons who are responsible for carrying out the district’s purposes (trustees, directors, board members, etc.) The default rule, unless modified by the law enabling the district, is that elections are conducted on the basis of one vote to each adult citizen in the geographic territory covered by the district. By default, irrigation districts (such as Durham and Richvale) are one citizen/one vote. Other types of districts, such as water storage districts and reclamation districts, provide for voting (in different circumstances) based on acres owned within the district, the assessed value of land within the district, or the relative size of recent land value assessments by the district. (Cal. Water Code §§ 41001, 50704.) The type of district the Tuscan proponents propose to form is a “California water district.” Per the Water Code, California water districts elect trustees in elections in which each voter has one vote for each dollar’s worth of land to which he or she holds title. (Cal. Water Code § 35003.) The provision in the Water Code for California water districts and elections based on owned land value date back to 1913. At the time the California Legislature provided for such landowner voting in California water districts, case law

had not subjected such voting schemes to “equal protection” analysis. While no court to date has reached the issue, since the enactment of the Sustainable Groundwater Management Act (SGMA), Division 13 of the California Water Code (California Water Districts) has been unconstitutional.

A. “One Person, One Vote”

As a preliminary matter the fact that a law still appears on a State’s books does not mean that the law remains valid. States sometimes enact laws that are unconstitutional when they are made. Sometimes the law evolves, so that laws thought proper when enacted are later viewed as unconstitutional. Sometimes laws are said to be unconstitutional “as applied,” meaning that while they are facially acceptable, in a particular circumstance, application of the law leads to an unconstitutional result. Laws that are unconstitutional can remain on a State’s books for years before they are analyzed in a lawsuit and determined to be unconstitutional. The California Water District law under which the Tuscan Water District seeks to organize has become unconstitutional as federal law has evolved, and as the Legislature has strengthened the characterization of groundwater as a shared public asset.

Section 1 of the Fourteenth Amendment to the United States Constitution provides, in part, “No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.” In 1962, the Supreme Court of the United States held for the first time that this provision of the Constitution could be invoked in federal court to challenge state-level voting schemes that a voter alleged to deprive the voter of both due process and equal protection. *Baker v. Carr*, 369 U.S. 186, 237 (1962). *Baker* concerned the drawing of districts for election to the Tennessee legislature. The districts had been drawn in 1901, and in the intervening 60 years, district populations had changed dramatically, such that districts contained widely different numbers of voters. (“37% of the voters of Tennessee elect 20 of the 33 Senators awhile 40% of the voters elect 63 of the 99 members of the House.” *Id.*, 369 U.S. at 253 (concurrence of Clark, J.)). While the Court had previously decided cases on the propriety of the manner in which state legislatures drew lines for *Congressional* districts Art. I, § 4 of the Constitution (*see, e.g. Smiley v. Holm*, 285 U.S. 355, (1932)), it had not applied constitutional principles to how states designed or conducted elections for units of *state* government. The Supreme Court had, in previous years, declined to accept for review a number of cases involving constitutional challenges to state-adopted voting schemes (*see, e.g., Colegrove v. Green*, 328 U.S. 549 (1946)), decisions that the lower court in *Baker* read to signify that the Court believed state voting rules for state elected offices presented “political questions” that federal courts should not entertain.⁵

⁵ To honor the separation of powers between the three branches of government – the executive, the legislative and the judiciary – federal courts in the United States developed a practice of refusing to decide issues that were deemed “political questions,” on the theory that certain questions were within the exclusive province of the legislative or the executive branch. *Foster v.*

The Court held that “the mere fact the suit seeks protection of a political right does not mean it presents a political question.” *Baker*, 369 U.S. at 209. The *Baker* court concluded that federal courts *could and should* consider whether state voting schemes violated the Constitution, and it sent the case back to the trial court to do so.

In the years following the decision in *Baker*, the Supreme Court has applied the Equal Protection Clause to invalidate multiple state-adopted voting schemes that departed from “one citizen/one vote.” In *Reynolds v. Sims*, 377 U.S. 533 (1963) the Court invalidated an Alabama legislative districting scheme that created state senate districts with populations ranging from 15,417 to 634,864. (*Id.* at 546.) The Court noted that “the right of suffrage can be denied by a debasement or dilution of the weight of a citizen’s vote just as effectively as by wholly prohibiting the free exercise of the franchise” (*id.* at 555), and held that seats in a state legislature must be apportioned on a population basis. (*Id.* at 568.) In *Avery v. Midland County*, 390 U.S. 474 (1968), the Court extended its rulings to local governments, overturning a districting scheme in which the elected officials governing a county in Texas were elected from districts of substantially different populations (i.e., 414, 828, 852 and 67,906). (*Id.* at 476.) In *Hadley v. Junior College Dist.*, 397 U.S. 50 (1970), the Court first applied its “one citizen/one vote” reasoning to the governance of a special district, in that case, a community college district. The Court rejected an argument that equal apportionment was required only in “important: elections: “We . . . hold today that as a general rule, whenever a state of local government decides to select persons by popular election to perform governmental functions, the Equal Protection Clause of the Fourteenth Amendment requires that each qualified voter must be given an equal opportunity to participate in that election . . .” (397 U.S. at 56.)

Since 1968, the Court has issued decisions in a variety of cases invalidated voting schemes that departed from one citizen/one vote. *Kramer v. Union Free School Dist.*, 395 U.S. 621 (1969) (invalidating voting scheme for school board that limited voters to landowners, renters and parents of school district students)⁶; *Cipriano v. Houma*, 395 U.S. 701 (1969) (invalidating scheme limiting voting on municipal utility bond issuance to “property taxpayers”)⁷; *Phoenix v.*

Neilson, 27 U.S. (2 Pet.) 253 (1829) (refusing to entertain suit predicated on interpretation of treaty between the United States and Spain that differed from the executive’s interpretation.)

⁶ “[I]f a challenged state statute grants the rights to vote to some bona fide residents of requisite age and citizenship and denies the franchise to other, the Court must determine whether the exclusions are necessary to promote a compelling state interest. [¶] And, for these reasons, the deference usually given to the judgment of legislators does not extend to decisions concerning which resident citizens may participate in the election of legislators and other public officials. Those decisions must be carefully scrutinized by the Court to determine whether each resident citizen has, as far as is possible, an equal voice in selections.” 395 U.S. at 627.

⁷ “[F]encing out from the franchise a sector of the population because of the way they may vote is constitutionally impermissible.” 395 U.S. at 706 (*citing Carrington v. Rash*, 380 U.S. 89, 94 (1965)).

Kolodziejski, 399 U.S. 204 (1970) (invalidating Arizona constitutional and statutory provisions limited voting on general obligations bonds to real property taxpayers)⁸; *Hill v. Stone*, 421 U.S. 289 (1975) (invalidating voting scheme on tax bonds that treated property owning taxpayers and other registered voters differently); *Bd. of Estimate of City of New York v. Morris*, 489 U.S. 688 (1989).⁹ (board wielding non-legislative powers must follow “one person, one vote” principle because board’s powers are general enough and have sufficient impact throughout its district to require that elections to board meet equal protection requirements.)

The Court has decided two cases in which it held that local agencies that transported and stored *surface water* were not required to abide by the general rule that equal protection requires “one person, one vote.” In *Salyer Land Co. v. Tulare Lake Basin Water Storage Dist.*, 410 U.S. 719 (1973), the Court considered a 193,000 acre water storage district, 85% of which was farmed by four corporations, and in which only 77 people lived. The Court distinguished the decisions discussed above by reasoning that the districts there in issue either exercised “general governmental powers” (*Avery, Cipriano, Phoenix*) or performed important government functions, and had sufficient impact throughout their districts to fall within the rule set out in *Avery*. (*Kramer, Hadley*)¹⁰. The *Salyer* Court concluded, over a vigorous dissent, that the water storage district fell within an exception to “one person, one vote”, and denied a challenge to landowner voting. (*Id.* at 730.) In *Ball v. James*, 451 U.S. 355 (1981), the Court considered a challenge to the landowner voter scheme employed by the Salt River Project Agricultural Improvement and Power District, which delivered untreated water to landowners in a 236,000 acre district, and subsidized its costs of operation by selling electricity within and without the district. (*Id.* at 357, 370 n.18.) The Court noted that the Salt River Project’s water functions “are relatively narrow. The District . . . [does] not own, sell, or buy water, nor do they control the use

⁸ “Presumptively, when all citizens are affected in important ways by a governmental decision subject to a referendum, the Constitution does not permit weighted voting or the exclusion of otherwise qualified citizens from the franchise.” 399 U.S. at 209. “[T]he Court has said that in cases where public officials with legislative or other governmental power are to be elected by the people, the Constitution requires that the electoral franchise must generally reflect a regime of political suffrage based upon ‘one man, one vote.’” (399 U.S. at 215 (Dissent of Stewart, J., seeking to distinguish bond approvals from the election of public officials.)

