

Groundwater is a vital resource, together let's protect it.

midcountygroundwater.org • 5180 Soquel Drive • Soquel, CA 95073

SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY Board of Directors Remote-Access Meeting Thursday, December 15, 2022, at 6:00 p.m.

Meeting held remotely in compliance with Assemble Bill 361

To join by video: https://us06web.zoom.us/j/84133091220?pwd=Wk00b1Mrb0ZJZU11ZUVHbFJuWk1Zdz09

To join by phone: 253-215-8782 Meeting ID: 841 3309 1220 Passcode: 740731 Find your local number: <u>https://us06web.zoom.us/u/kbcDKCjazd</u>

AGENDA

- 1. Call to Order
- 2. Roll Call
- 3. Oral Communications Related to Items Not on the Agenda

Issues within the purview of the Santa Cruz Mid-County Groundwater Agency (MGA). Guidelines attached.

4. Consent Agenda (Page 4)

- 4.1 Approve September 15, 2022 Meeting Minutes
- 4.2 Accept Audited 2021/2022 Financial Statements
- 4.3 Approve 2023 MGA Board Meeting Schedule
- 4.4 Approve Policy for Reviewing Well Permits under Executive Order N-7-22
- 5. General Business (Page 39)
 - 5.1 <u>Approve Amendment #2 to the Fund Agreement between MGA and County</u> of Santa Cruz
 - 5.2 <u>Approve Consultant Selection for Basin Stream Monitoring and Related</u> <u>Services and Authorize Execution of Contract</u>
 - 5.3 <u>Receive Groundwater Extraction Metering Plan for Non-De Minimis Users</u>

6. Informational Updates (Page 96)

- 6.1 <u>Treasurers Report</u>
- 6.2 <u>Staff Reports</u>
- 6.3 Annual Status Report on Board FPPC Compliance
- 7. Future Agenda Items
- 8. Written Communications and Submitted Materials

Next Board Meeting: If approved by the Board, March 16, 2023

GUIDANCE FOR ORAL AND WRITTEN COMMUNICATIONS AND DISABILITY ACCESS

ORAL COMMUNICATIONS

MGA Board meeting agendas set aside time for oral communications regarding items not on the agenda but within the purview of the MGA. Oral communications are also heard during the consideration of an agenda item.

Anyone wishing to provide public comment should come to the front of the room to be recognized by the Board Chair. Individual comments are limited to three (3) minutes; a maximum time of 15 minutes is set aside each time for oral communications. The time limits may be increased or decreased at the Board Chair's discretion. Speakers must address the entire Board; dialogue is not permitted between speakers and other members of the public or Board members, or among Board members.

While the Board may not take any action based upon oral communications, an issue raised during oral communications may be placed on the agenda for a future Board meeting.

Organized groups wishing to make an oral presentation to the Board may contact Laura Partch at 831-662-2053 or <u>admin@midcountygroundwater.org</u>, preferably at least two weeks prior to the meeting.

WRITTEN COMMUNICATIONS

Written communications to the Santa Cruz Mid-County Groundwater Agency (MGA) Board may be submitted as follows:

- Via email: comment@midcountygroundwater.org
- Via mail or hand delivery: MGA Board of Directors, c/o Emma Olin, 5180 Soquel Drive, Soquel, CA 95073

Deadlines for Submittal:

- Written communications received <u>by</u> 4:00 p.m. on the Tuesday of the week prior to a regularly scheduled (Thursday) Board meeting will be distributed to the Board and made available on the MGA's <u>website</u> at the time the Agenda is posted.
- Written communications received <u>after</u> the 4:00 p.m. deadline will be posted on the MGA <u>website</u> and Board members informed of the communications at the earliest opportunity. Please note, communications received after 9:00 a.m. the day before the Board Meeting may not have time to reach Board members, nor be read by them prior to consideration of an item.
- Written communications received at a Board meeting will be distributed to Board members and posted on the MGA <u>website</u> at the earliest opportunity.

Any written communication submitted to the Board will be made available on the MGA website at <u>http://www.midcountygroundwater.org/committee-meetings</u> and constitutes a public record. Please do not include any private information in your communication that you do not want made available to the public.