⁹ *Morris* concerned the composition of the Board of Estimate of the City of New York, an agency that managed City property, granted City contracts, exercised zoning authority and shared power with the City Council to modify and approve budgets. The board was composed of three officials who were elected City-wide, and the borough presidents of each of New York City’s five boroughs. 489 U.S. at 690. The populations of those five boroughs, according to the 1980 census, ranged from 352,121 to 2,230,936. *Morris v. Board of Estimate*, 592 F.Supp. 1462, 1465 (E.D.N.Y 1984). The Court held that the disproportional voting structure did not survive strict scrutiny, “in part because the valid interests of the city [in using the existing structure] could be served by alternative ways of constituting the board that would minimize the discrimination in voting power among the five boroughs.” 489 U.S. at 703.

¹⁰ *Morris*, decided sixteen years after *Salyer Land*, also illustrates this rule.

of any water they have delivered. The District simply stores water behind its dams, conserves it from loss, and delivers it through project canals.” (*Id.* at 367.) All water delivered by the District was “distributed according to land ownership, and the District does not and cannot control the use to which the landowners who are entitled to the water choose to put it.” (*Id.* at 367-68.) By a 5-4 vote, the majority in *Ball* concluded that the District’s voting scheme was constitutional.

The rule derived from these Supreme Court cases is that if a local agency either exercises governmental powers OR serves an important government function with widespread impact, the manner in which its directors are elected is subject to strict scrutiny Equal Protection analysis, in which any departure from “one person, one vote” must be in service of a compelling state interest, and must be narrowly tailored to meet that interest. *Kramer*, 395 U.S. at 633.

Importantly, the Supreme Court of the United States has *never* endorsed landowner voting for any local agency exercising control over groundwater, and has never considered whether groundwater management responsibilities assigned to a local agency by a state Legislature constitute “governmental powers.” Thus, it is simply incorrect to state that the California water district structure advocated by the Tuscan proponents has been found to be constitutional.

B. Tuscan’s powers would be governmental, and it proposes to perform governmental functions affecting many people in the district ineligible to vote for its directors.

Division 13 of the California Water Code confers on California water districts a number of legislative and regulatory powers. They include:

- The power to establish equitable rules and regulations for the sale and distribution of water, including the power to withhold water from those who violate the rules. (Water Code §35423)
- Criminal sanctions for violation of the equitable rules and regulations adopted by the district (Water Code § 35424).
- To power to establish preferences for water users in the event of a water shortage (Water Code § 35453).
- The power to require owners of irrigated land proposed to be planted to annual crops or new plantings to take reductions in water use when available water is inadequate to serve all district irrigated land (Water Code § 35454).
- The power to determine, in inadequate supply years, water entitlements for types of crops and to limit the acreage planted to such crops. (Water Code §35454.5).

These powers are plainly legislative and governmental. Approximately 6,500 people reside in the territory covered by the Tuscan Water District. Some of those residents are not landowners,

and they are excluded from voting under the landowner voter scheme. In addition, given the distribution of landownership in the proposed district, a small minority of district residents could exercise complete control over the election of all of the proposed district's trustees. The landowner voter scheme, when challenged, would be analyzed for Equal Protection purposes under a strict scrutiny standard. It simply will not survive.

This conclusion is even clearer when the impact of SGMA is considered. SGMA declared groundwater management to be subject to the principles set out Section 2 of Article X of the California Constitution.¹¹ (Water Code § 10720.5(a).) The Legislature explicitly declared that it was the intention of the *Legislature*, in enacting SGMA “[t]o provide for the sustainable management of groundwater basins” (Water Code § 10720.1(a)) and “[t]o manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner.” (Water Code § 10720.1(h).) The Legislature left counties responsible for groundwater management in areas not covered by a groundwater sustainability agency (Water Code § 10724(a)), and explicitly granted groundwater sustainability agencies legislative and regulatory powers. (Water Code §§ 10725 *et seq.*) In other words, the Legislature established a *State* objective, and delegated to counties and local agencies the legislative authority to adopt ordinances and regulations to achieve the State's groundwater objectives in different locales. The powers exercised by such counties and agencies are obviously both legislative and governmental in nature.

The argument can thus be made that following the adoption of SGMA, the governance structure of any elective local agency exercising control over groundwater is subject to strict scrutiny Equal Protection analysis. For this additional reason, the Tuscan Water District's method of electing trustees would be invalid.

C. The Tuscan Water District's exercise of powers would affect a large number of people outside its territory.

If Tuscan is to implement Vina GSA PMAs in service of sustaining the groundwater in the Butte subbasin, its actions will necessarily affect primarily persons living *outside* the proposed district territory. The same subbasin underlies Chico as underlies the Tuscan territory. The proposed district is said to have about 6,500 residents. Groundwater-dependent Chico alone has 110,000. City of Chico voters will have no say whatsoever in the election of trustees who will decide (on the basis of the relative assessed value of their land) on projects affecting the City of Chico groundwater supply. Apart from the obvious point that it is horrible public policy to hand control over decisions with respect to a shared public resource to a tiny fraction of the affected

¹¹ “[T]he general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof *in the interest of the people and for the public welfare.*” (emphasis added).

population, this mismatch of eligible voters and affected persons runs afoul of both the Due Process and Equal Protection Clauses of the Fourteenth Amendment.

In view of the constitutional infirmity of the proposed Tuscan Water District, and the fact that it would be a horrible public policy choice to afford a small minority of residents oligarchical control of a public resource shared by 140,000 residents, I urge the Vina GSA to advise Butte LAFCo that it opposes the application to form the Tuscan Water District.

4. Formation of the Tuscan Water District Would Interfere With SGMA's Requirement That All Interested Parties Participate in the Implementation of a Groundwater Sustainability Plan.

SGMA directs that in formulating GSPs, GSAs “shall encourage the active involvement of diverse social cultural and economic elements of the population within the groundwater basin prior to and the during the development *and implementation* of the groundwater sustainability plan.” (Water Code § 10727.8(a) (emphasis added.) The Vina GSA has undertaken efforts to solicit input from users other than the largest agricultural groundwater users. While its GSP is not yet complete, the Vina GSA has published a draft list of PMAs, most of which are low-cost conservation measures. Of the PMAs listed, I surmise (based on the contents of the original Tuscan Water District application and the outright refusal of the proponents' public relations personnel to answer direct questions) that the Tuscan proponents are primarily interested in (a) acquiring Paradise Irrigation District water rights, and constructing a pipeline to Chico so that Cal Water can reduce its groundwater draw, leaving more available for large scale agriculture, and (b) acquiring surface water from some unidentified other source (Table A?) and engaging in artificial recharge by pumping surface water into the aquifer.

Probably 140,000 Butte County residents are the “population within the groundwater basin” whose input the GSP is required to consider. Those residents may differ in their views from the County's largest farmers on the question of what should happen with PID, whether funds should be expended to build a pipeline, and whether surface water, wherever obtained, should be injected into the aquifer on which virtually all 140,000 residents depend for their water. There are legitimate concerns that “exercising” the aquifer with artificial recharge could, in time, result in the loss of groundwater-dependent environments outside the boundaries of the proposed district. There are at most 1,000 persons who can control the direction of the proposed Tuscan Water District. If the Tuscan is approved, those 1,000 people can vote to approve and finance the construction of projects, including projects to which there could be *near-universal popular opposition*. The Tuscan Water District represents an improper attempt to avoid the shared control of groundwater sustainability decision-making that SGMA was intended to establish.

Because formation of the Tuscan Water District would interfere with the balance struck by the Vina GSA in considering stakeholder input to the Vina GSP, I urge the Vina GSA to advise LAFCo that formation of the Tuscan Water District would hinder the subbasin's implementation of its GSP, and that for that reason, the Vina GSP opposes the application to form the Tuscan Water District.

5. Formation of the Tuscan Water District Could Waste Valuable Planning and Implementation Time In Achieving Groundwater Sustainability.

If LAFCo approves the formation of Tuscan Water District as an unconstitutional California Water District, such action would inject an illegal entity into the center of efforts in Butte County to make progress toward groundwater sustainability goals. If Tuscan’s formation or its role in implementing the Vina GSP is challenged in litigation, that litigation will likely not be finally resolved for between two and four years. If, as is likely, Tuscan is found several years in the future to have an unconstitutional election structure, all of the actions Tuscan has taken in the intervening time – the elections of its trustees, the collection of assessments from landowners to fund its operations, the formation of contracts with respect to water rights – could be invalidated. If implementation of groundwater sustainability efforts must be restarted from scratch in the future, years of execution time will be lost in the effort to achieve state-mandated groundwater sustainability.

For this additional reason, I urge the Vina GSA to advise Butte LAFCo that it opposes the application to form the Tuscan Water District.

* * *

The 139,000 Vina subbasin residents who have not come out in support of the Tuscan Water District are legitimately concerned that the Tuscan Water District would be an unnecessary interloper into an ongoing GSA process, that it would serve to thwart the legitimate interest of non-agricultural stakeholders in the Vina GSA’s GSP implementation, and that its questionable legal status risks significant disruption of Butte County’s groundwater sustainability efforts for years into the future. For those reasons, the Vina GSA should oppose or decline to support the formation of the Tuscan Water District.

Thank you for your consideration of these lengthy comments.

Sincerely,

James F. McCabe

Item 8.1.a.

Culligan of Chico
Sierra Water Utility

Durham Irrigation District
Water Operator Log

Month:	August 2021			
Date	Task Description/Notes	Regular Hrs and Duties (M-F)	Additional Hrs (above 58hrs*/month)	After Hrs
8/1/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/2/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/3/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/4/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/5/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/6/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Added 21 gallons to Library site. Added 26 gallons to Holland site. Topped oil of at Library site.	2.00		
8/9/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Cleaned Library and Holland sites.	2.00		
8/10/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/11/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Collected monthly bacteria samples and yearly disinfection byproduct samples. Processed and delivered to Basic Lab, Inc.	2.00		
8/12/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/13/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Topped Oil off at Library and Holland site.	1.75		
8/14/21	Met with JC Hernandez to clean alleys, Alley site, and ivy patch behind Alley site for upcoming repair.	1.00		
8/16/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/17/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Added 31 gallons to Library site. Changed tube at Library site.	2.00		
8/18/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/19/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/20/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/23/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Cleaned Library site. Located lost valves.	2.00		

Date	Task Description/Notes	Regular Hrs and Duties (M-F)	Additional Hrs (above 58hrs*/month)	After Hrs
8/24/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Added 36 gallons to Library site. Cleaned located valve boxes. Exercised valves to verify functionality.	2.00		
8/25/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Hung notices for repairs scheduled Thursday.	2.00		
8/26/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Responed to reported leak behind Durham Country Market. Customers side of the pipe had a pinhole leak that was causing flooding. Isolated leak and coordinated with tenants to have a plumber come repair the line. Met with Brown Engineering to repair service line leak of Goospeed. 2 inch service line had a leaking fitting from a past repair. Isolation valve at main doesn't work. Installed new isolation valve and repaired leak. Installed new valve box for isolating property.	8.00		
8/27/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Installed new valve box for isolating property.	1.75		
8/30/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak.	1.75		
8/31/21	Performed daily checks, checked lubrication of all pumps. Checked progress of Brown-Faber leak. Hung notices for repairs scheduled Wednesday/	2.00		
Subtotal Regular Hours		49.50		
Date	METER READING (assumes meter reading approx. 10 hrs/month)*			
	Meter Reading	10.00		
Subtotal Meter Reading		10.00		
TOTAL REGULAR HOURS		59.50		
Total Additional Hours (above 50hrs/month)			0.00	0.00
		Total Hrs	59.50	
Signature:	<i>Michael Butler</i>	After Hrs		
Title:	Operator			

RESOLUTION
OF
THE BOARD OF DIRECTORS OF
DURHAM IRRIGATION DISTRICT
TO SUBMIT PROPOSED INITIATIVE MEASURE
TO VOTERS PURSUANT TO
ELECTIONS CODE SECTION 9310

WHEREAS, despite the numerous false statements and misrepresentations contained and published therein, a Proposed Initiative Measure to repeal the Water Rate Increases adopted by the Board of Directors of Durham Irrigation District on January 1, 2019 has been certified by the Butte County Clerk-Records/Registrar of Voters as having received a sufficient number of verified and valid signatures (103), or 12 more than required to qualify it as being sufficient; and,

WHEREAS, by reason thereof and pursuant to California Elections Code Section 9310, the Board of Directors of the District must either adopt the Proposed Initiative as an ordinance without alterations, or submit the Proposed Initiative, without alterations, to the voters of the District; and,

WHEREAS, the Board of Directors of the District by letter dated January 20, 2021 called to the attention of the Clerk-Recorder/Registrar of Voters the numerous false statements and misrepresentations contained in the circulation, publication, and obtaining of signatures of the Proposed Initiative; and,

WHEREAS, the County Clerk-Recorder/Registrar of Voters has advised that its duty with respect to Proposed Initiatives, including the Proposed Initiative, is limited pursuant to Election Code Section 9114 to ascertaining whether or not they have been signed by the requisite number of voters, which, with respect to the Proposed Initiative, it found that it had; and,

WHEREAS, due to the many repairs and replacements it needs to make to its infrastructure, the District lacks the financial resources to seek a Writ of Mandamus or take other legal action to remove the Proposed Initiative from the ballot of District voters at the next election,

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the District requests the Clerk-Recorder/Registrar of Voters to submit the Proposed Initiative, without alterations, to the voters of the District pursuant to California Election Code Section 1405; and,

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BE IT FURTHER RESOLVED, that the Board of Directors respectfully requests that for the same reasons that the District cannot seek a Writ of Mandamus or otherwise seek to remove the Proposed Initiative from the ballot, the Clerk-Recorder/Registrar of Voters itself incur the cost and expense of placing the Proposed Initiative on the ballot and not charge to or assess the District such cost and expense.

ADOPTED this 21st day of September 2021 by the following vote of the Board of Directors:

AYES: Doyle, Cooper, Phillips

NAYS: None

ABSTAIN: None

ABSENT: None

Durham Irrigation District

Matt Doyle, Chair

ATTEST:

Kevin Phillips, Secretary

STATE OF CALIFORNIA
NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF REGIONAL ASSISTANCE
NORTHERN REGION OFFICE



**An Investigation of Groundwater Quality Impacts from a
Catastrophic Urban Wildfire Event in Paradise California.**

June 2021

This report was prepared under the supervision of

Teresa Connor Chief, Northern Region
Aric Lester Chief, Environmental Assessment Branch
Scott McReynolds Chief, Water Quality Section

By

Evan MacKinnon Environmental Scientist
Sarah Benjaram Scientific Aid

Technical Information Record (TIR) – NRO-2021-07

This Technical Information Record is a working document subject to revision or replacement. Its purpose is to summarize the results of a water quality investigation of potential fire-related groundwater pollution in Paradise and surrounding communities.

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Summary

This report summarizes groundwater quality data collected as a component of the Department of Water Resources (DWR) investigation of potential groundwater pollution resulting from the 2018 Camp Fire in Paradise, California. Groundwater was sampled from 12 wells in Paradise and surrounding communities and analyzed for fire-related pollutants. Each well was sampled twice, once in the spring of 2019, and again in the winter of 2020/21. Groundwater samples were analyzed for polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), benzene, gas and diesel range organics, trace elements including heavy metals, nutrients, and general water chemistry. No evidence of fire-related groundwater pollution was found in or around the City of Paradise in the two years following a catastrophic wildfire event. However, groundwater contamination from wildfire is site-specific and remains a legitimate risk that should be integrated into existing and future post-fire remediation plans. This study did not assess surface water impacts from wildfire or fire-related deterioration of drinking water distribution infrastructure.

Groundwater contamination is an underemphasized but potentially very serious consequence of urban wildfires, which not only consume vegetation biomass but also a multitude of hazardous human-derived fuels. Post-fire recovery includes many public safety and environmental health challenges, and groundwater resources protection would be a wise component of coordinated post-fire remediation plans. Measures aimed at protecting groundwater resources help to identify and prevent long-term and sometimes irreversible pollution of aquifers, and routine post-fire groundwater quality monitoring serves to alert public water users of drinking water hazards following wildfire.

Groundwater quality investigations help DWR assess water quality changes, maintain partnerships through technical assistance, and promote regional water management and sustainability. Post-fire groundwater quality monitoring is consistent with the *California Water Action Plan* and the *Department of Water Resources Strategic Plan* that promote reliable and sustainable water for humans and the environment. This effort also supports the *California Water Resilience Portfolio Initiative*, which directs government agencies to recommend priorities and actions for meeting California's future water supplies.

Introduction

The Camp Fire, which occurred in November 2018, is the deadliest wildfire in California recorded history. It consumed over 150,000 acres and destroyed over 18,000 residential and commercial structures. Urban wildfires like the Camp Fire are distinct from traditional wildfires that primarily affect wildlands. Urban wildfires instead consume large quantities of building materials, insulation, electrical systems, vehicles and fuel, plastics, and countless household and industrial chemicals. These fuels leave behind untold quantities of potentially hazardous residues and combustion byproducts.

Wildfire can create long-term environmental contamination, especially of waterbodies (Stein and Brown 2009). Combustion byproducts include nutrients like phosphorus and nitrogen-based compounds and various metals. Wildfire ash contains PAHs, which are carcinogenic compounds released when organic material burns (Austin et al. 2001; Mansilha et al. 2020). Wildfires affecting urban areas can release PCBs, which are compounds found in many man-made structures, electrical systems, and plastic products (Stein and Brown 2009). Wildfire can also physically damage municipal water distribution systems, causing pipes made of PVC to release carcinogenic benzene into drinking water (California Council on Science and Technology 2019; Montana Department of Environmental Quality 2012). Various chemicals associated with fire retardants used during fire suppression activities may also enter waterbodies (Kalabokidis 2000).