DISABILITY ACCESS: Please contact Laura Partch at <u>admin@midcountygroundwater.org</u> or 831-662-2053 for information or to request an accommodation.



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SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY

Board of Directors Remote-Access Meeting Thursday, September 15, 2022

DRAFT MINUTES

1. Call to Order

The meeting was called to order at 6:00 by Chair LaHue.

2. Roll Call

Directors present: Curt Abramson, Zach Friend, Bruce Jaffe, Jim Kerr, Tom LaHue, and Marco Romanini; Alternative Directors Doug Engfer and Robert Schultz.

Directors absent: David Baskin, Jon Kennedy, Manu Koenig, Rob Marani, and Donna Meyers.

Staff present: Ralph Bracamonte, Ron Duncan, Rosemary Menard, Sierra Ryan.

Consultants present: Tim Carson and Laura Partch (RWMF), Gordon Thrup (Geosyntec)

Others: Sarah Perez (City of Santa Cruz), and several members of the public.

3. Oral Communications Related to Items Not on the Agenda Issues within the purview of the Santa Cruz Mid-County Groundwater Agency (MGA). Guidelines attached.

None.

4. Consent Agenda

- 4.1 Approve Minutes of August 18, 2022 Special Board Meeting
- 4.2 Biennial Review of Conflict of Interest Code
- 4.3 Approve Memorandum of Understanding with Santa Cruz Public Libraries
- 4.4 Consider Board Resolution No. 22-04 to Authorize Remote Meeting

MOTION: Director Friend; Second, Director Engfer. To approve the consent agenda as amended with modifications outlined by Mr. Carson on minor, non-substantive language changes to Item 4.3. Motion passed unanimously by roll call vote; Director Jaffe and Alternate Director Schultz abstained on Item 4.1.

5. General Business

5.1 Conduct Annual Election of Officers

Pursuant to the First Amended Bylaws, officer elections now take place at the first meeting of each calendar year and will be held in March 2023.

5.2 Approve Local Project Sponsor Agreements under Sustainable Groundwater Management Implementation Grant

The MGA is the grantee for the \$7.6 million dollar Sustainable Groundwater Management Implementation grant (SGMI Grant). The three Local Sponsor Agreements, which follow the structure of the SGMI Grant and include the grant terms and conditions, are with the MGA Member Agencies implementing components or projects under the grant. Each agreement requires final approval from the Member Agencies, so while no substantive changes are anticipated, the possibility exists for mutually agreeable changes as the documents are finalized. In response to a Board question, Mr. Carson stated if the Department of Water Resources (DWR) determined that certain costs were ineligible or otherwise inconsistent with the grant agreement, the Local Project Sponsor, rather than the MGA, would be responsible for those costs.

MOTION: Director Romanini; Second, Director Jaffe. To approve the Local Project Sponsor Agreement with the Soquel Creek Water District. Motion passed unanimously by roll call vote.

MOTION: Director Romanini; Second, Director Jaffe. To approve the Local Project Sponsor Agreement with the City of Santa Cruz. Motion passed unanimously by roll call vote.

MOTION: Director Romanini; Second, Director Jaffe. To approve the Local Project Sponsor Agreement with the County of Santa Cruz. Motion passed unanimously by roll call vote.

5.3 Provide Guidance and Authorize Policy Framework to Respond to Well Permit Applications Under Executive Order N-7-22

Staff sought final direction from the Board on the policy framework because although the policy will come back to the Board in December on the consent agenda, it will go into effect immediately. Legislation intended to make this permanent failed to advance, so this is deemed a temporary measure while Executive Order N-7-22 is in effect. The language regarding replacement wells has been removed and will be left to the discretion of the RWMF Senior Planner in reviewing the well application.

In response to Board questions, staff clarified that if the Executive Team does not reach a unanimous decision regarding a well permit application the issue would go to the Board and be decided by a majority vote, that the final policy will clarify throughout that it applies only to non-*de minimis* wells, and that an applicant hearing before the Board will serve as the functional equivalent of an appeal. Staff determined the 10-acre feet criteria provided a good representation of large water users and is used by Pajaro Valley Water Management Agency to require metering. All wells under this policy will require metering.