The impacts of wildfire on groundwater resources is understudied and largely unknown (Mansilha et al. 2014, 2020; Dimitriadou et al. 2018). Post-fire studies typically focus on landscape-scale hydrological alterations and sediment transport (Stein and Brown 2009; Bart and Tague 2017), on post-fire hazards like debris flows and flooding (U.S. Geological Survey 2005), or on impacts to air quality (Wu et al. 2006). When water quality is a component of post-fire research, the scope is usually limited to sediment loads and organic material impacts to surface waterbodies and aquatic ecosystems, as opposed to the numerous other water pollutants associated with fire (Stein and Brown 2009; Smith et al. 2011; Nunes et al. 2017). Additionally, most post-fire research examines traditional wildland fires that burn plant biomass in mostly unpopulated watersheds or landscape catchments; very different from the urban wildfires that have affected California in recent years (Smith et al. 2011; Mansilha et al. 2014; Nunes et al. 2017; Giambastiani et al. 2018).

The uncertainty surrounding wildfire-related groundwater contamination prompted DWR to investigate this topic in communities impacted by the Camp Fire. Available research suggests that groundwater vulnerability to wildfire contamination is variable and depends on fire characteristics, fuels composition, hydrogeomorphology, and post-fire precipitation events (Mansilha et al. 2020; Dimitriadou et al. 2018). Some studies have shown elevated PAHs, sulfate, nitrogen, and some metals in local groundwater supplies following wildfire (Mansilha et al. 2020), as well as fire-related changes in surface water/groundwater interactions (Bart and Tague 2017). Other studies, however, have shown no fire-related impacts to regional aquifers (Dimitriadou et al. 2018). One study even demonstrated that reduced evapotranspiration from vegetation losses following wildfire caused an increase in recharge rates and dilution of a contaminant already present in a downgradient aquifer (Giambastiani et al. 2018). Due to this remarkable variability, DWR endeavored to gain a clearer understanding of how the Camp Fire may be affecting groundwater resources for Paradise and surrounding communities.

The primary implication of this investigation is an increased awareness of the potential human health and safety threats associated with water quality and wildfire. Once contaminants enter groundwater, detrimental effects can be long term and irreversible, or require costly remediation technology (Sunitha et al. 2012; Scherer et al. 2000). This makes post-fire groundwater quality monitoring a prudent public

safety measure. Monitoring provides data to support necessary precautions, such as purchasing water or installing in-line water filtration systems. Monitoring data from this study will alleviate some of the ambiguity and regional variability associated with post-fire groundwater contamination. Data may also be used to prioritize post-fire cleanup measures and best management practices for preserving water quality.

The goal of this investigation is to promote an awareness and to achieve a clearer understanding of the potential threats to groundwater quality following wildland or urban wildfires. The three objectives of the study are to:

1. Identify potential sources and vectors of wildfire-related groundwater pollution.
2. Collect groundwater samples to assess contaminant levels in and around Paradise.
3. Introduce groundwater quality preservation as an important component to existing post-fire cleanup measures and water quality best management practices.

Methods

In February 2019, DWR geologists and environmental scientists performed a reconnaissance effort to document contaminant sources and identify possible pathways for polluted runoff to enter regional groundwater reserves. This effort consisted of assessing damage to domestic groundwater wells and evaluating the likelihood that these damaged wells could contribute to groundwater contamination. This effort also identified other potential areas of surface water infiltration, such as damaged septic systems.

Staff at DWR consulted with other water quality experts at the State Water Resources Control Board and at Lawrence Berkeley National Laboratory to develop a water quality parameter suite based on the pollutants most likely to be encountered following a wildfire (Table 1). This parameter suite included PAHs, which are carcinogenic combustion byproducts; PCBs, which are carcinogenic chemicals derived from various man-made products; benzene, a carcinogenic petroleum-derived chemical reported from another post-fire monitoring effort (California Council on Science and Technology 2019); and gas and diesel from petroleum sources consumed during the Camp Fire. Also sampled were trace elements including heavy metals; and nutrients like phosphorus and nitrogen compounds, which can be present in ash from both natural and man-made sources. General water chemistry samples were collected as well, including common minerals and ions, specific conductance, suspended solids, and alkalinity.

Groundwater samples were collected from three different types of groundwater wells (Fig. 1, 2). Within Paradise city limits, wildfire damage was so severe that no working well pumps were available to use. Instead, 1.5-inch diameter monitoring wells were sampled using either a sampling bailer device or a drill-powered peristaltic pump. Downgradient from Paradise in Butte Creek Canyon, several domestic wells remained intact and could be sampled directly from a functioning spigot. Further downgradient in the town of Durham, three municipal supply wells service the surrounding community, making these the most logical target for groundwater sampling in this area. Each well was sampled twice; the first sampling event occurred in the spring of 2019, and the second sampling event occurred during the winter of 2020/21. Monitoring well depths ranged from 13-24 feet deep; domestic wells ranged from 50-110 feet deep; and municipal supply wells ranged from 275-395 feet deep.

When using functioning well pumps, measures were taken to ensure that samples were representative of the aquifer and unaffected by contaminants associated with water distribution lines. Samples were collected from a point in the distribution system before any in-line filter or water softening system, and as close as possible to the well-head. A full well purge prior to sampling was not feasible; however, all domestic wells sampled were at occupied residences where the water system was in continuous use. Similarly, municipal supply wells were sampled after the system had been running for several minutes.

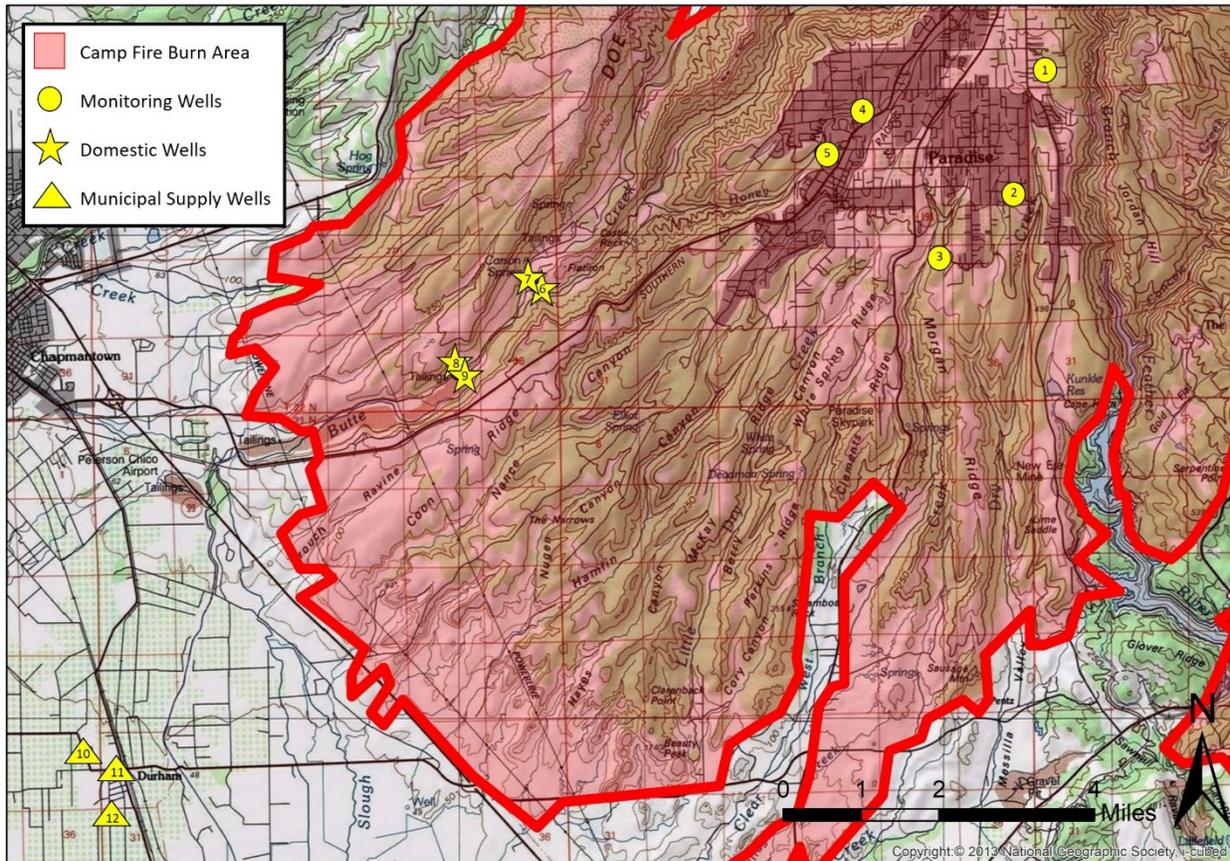
Water quality samples were collected according to DWR's *Standard Operating Procedure for the Collection of Water Quality Samples for Laboratory Analysis* (California Department of Water Resources 2019). Analyte-specific collection methods were applied, and samples were transported to three analytical labs within sample hold times. Blank samples were collected on multiple occasions to ensure proper sample handling and field filtration methods were implemented.

Table 1 Post-Fire Groundwater Quality Laboratory Analysis Group

Water Quality Parameter	Analytical Method	Impairment	Source	Treatment Options	Threshold	Reporting limit			
General Water Chemistry									
Total suspended and dissolved solids (mg/l)	SM 2540C	Possible taste/odor impacts; potential impacts to conveyance infrastructure and water treatment processes; water purity.	Natural sources from dissolution of geological deposits as well as anthropogenic sources.	Water softening systems; carbon filtration systems; distillation, reverse osmosis, or ion exchange filtration systems; pH neutralizing systems.	1000mg/l**; 450mg/l***	1 mg/l			
Alkalinity (mg/l)	SM 2320B				None	1 mg/l as CaCO ₃			
Total and dissolved hardness (mg/l)	EPA 2340B				None	1 mg/l as CaCO ₃			
Total and dissolved calcium (mg/l)	EPA 200.7				None	1 mg/l			
Total and dissolved magnesium (mg/l)	EPA 200.7				None	1 mg/l			
Dissolved sodium (mg/l)	EPA 200.7				30mg/l**; 69mg/l***	1 mg/l			
Dissolved potassium (mg/l)	EPA 200.7				None	0.5 mg/l			
Dissolved sulfate (mg/l)	EPA 300				500mg/l**	1 mg/l			
Dissolved chloride (mg/l)	EPA 300				500mg/l**; 106mg/l***	1 mg/l			
Dissolved boron (mg/l)	EPA 200.7				0.7mg/l***	0.1 mg/l			
Dissolved carbonate, bicarbonate, and hydroxide (mg/l)	SM 4500-CO2D				None	0.1 mg/l			
Specific conductance (µS/cm)	SM 2510-B				1600µS/cm**; 700µS/cm***	1 µS/cm@25°C			
pH (pH units)	SM 2320B				6-10**	0.1 pH Units			
Nutrients									
Total ammonia as nitrogen (Ammonia) (mg/l)	EPA 350.1	Concern for aquatic habitat degradation; can lead to taste/odor issues in drinking water sources.	Fertilizers; organic wastes in sewage and industrial effluent; natural deposits in some sediments; atmospheric deposition.	Carbon, distillation, reverse osmosis, or ion exchange filtration systems.	1.5mg/l**	0.05 mg/l as N			
Total Kjeldahl nitrogen (mg/l)	EPA 351.2				None	0.047 mg/l			
Total organic nitrogen (mg/l)	EPA 351.2				None	0.38 mg/l			
Dissolved nitrate as nitrate (mg/l)	EPA 300				45mg/l*	0.016 mg/l			
Dissolved nitrate + nitrite (mg/l)	SM 4500-NO3-F				10mg/l*	0.016 mg/l			
Dissolved orthophosphate (mg/l)	EPA 365.1				None	0.016 mg/l			
Total phosphorus (mg/l)	EPA 365.4				None	0.01 mg/l as P			
Total and dissolved organic carbon (mg/l)	EPA 415.1				None	0.5 mg/l as C			
Trace elements and metals									
Total and dissolved copper (µg/L)	EPA 1638				Potential toxins and carcinogens.	Occur naturally in soils and rock; some mining and industrial activities can increase environmental concentrations.	Catalytic activated carbon filtration systems; coagulation and filtration; distillation, reverse osmosis, or ion exchange filtration systems.	1,300ug/l*; 1,000ug/l**	0.001 mg/l
Total and dissolved aluminum (µg/L)	EPA 1638	1,000ug/l*; 200ug/l**; 5,000ug/l***	0.02 mg/l						
Total and dissolved cadmium (µg/L)	EPA 1638	5ug/l*; 10ug/l***	0.001 mg/l						
Total and dissolved chromium (µg/L)	EPA 1638	50 ug/l* (total); 10 ug/l* (VI)	0.001 mg/l						
Total and dissolved arsenic (µg/L)	EPA 1638	10ug/l*; 100ug/l***	0.001 mg/l						
Total and dissolved iron (µg/L)	EPA 1638	300ug/l*; 5,000ug/l***	0.005 mg/l						
Total and dissolved lead (µg/L)	EPA 1638	15ug/l*; 5,000ug/l***	0.001 mg/l						
Total and dissolved manganese (µg/L)	EPA 1638	50ug/l**; 200ug/l***	0.005 mg/l						
Total and dissolved nickel (µg/L)	EPA 1638	100ug/l*; 200ug/l***	0.001 mg/l						
Total and dissolved selenium (µg/L)	EPA 1638	50ug/l*; 20ug/l***	0.001 mg/l						
Total and dissolved silver (µg/L)	EPA 1638	100ug/l**	0.001 mg/l						
Total and dissolved zinc (µg/L)	EPA 1638	5,000ug/l**; 2,000ug/l***	0.005 mg/l						
Mercury (mg/l)	EPA 245.1	2ug/l*	0.00012 mg/l						
Volatile Organic Compounds									
Benzene (µg/L)	EPA 8260B	Potential toxins and carcinogens.	Combustion byproducts, petroleum fuel from spills or leaking storage tanks.	Carbon filtration systems.	1ug/l*; 170ug/l**	0.27 ug/l			
Polycyclic aromatic hydrocarbons (µg/L)	EPA 8270C				Many				
Gasoline range organics (µg/L)	EPA 8015B				5ug/l**	30 ug/l			
Diesel range organics (mg/l)	EPA 8015B				0.1mg/l**	0.022 mg/l			
Polychlorinated biphenyls	EPA 8082	Carcinogen; potential nervous system, organ, and reproductive issues.	Industrial lubricants and insulators, pesticide dispersant. Banned in 1979.	Carbon filtration systems.	0.05 ug/l (total)	0.03 - 0.18 ug/l			

Notes. SM = standard method. EPA = Environmental Protection Agency. Thresholds obtained from the State Water Resources Control Board's Water Quality-Based Assessment Thresholds table, which combines recommended water quality standards from various sources (State Water Resources Control Board 2021). Only drinking water maximum contaminant levels (*), taste and odor thresholds (**), and agricultural water quality goals (***) are shown in Table 1; however, additional criteria exist to protect other beneficial uses of water.

Figure 1 Distribution of Three Types of Groundwater Wells



Notes: Monitoring wells (circles; 13-24 feet deep) were sampled within the Paradise city limits, because most well pumps were damaged and non-operational in this area. In Butte Creek Canyon, some domestic wells (stars; 50-110 feet deep) were left undamaged by the fire and could be sampled using an intact well pump. Downgradient water users in Durham were best represented by sampling municipal supply wells (triangles; 275-395 feet deep). All monitoring wells were in burned areas, while municipal supply wells and three of the four domestic wells were in unburned areas.

Figure 2 Sampling Sites for Three Types of Groundwater Wells



Notes: Monitoring wells (A), domestic wells (B), and municipal supply wells (C) were sampled during this monitoring effort.

Results and Discussion

The reconnaissance survey suggested there is a potential for post-fire groundwater contamination. Damaged wells and septic systems were the primary features identified as possible vectors of groundwater contamination (Fig. 3). Wildfire physically damages domestic wells and septic systems, including PVC distribution pipes, pressure tanks, and various other rubber and plastic components. Thus, these are not only potential sources of pollutants (combusted residues and septic fluid) but create openings for polluted runoff to pool and percolate into the ground. However, natural landscape catchments, ephemeral stream channels, and other topographic features were also observed; and these likely play a much larger role in determining how much precipitation leaves the system as runoff, and how much is absorbed by the ground.

Figure 3 Possible Vectors for Groundwater Contamination in Paradise



Notes. During a field reconnaissance survey, DWR staff identified damaged wells (A) and damaged septic systems (B) as potential pathways for contaminated surface water to infiltrate groundwater.

Despite observed sources of contamination, two years of post-fire water quality monitoring failed to reveal widespread fire-related groundwater quality impacts (Table 2, 3, and 4). Only one well (22N03E26A001M, Table 2) had a detectable concentration of hydrocarbon pollution in the diesel C13-C22 carbon range in 2019; but this parameter was below the laboratory detection limit when the well was resampled in 2021. Absence of widespread or persistent fire-related groundwater pollution could be due to an impermeable layer of rock, clay, or unsaturated substrate that has prevented contaminant infiltration, or because pollutants were mobilized by surface water and left the local hydrological system during post-fire rain events (Dimitriadou et al. 2018). Alternatively, pollutants may have combusted completely or volatilized, leaving the area as a gaseous state or as oxidized particulates released into the atmosphere.