MOTION: Director Friend; Second, Director Kerr. To approve Policy Framework and authorize staff to finalize a policy, effective immediately, to respond to MGA responsibilities under Executive Order N-7-22. Motion passed unanimously by roll call vote.

5.4 Provide Guidance on Draft Metering Plan

The Basin GSP calls for certain non-*de minimis* wells to be metered and requires a Metering Plan. Staff and consultant Geosyntec have been working on the Metering Plan, but issues regarding the confidentiality of water usage and the use of the term "ordinance" need to be reviewed by legal counsel. Funds are allocated in the SGMI Grant for implementing the Metering Plan. It is anticipated that the Metering Plan will include approximately 60 parcels, but whether the plan will apply to parcels or wells needs to be resolved. State law designates enforcement to Groundwater Sustainability Agencies, but this will be a new role for the MGA in setting penalties and enforcing violations of its code. The MGA will also be creating a system for well identification. The policy will come back to the Board for final adoption at the December Board meeting.

5.5 Demonstration of the Data Management System (no memo)

The Data Management System (DMS) is a countywide system with a public-facing portal that represents years of work by member agency staff of both the MGA and Santa Margarita Groundwater Agencies, consultant KISTERS with its water information system WISKI, and Montgomery & Associates. An introduction to the DMS, the demonstration, and responses to Board questions can be viewed at minutes 42:20 to 55:20 of the meeting recording.

6. Informational Updates

6.1 Treasurer's Report

No comments.

6.2 Staff Reports

The MGA will be releasing a Request for Proposals for a multi-year monitoring contract to oversee recently installed stream gages, finalize rating curves, ongoing data collection, calibrations, work with WISKI, and contributing a discussion of the data for the annual report. Staff will bring a selected contractor to the Board in December.

A summary report from Trout Unlimited was provided in the packet.

There has been ongoing coordination with DWR regarding airborne electromagnetic surveys planned for this fall.

For the monitoring network, six stream gages have been installed, and seven monitoring wells should be installed by the end of October.

7. Future Agenda Items

None.

8. Written Communications and Submitted Materials

Information received related to fog harvesting and posted on website.

8. Adjournment

Chair LaHue adjourned the meeting at 7:02 p.m.

Next Board Meeting: December 15, 2022

December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 4.2

Title: Accept Audited 2021/2022 Financial Statements

Attachments:

- 1. Santa Cruz Mid-County Groundwater Agency Annual Financial Report for the Year Ended June 30, 2022
- 2. Santa Cruz Mid-County Groundwater Agency Management Report, June 30, 2022

Recommended Board Action: Accept the audited Financial Report for the period ending June 30, 2022

Attached for the Board's review is the Agency's Annual Financial Report for fiscal year 2021/22, as well as the Management Report prepared by our audit firm Davis Farr, LLP. The financial report is prepared in accordance with Government Accounting Standards. The Agency received an unqualified opinion, meaning the financial statements present fairly, in all material respects, the financial position of the Santa Cruz Mid-County Groundwater Agency as of June 30, 2022, and the results of its operations and its cash flows are in conformity with generally accepted accounting principles.

Special thanks to Ryan Kinney, Soquel Creek Water District Supervising Accountant, for his help in preparing the Annual Financial Report.

Recommended Board Action:

1. BY MOTION and roll call vote, accept the audited Financial Report for the period ending June 30, 2022.

Submitted by: Leslie Strohm Treasurer Santa Cruz Mid-County Groundwater Agency

Agenda Item 4.2.1



SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY

Annual Financial Report

For the Year Ended June 30, 2022



Board of Directors as of June 30, 2022

Name	Title	Member Agency	Current Term
Tom LaHue	Chairman	Soquel Creek Water District	01/22 - 01/23
David Baskin	Vice Chairman	City of Santa Cruz	01/22 - 01/23
Jim Kerr	Secretary	Private Well Representative	01/22 - 01/24
Jon Kennedy	Director	Private Well Representative	01/22 - 01/26
Curt Abramson	Director	Private Well Representative	01/22 - 01/26
Marco Romanini	Director	Central Water District	12/18 - 10/22
Zack Friend	Director	County of Santa Cruz	01/22 - 01/23
Bruce Jaffe	Director	Soquel Creek Water District	01/22 - 01/23
Donna Meyers	Director	City of Santa Cruz	01/22 - 01/23
Manu Koenig	Director	County of Santa Cruz	01/22 – 01/23
Robert Marani	Director	Central Water District	03/20 - 03/24

Santa Cruz Mid-County Groundwater Agency Leslie Strohm, Treasurer 5180 Soquel Drive Soquel, California 95073 (831) 475-8500 www.midcountygroundwater.org

Annual Financial Report

For the Year Ended June 30, 2022

Annual Financial Report

For the Fiscal Year Ended June 30, 2022

Table of Contents

	<u>Page</u> No.
Financial Section	
Independent Auditor's Report	1
Management's Discussion and Analysis	4
Basic Financial Statements: Statements of Net Position Statements of Revenues, Expenses, and Changes in Net Position Statements of Cash Flows	7 8 9
Notes to the Basic Financial Statements	10
Report on Internal Controls and Compliance	
Report on Internal Controls Over Financial Reporting Based on Audits of Financial Statements Performed in Accordance with <i>Government Auditing Standards</i>	13

Financial Section



Independent Auditor's Report

Governing Board Santa Cruz Mid-County Groundwater Agency Santa Cruz, California

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of Santa Cruz Mid-County Groundwater Agency ("Agency"), as of and for the year June 30, 2022, and the related notes to the financial statements, which collectively comprise the Agency's basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements present fairly, in all material respects, the respective financial position of Santa Cruz Mid-County Groundwater Agency, as of June 30, 2022, and the respective changes in financial position and cash flows thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of Santa Cruz Mid-County Groundwater Agency and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis of Matter

The financial statements for the year ended June 30, 2021 reflect certain prior period adjustments as descried further in note 3 to the financial statements. Our opinion is not modified with respect to this matter.

Responsibilities of Management for the Financial Statements

Santa Cruz Mid-County Groundwater Agency management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Agency's ability to continue as a going concern for one year after the date that the financial statements are issued.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of Santa Cruz Mid-County Groundwater Agency's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about Santa Cruz Mid-County Groundwater Agency's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the *Management's Discussion and Analysis* be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information

because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Report on Summarized Comparative Information

We have previously audited Santa Cruz Mid-County Groundwater Agency's 2021 financial statements, and we expressed an unmodified audit opinion on those audited financial statements in our report dated December 9, 2021. In our opinion, the summarized comparative information presented herein as of and for the year ended June 30, 2021, is consistent, in all material respects, with the audited financial statements from which it has been derived.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated December 9, 2022 on our consideration of the Agency's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Agency's internal control over financial reporting and compliance.

avis Far LLP

Irvine, California December 9, 2022

Santa Cruz Mid-County Groundwater Agency Management's Discussion and Analysis For the Year Ended June 30, 2022

As management of the Santa Cruz Mid-County Groundwater Agency (Agency), we offer readers of the Agency's financial statements this narrative overview and analysis of the financial activities and performance of the Agency for the fiscal years ended June 30, 2022 and 2021. Please read it in conjunction with additional information that we have furnished in the accompanying basic financial statements, which follow this section.

Financial Highlights

- The Agency's net position increased 12.85% or \$218,501 to \$1,919,451. In fiscal year 2021, the Agency's net position decreased 13.53% or \$266,096 to \$1,700,950.
- The Agency's total revenues increased 100.00% or \$300,000 to \$300,000. In fiscal year 2021, the Agency's total revenues decreased 100.00% or \$650,415 to \$0.
- The Agency's total expenses increased 38.16% or \$123,101 to \$445,714. In fiscal year 2021, the Agency's total expenses decreased 33.54% or \$162,815 to \$322,613.