Some water quality parameters were above established human health thresholds (State Water Resources Control Board 2021). However, these are associated with the natural condition of groundwater in the region and are unrelated to wildfire impacts. For example, arsenic is a naturally occurring contaminant, and elevated levels in some wells is likely attributed to the volcanic geology of the region. Similarly, elevated concentrations of iron and manganese encountered at some wells are most likely due to underlying geology.

Table 2 Analytical Results for Paradise Monitoring Wells

Well Number and Location	22N03E15P001M		22N03E24H001M		22N03E26A001M		22N03E15A001M		22N04E07L001M	
	19.5		24		16		13.5		18.5	
Well Depth (feet)										
Sampling Events	Mar. 2019	Mar. 2021								
General Water Chemistry										
Solids (T) mg/L	88	88	47	170	NA	180	54	65	61	75
Suspended Solids (T) mg/L	NA	NA								
Alkalinity (T) mg/L as CaCO3	29	28	23	16	NA	57	21	16	28	36
Hardness (D) mg/L as CaCO3	44	NA	25	NA	NA	NA	27	NA	37	NA
Calcium (D) mg/L	8.27	NA	4.08	NA	NA	NA	5.64	NA	8.03	NA
Magnesium (D) mg/L	5.64	NA	3.55	NA	NA	NA	3.25	NA	4.16	NA
Sodium (D) mg/L	5.38	NA	2.24	NA	NA	NA	3.69	NA	4.51	NA
Potassium (D) mg/L	1.12	NA	0.654	NA	NA	NA	0.593	NA	0.554	NA
Sulfate (D) mg/L	2	2	1.2	0.99	NA	0.61	2.01	1.8	12	8
Chloride (D) mg/L	9.23	8.4	2.61	2	NA	2.4	5.03	4.9	4.45	4.9
Boron (D) mg/L	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA
Specific Conductance $\mu\text{S}/\text{cm}@25^\circ\text{C}$	122	300	66	74	NA	130	75	110	102	130
pH pH Units	6.6	7.3	6.4	7.4	NA	7.3	6.5	7.1	6.6	7.1
Nutrients										
Ammonia (D) mg/L as N	ND	ND	ND	ND		ND	ND	ND	ND	ND
Ammonia (as N) (mg/l)	ND	ND	ND	NA	0.13	ND	ND	ND	ND	ND
Total Kjeldahl Nitrogen (mg/l)	1.3	0.29	ND	0.3	ND	ND	ND	1.2	ND	0.11
Nitrogen, Organic (mg/L)	NA	NA								
Nitrate (D) mg/L	16.5	NA	6.6	NA	NA	NA	7.83	NA	3	NA
Nitrate Nitrite as N (mg/l)	NA	3.4	NA	1.3	NA	0.46	NA	2.8	NA	1.7
Nitrate + Nitrite (D) mg/L as N	2.81	NA	1.37	NA	NA	NA	1.88	NA	0.635	NA
Ortho-phosphate (D) mg/L as P	NA	0.0092	NA	ND	NA	0.016	NA	ND	NA	0.0095
Phosphorus (T) mg/L as P	0.486	0.13	0.03	0.13	NA	0.035	0.015	0.23	0.098	0.073
Organic Carbon (D) mg/L as C	ND	NA	ND	NA	NA	NA	ND	NA	0.9	NA
Organic Carbon (T) mg/L as C	6	0.41	ND	0.38	NA	0.18	ND	0.72	1	0.92
Volatile Organic Compounds and PAHs										
Benzene ($\mu\text{g}/\text{l}$)	ND	ND								
Acenaphthene ($\mu\text{g}/\text{l}$)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Acenaphthylene ($\mu\text{g}/\text{l}$)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Anthracene ($\mu\text{g}/\text{l}$)	ND	ND								
Benzo[a]anthracene ($\mu\text{g}/\text{l}$)	ND	ND								
Benzo[a]pyrene ($\mu\text{g}/\text{l}$)	ND	ND								
Benzo[b]fluoranthene ($\mu\text{g}/\text{l}$)	ND	ND								
Benzo[g,h,i]perylene ($\mu\text{g}/\text{l}$)	ND	ND								
Benzo[k]fluoranthene ($\mu\text{g}/\text{l}$)	ND	ND								
Chrysene ND ($\mu\text{g}/\text{l}$)	ND	ND								
Dibenz[a,h]anthracene ($\mu\text{g}/\text{l}$)	ND	ND								
Fluoranthene ($\mu\text{g}/\text{l}$)	ND	ND								
Fluorene ($\mu\text{g}/\text{l}$)	ND	ND								
Indeno[1,2,3-cd]pyrene ($\mu\text{g}/\text{l}$)	ND	ND								
Naphthalene ($\mu\text{g}/\text{l}$)	ND	ND								
Phenanthrene ($\mu\text{g}/\text{l}$)	ND	ND								
Pyrene ($\mu\text{g}/\text{l}$)	ND	ND								

Notes: Results are for monitoring wells sampled within the Paradise City limits in 2019, and again in 2021. All five wells were in burned areas. NA = Not analyzed. Several wells could not be analyzed for all water quality parameters due to limited well volume and slow well recharge rates. ND = No detection (parameter analyzed but the concentration was below the laboratory reporting limit).

Table 2 (continued) Analytical Results for Paradise Monitoring Wells

Well Number and Location Well Depth (feet) Sampling Events	22N03E15P001M 19.5		22N03E24H001M 24		22N03E26A001M 16		22N03E15A001M 13.5		22N04E07L001M 18.5	
	Mar. 2019	Mar. 2021	Mar. 2019	Mar. 2021	Mar. 2019	Mar. 2021	Mar. 2019	Mar. 2021	Mar. 2019	Mar. 2021
	Trace elements and metals									
Copper (D) µg/L	0.586	NA	0.246	NA	0.306	NA	0.234	NA	1.14	NA
Copper (T) µg/L	3.7	NA	1.02	NA	0.47	NA	0.534	NA	5.44	NA
Aluminum (D) µg/L	5.31	NA	2.64	NA	0.296	NA	8.18	NA	13.1	NA
Aluminum (T) µg/L	918	NA	261	NA	55.8	NA	108	NA	1225	NA
Cadmium (D) µg/L	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA
Cadmium (T) µg/L	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA
Chromium (D) µg/L	2.14	NA	2.24	NA	0.6	NA	0.7	NA	0.7	NA
Chromium (T) µg/L	3.02	NA	3.11	NA	0.618	NA	0.733	NA	8.48	NA
Arsenic (D) µg/L	ND	NA	ND	NA	ND	NA	ND	NA	0.171	NA
Arsenic (T) µg/L	0.187	NA	ND	NA	ND	NA	ND	NA	0.316	NA
Antimony (D) µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony (T) µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium (D) µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium (T) µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium (D) µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium (T) µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (D) µg/L	3.01	NA	6	NA	5.23	NA	2.21	NA	3.34	NA
Iron (T) µg/L	576	NA	248	NA	NA	NA	75	NA	1336	NA
Lead (D) µg/L	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA
Lead (T) µg/L	0.32	NA	0.28	NA	NA	NA	0.16	NA	0.18	NA
Manganese (D) µg/L	8.64	NA	11.2	NA	14.7	NA	2.74	NA	3.52	NA
Manganese (T) µg/L	40.2	NA	14.2	NA	NA	NA	13.3	NA	38.5	NA
Nickel (D) µg/L	0.68	NA	1.18	NA	0.35	NA	0.287	NA	1.5	NA
Nickel (T) µg/L	1.33	NA	1.47	NA	NA	NA	0.473	NA	6.83	NA
Selenium (D) µg/L	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA
Silver (D) µg/L	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA
Zinc (D) µg/L	5.32	NA	4.77	NA	1.25	NA	17.8	NA	2.84	NA
Zinc (T) µg/L	7.72	NA	6.72	NA	NA	NA	19.5	NA	7.76	NA
Mercury (mg/l)	0.00037	ND	ND	ND	ND	ND	ND	ND	ND	ND
Petroleum hydrocarbons										
GRO (C4-C12) (µg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C13-C22 (mg/l)	ND	ND	ND	NA	0.16	ND	ND	ND	ND	ND
C10-C28 (mg/l)	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND
Polychlorinated biphenyls										
Aroclor 1016 (µg/l)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Aroclor 1221 (µg/l)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Aroclor 1232 (µg/l)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Aroclor 1242 (µg/l)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Aroclor 1248 (µg/l)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Aroclor 1254 (µg/l)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Aroclor 1260 (µg/l)	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
Aroclor 1262 (µg/l)	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND
Aroclor 1268 (µg/l)	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND

Notes: Results are for monitoring wells sampled within the Paradise City limits in 2019, and again in 2021. All five wells were in burned areas. NA = Not analyzed. Several wells could not be analyzed for all water quality parameters due to limited well volume and slow well recharge rates. ND = No detection (parameter analyzed but the concentration was below the laboratory reporting limit).

Table 3 Analytical Results for Butte Creek Canyon Domestic Wells

Well Number and Location Well Depth (feet) Sampling Events	22N02E25G001M 53		22N02E25H001M 60		22N02E35K001M 110		22N02E35K002M 70	
	Mar. 2019	Dec. 2021	Mar. 2019	Dec. 2021	Mar. 2019	Dec. 2021	Mar. 2019	Dec. 2021
General Water Chemistry								
Solids (T) mg/L	244	208	170	177	180	206	NA	177
Suspended Solids (T) mg/L	24	NA	ND	NA	ND	NA	NA	NA
Alkalinity (T) mg/L as CaCO ₃	176	142	129	125	143	148	NA	122
Hardness (D) mg/L as CaCO ₃	187	152	110	115	143	160	NA	114
Calcium (D) mg/L	34.9	28.3	20	20.8	27.9	31.4	NA	21.4
Magnesium (D) mg/L	24.2	19.7	14.7	15.2	17.8	19.7	NA	14.6
Sodium (D) mg/L	10.7	9.86	7.95	7.77	7.18	7.66	NA	9.77
Potassium (D) mg/L	1.93	1.67	2.03	1.84	1.89	2.14	NA	1.58
Sulfate (D) mg/L	18.3	15.27	5.22	4.24	5.38	11.13	NA	3.19
Chloride (D) mg/L	16.6	11.87	3.81	2.98	9.04	18.39	NA	2.98
Boron (D) mg/L	ND	ND	ND	ND	ND	ND	NA	ND
Specific Conductance μ S/cm@25°C	408	337	260	253	317	331	NA	256
pH pH Units	7.9	7.7	7.9	7.7	7.9	7.7	NA	7.7
Nutrients								
Ammonia (D) mg/L as N	0.206	0.118	ND	ND	ND	ND	NA	ND
Ammonia (as N) (mg/l)	0.14	0.016	ND	ND	ND	ND	NA	ND
Total Kjeldahl Nitrogen (mg/l)	0.11	0.41	ND	0.22	ND	ND	NA	0.21
Nitrogen, Organic (mg/L)	NA	0.39	NA	ND	NA	ND	NA	ND
Nitrate (D) mg/L	ND	NA	ND	NA	8.22	NA	NA	NA
Nitrate Nitrite as N (mg/l)	NA	0.042	NA	0.04	NA	1.8	NA	1.2
Nitrate + Nitrite (D) mg/L as N	ND	ND	ND	ND	1.82	1.79	NA	1.23
Ortho-phosphate (D) mg/L as P	ND	ND	0.05	ND	0.06	0.062	NA	0.097
Phosphorus (T) mg/L as P	0.316	ND	0.05	0.067	0.06	0.035	NA	0.051
Organic Carbon (D) mg/L as C	0.9	NA	0.5	NA	0.5	NA	NA	NA
Organic Carbon (T) mg/L as C	0.9	NA	0.6	NA	0.6	NA	NA	NA
Volatile Organic Compounds and PAHs								
Benzene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Acenaphthene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Acenaphthylene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Anthracene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Benzo[a]anthracene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Benzo[a]pyrene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Benzo[b]fluoranthene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Benzo[g,h,i]perylene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Benzo[k]fluoranthene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Chrysene ND (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Dibenz(a,h)anthracene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Fluoranthene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Fluorene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Indeno[1,2,3-cd]pyrene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Naphthalene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Phenanthrene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND
Pyrene (μ g/l)	ND	ND	ND	ND	ND	ND	NA	ND

Notes: Results are for domestic wells sampled at residences in Butte Creek Canyon in 2019 and again in 2020. Three of the four wells were on properties minimally damaged by fire. Well 22N02E35K002 was damaged by fire and could not be sampled in 2019, but it was repaired prior to the 2020 sampling effort. NA = Not analyzed. ND = No detection (parameter analyzed but the concentration was below the laboratory reporting limit).

Table 3 (continued) Analytical Results for Butte Creek Canyon Domestic Wells

Well Number and Location Well Depth (feet) Sampling Events	22N02E25G001M		22N02E25H001M		22N02E35K001M		22N02E35K002M	
	53		60		110		70	
	Mar. 2019	Dec. 2021						
Trace elements and metals								
Copper (D) µg/L	1.26	1.85	0.154	ND	1.72	4.53	NA	5.178
Copper (T) µg/L	9.42	10.1	0.264	4.63	1.76	5.43	NA	7.63
Aluminum (D) µg/L	0.22	ND	0.263	ND	0.644	ND	NA	ND
Aluminum (T) µg/L	0.749	ND	1.79	ND	1.46	ND	NA	ND
Cadmium (D) µg/L	ND	ND	ND	ND	ND	ND	NA	ND
Cadmium (T) µg/L	ND	ND	ND	ND	ND	ND	NA	ND
Chromium (D) µg/L	1.39	ND	0.6	ND	2.1	1.65	NA	4.804
Chromium (T) µg/L	NA	ND	NA	ND	NA	1.72	NA	5.23
Arsenic (D) µg/L	10.8	15.1	2.819	4.1	0.451	ND	NA	2.12
Arsenic (T) µg/L	33.3	24.8	3.279	4.68	0.47	ND	NA	2.19
Antimony (D) µg/L	NA	ND	NA	ND	NA	ND	NA	ND
Antimony (T) µg/L	NA	ND	NA	ND	NA	ND	NA	ND
Barium (D) µg/L	NA	64.5	NA	36.2	NA	42	NA	40.38
Barium (T) µg/L	NA	76.7	NA	37.7	NA	43.4	NA	40.8
Beryllium (D) µg/L	NA	ND	NA	ND	NA	ND	NA	ND
Beryllium (T) µg/L	NA	ND	NA	ND	NA	ND	NA	ND
Iron (D) µg/L	1.82	242	49.39	308	0.629	26.6	NA	32.19
Iron (T) µg/L	5320	2100	259	576	3.58	7.52	NA	56.5
Lead (D) µg/L	ND	ND	ND	ND	0.085	ND	NA	ND
Lead (T) µg/L	0.38	ND	ND	ND	0.098	ND	NA	ND
Manganese (D) µg/L	1420	861	230	262	0.2	ND	NA	ND
Manganese (T) µg/L	1442	913	232	267	0.202	ND	NA	ND
Nickel (D) µg/L	0.782	ND	0.263	ND	0.534	ND	NA	ND
Nickel (T) µg/L	1.32	1.02	0.506	ND	0.976	ND	NA	ND
Selenium (D) µg/L	0.9	NA	0.355	NA	0.56	NA	NA	NA
Silver (D) µg/L	ND	NA	ND	NA	ND	NA	NA	NA
Zinc (D) µg/L	0.225	ND	2.24	14.3	3.42	5.4	NA	165.6
Zinc (T) µg/L	0.407	ND	2.79	17	3.51	5.39	NA	142.5
Mercury (mg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Petroleum hydrocarbons								
GRO (C4-C12) (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
C13-C22 (mg/l)	ND	NA	ND	NA	ND	NA	NA	NA
C10-C28 (mg/l)	NA	ND	NA	ND	NA	ND	NA	ND
Polychlorinated biphenyls								
Aroclor 1016 (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Aroclor 1221 (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Aroclor 1232 (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Aroclor 1242 (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Aroclor 1248 (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Aroclor 1254 (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Aroclor 1260 (µg/l)	ND	ND	ND	ND	ND	ND	NA	ND
Aroclor 1262 (µg/l)	NA	ND	NA	ND	NA	ND	NA	ND
Aroclor 1268 (µg/l)	NA	ND	NA	ND	NA	ND	NA	ND

Notes: Results are for domestic wells sampled at residences in Butte Creek Canyon in 2019 and again in 2020. Three of the four wells were on properties minimally damaged by fire. Well 22N02E35K002 was damaged by fire and could not be sampled in 2019, but it was repaired prior to the 2020 sampling effort. NA = Not analyzed. ND = No detection (parameter analyzed but the concentration was below the laboratory reporting limit).

Table 4 Analytical Results for Durham Municipal Supply Wells

Well Number and Location Well Depth (feet) Sampling Events	21N01E25A001 275		21N02E30M001 376		21N02E31M001 398	
	Jun. 2019	Dec. 2020	Jun. 2019	Dec. 2020	Jun. 2019	Dec. 2020
General Water Chemistry						
Solids (T) mg/L	245	213	190	178	202	212
Suspended Solids (T) mg/L	ND	NA	ND	NA	ND	NA
Alkalinity (T) mg/L as CaCO3	144	138	120	113	128	148
Hardness (D) mg/L as CaCO3	170	170	128	117	144	171
Calcium (D) mg/L	30.2	60.9	22.9	20.8	25.8	31.2
Magnesium (D) mg/L	23	45.3	17.5	15.7	19.2	22.5
Sodium (D) mg/L	9.58	19.15	8.32	7.97	8.36	8.55
Potassium (D) mg/L	1.19	2.73	1.21	1.59	0.757	1.11
Sulfate (D) mg/L	18.7	17.09	11.4	9.39	10.2	11.91
Chloride (D) mg/L	5	4.56	2.5	2.48	3.62	4.54
Boron (D) mg/L	ND	ND	ND	ND	ND	ND
Specific Conductance μ S/cm@25°C	363	358	276	259	294	357
pH pH Units	7.8	7.8	7.9	7.8	7.9	7.8
Nutrients						
Ammonia (D) mg/L as N	ND	ND	ND	ND	ND	ND
Ammonia (as N) (mg/l)	ND	ND	ND	ND	ND	ND
Total Kjeldahl Nitrogen (mg/l)	ND	0.2	ND	0.15	ND	0.23
Nitrogen, Organic (mg/L)	NA	ND	NA	ND	NA	ND
Nitrate (D) mg/L	24.8	NA	12.4	NA	14.2	NA
Nitrate Nitrite as N (mg/l)	NA	5.4	NA	2.2	NA	4.7
Nitrate + Nitrite (D) mg/L as N	6.1	5.75	3.1	2.37	3.67	4.93
Ortho-phosphate (D) mg/L as P	NA	0.077	NA	0.095	NA	0.087
Phosphorus (T) mg/L as P	0.061	0.042	0.054	0.05	0.065	0.051
Organic Carbon (D) mg/L as C	0.6	NA	ND	NA	0.7	NA
Organic Carbon (T) mg/L as C	0.7	NA	ND	NA	0.7	NA
Volatile Organic Compounds and PAHs						
Benzene (μ g/l)	ND	ND	ND	ND	ND	ND
Acenaphthene (μ g/l)	ND	ND	ND	ND	ND	ND
Acenaphthylene (μ g/l)	ND	ND	ND	ND	ND	ND
Anthracene (μ g/l)	ND	ND	ND	ND	ND	ND
Benzo[a]anthracene (μ g/l)	ND	ND	ND	ND	ND	ND
Benzo[a]pyrene (μ g/l)	ND	ND	ND	ND	ND	ND
Benzo[b]fluoranthene (μ g/l)	ND	ND	ND	ND	ND	ND
Benzo[g,h,i]perylene (μ g/l)	ND	ND	ND	ND	ND	ND
Benzo[k]fluoranthene (μ g/l)	ND	ND	ND	ND	ND	ND
Chrysene ND (μ g/l)	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene (μ g/l)	ND	ND	ND	ND	ND	ND
Fluoranthene (μ g/l)	ND	ND	ND	ND	ND	ND
Fluorene (μ g/l)	ND	ND	ND	ND	ND	ND
Indeno[1,2,3-cd]pyrene (μ g/l)	ND	ND	ND	ND	ND	ND
Naphthalene (μ g/l)	ND	ND	ND	ND	ND	ND
Phenanthrene (μ g/l)	ND	ND	ND	ND	ND	ND
Pyrene (μ g/l)	ND	ND	ND	ND	ND	ND

Notes: Results are for three municipal supply wells sampled in Durham in 2019 and 2020. Wells are downgradient of the Camp Fire burn area, but none were directly damaged by wildfire. NA = Not analyzed. ND = No detection (parameter analyzed but the concentration was below the laboratory reporting limit).

Table 4 (continued) Analytical Results for Durham Municipal Supply Wells

Well Number and Location Well Depth (feet) Sampling Events	21N01E25A001 275		21N02E30M001 376		21N02E31M001 398	
	Jun. 2019	Dec. 2020	Jun. 2019	Dec. 2020	Jun. 2019	Dec. 2020
Trace elements and metals						
Copper (D) µg/L	1.51	4.11	0.839	NA	0.418	NA
Copper (T) µg/L	1.82	23.7	0.911	1.78	0.491	1.74
Aluminum (D) µg/L	0.912	ND	0.928	ND	0.744	ND
Aluminum (T) µg/L	1.17	ND	1.16	ND	1.03	ND
Cadmium (D) µg/L	ND	ND	ND	ND	ND	ND
Cadmium (T) µg/L	ND	ND	ND	ND	ND	ND
Chromium (D) µg/L	5.44	5.11	4.32	3.67	5.16	5.76
Chromium (T) µg/L	5.54	5.49	4.43	3.9	5.29	6.2
Arsenic (D) µg/L	0.561	ND	0.566	ND	0.633	ND
Arsenic (T) µg/L	0.569	ND	0.587	ND	0.656	ND
Antimony (D) µg/L	NA	ND	NA	ND	NA	ND
Antimony (T) µg/L	NA	ND	NA	ND	NA	ND
Barium (D) µg/L	NA	21.3	NA	16.6	NA	15.2
Barium (T) µg/L	NA	21.9	NA	17.4	NA	16.1
Beryllium (D) µg/L	NA	ND	NA	ND	NA	ND
Beryllium (T) µg/L	NA	ND	NA	ND	NA	ND
Iron (D) µg/L	3.56	7.78	0.82	5.18	1.71	5.23
Iron (T) µg/L	6	112	4.36	16.9	5.84	33
Lead (D) µg/L	0.093	ND	ND	ND	ND	ND
Lead (T) µg/L	0.116	1.82	ND	ND	ND	ND
Manganese (D) µg/L	ND	ND	0.156	ND	0.08	ND
Manganese (T) µg/L	ND	ND	0.167	ND	0.105	ND
Nickel (D) µg/L	0.128	1.32	0.152	ND	0.103	ND
Nickel (T) µg/L	0.131	2.23	0.22	2.49	0.181	ND
Selenium (D) µg/L	0.435	NA	0.236	NA	0.435	NA
Silver (D) µg/L	ND	NA	ND	NA	ND	NA
Zinc (D) µg/L	2.87	5.74	0.936	ND	0.532	ND
Zinc (T) µg/L	3.03	13.4	0.982	ND	0.551	ND
Mercury (mg/l)	ND	ND	ND	ND	ND	ND
Petroleum hydrocarbons						
GRO (C4-C12) (µg/l)	ND	ND	ND	ND	ND	ND
C13-C22 (mg/l)	ND	NA	ND	NA	ND	NA
C10-C28 (mg/l)	NA	ND	NA	ND	NA	ND
Polychlorinated biphenyls						
Aroclor 1016 (µg/l)	ND	ND	ND	ND	ND	ND
Aroclor 1221 (µg/l)	ND	ND	ND	ND	ND	ND
Aroclor 1232 (µg/l)	ND	ND	ND	ND	ND	ND
Aroclor 1242 (µg/l)	ND	ND	ND	ND	ND	ND
Aroclor 1248 (µg/l)	ND	ND	ND	ND	ND	ND
Aroclor 1254 (µg/l)	ND	ND	ND	ND	ND	ND
Aroclor 1260 (µg/l)	ND	ND	ND	ND	ND	ND
Aroclor 1262 (µg/l)	NA	ND	NA	ND	NA	ND
Aroclor 1268 (µg/l)	NA	ND	NA	ND	NA	ND

Notes: Results are for three municipal supply wells sampled in Durham in 2019 and 2020. Wells are downgradient of the Camp Fire burn area, but none were directly damaged by wildfire. NA = Not analyzed. ND = No detection (parameter analyzed but the concentration was below the laboratory reporting limit).

Conclusion

The potential exists for fire-related contaminants to enter groundwater resources, resulting in detrimental effects that can be long term and irreversible, or require costly remediation technology (Mansilha et al. 2014; Sunitha et al. 2012; Scherer et al. 2000). This study found very little evidence of fire-related groundwater contamination in and around the City of Paradise in the two years following an urban wildfire event. Although these results may offer some comfort to concerned residents in the area, it is possible that human health hazards remain to be discovered. For example, it may require substantially more time for contaminants to percolate through soil layers and into aquifers. Or, contaminants may have rapidly flushed through the local hydrological system or washed away as runoff, presenting a pollution potential for downgradient aquifers and higher order surface waterbodies.

Groundwater quality impacts are an underemphasized but potentially detrimental consequence of the catastrophic urban wildfires now familiar to many Californians. With this study, the authors hope to encourage an awareness of groundwater resources protection during post-fire remediation efforts. One proposed mitigation measure for protecting groundwater resources after wildfire is to seal openings in damaged wells to prevent contaminated surface water from flowing directly into productive groundwater zones. In addition, groundwater quality monitoring should occur immediately after the fire event and for several seasons. Analytical results of post fire groundwater quality monitoring could result in temporary shifts in water sources, boil water public notices, or prompt additional treatment measures for removing suspected contaminants. Although there are many human and environmental health considerations that must be prioritized after wildfire, groundwater quality protection should be a routine component of coordinated post-fire clean-up efforts.

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