Using This Financial Report

This annual report consists of a series of financial statements. The Statements of Net Position and the Statements of Activities provide information about the activities and performance of the Agency using accounting methods similar to those used by private sector companies. The Statements of Net Position includes all of the Agency's investments in resources (assets), deferred outflows of resources, obligations to creditors (liabilities), and deferred inflows of resources. It also provides the basis for computing a rate of return, evaluating the capital structure of the Agency and assessing the liquidity and financial flexibility of the Agency. All of the current year's revenue and expenses are accounted for in the Statements of Activities. These statements measure the success of the Agency's operations and can be used to determine the Agency's profitability and credit worthiness.

Financial Analysis of the Agency

Statement of Net Position and Statement of Activities

One of the most important questions asked about the Agency's finances is, "Is the Agency better off or worse off as a result of this year's activities?" A Statement of Net Position and a Statement of Activities report information about the Agency in a way that helps answer this question.

These statements include all assets and deferred outflows of resources, liabilities, and deferred inflows of resources, using the *accrual basis of accounting*, which is similar to the accounting used by most private sector companies. All of the current year's revenues and expenses are taken into account regardless of when the cash is received or paid.

These two statements report the Agency's *net position* and changes in them. One can think of the Agency's net position – the difference between assets and deferred outflows of resources less liabilities and deferred inflows of resources – as one way to measure the Agency's financial health, or *financial position*. Over time, *increases or decreases* in the Agency's net position are one indicator of whether its *financial health* is improving or deteriorating. However, one will need to consider other non-financial factors, such as changes in the organizational agreements to assess the *overall health* of the Agency in future periods.

Notes to the Basic Financial Statements

The notes provide additional information that is essential to a full understanding of the data provided in the government-wide and fund financial statements. The notes to the basic financial statements can be found on pages 10 through 12.

Statement of Net Position

Condensed Statement of Net Position

	2022	2021	Change
Assets:			
Current Assets	\$ 2,133,257	1,806,646	326,611
Total assets	2,133,257	1,806,646	326,611
Liabilities:			
Current liabilities	213,806	105,696	108,110
Total liabilities	213,806	105,696	108,110
Net position:			
Unrestricted	1,919,451	1,700,950	218,501
Total net position	\$ 1,919,451	1,700,950	218,501

As noted earlier, net position may serve over time as a useful indicator of a government's financial position. In the case of the Agency, assets exceeded liabilities by \$1,919,451 and \$1,700,950 as of June 30, 2022 and 2021, respectively.

Statement of Revenues, Expenses, and Changes in Net Position

Condensed Statement of Revenues, Expenses, and Changes in Net Position

	_	2022	2021	Change
Revenues:				
Operating revenues	\$	300,000	-	300,000
Total operating revenues		300,000	-	300,000
Expenses:				
Operating expenses		445,714	322,613	123,101
Total operating expenses		445,714	322,613	123,101
Non-operating revenues:				
Grant revenue		228,232	56,517	171,715
Total non-operating revenues		228,232	56,517	171,715
Change in net position		82,518	(266,096)	348,614
Net position, beginning of period		1,700,950	1,967,046	(266,096)
Prior period adjustment		135,983		135,983
Net position, end of period	\$	1,919,451	1,700,950	218,501

The statements of revenues, expenses, and changes in net position show how the government's net position changed during the fiscal years. In the case of the Agency, net position increased 12.85% or \$218,501 to \$1,919,451, as a result of ongoing operations. In fiscal year 2021, the Agency's net position decreased 13.53% or \$266,096 to \$1,700,950, as a result of ongoing operations.

Total revenues increased 100.00% or \$300,000 to \$300,000, due primarily to an increase in dues contributed by each member agencies. In fiscal year 2021, total revenues decreased 100.00% or \$650,415 to \$0, due primarily to a decrease in dues contributed by member agencies.

Santa Cruz Mid-County Groundwater Agency Management's Discussion and Analysis For the Year Ended June 30, 2022

For the years ended June 30, 2022 and 2021, the operating revenues of \$300,000 and \$0, respectively, consist of the dues contributed by each member agency. Member agencies are invoiced a percentage of the projected budget for the fiscal year based on the following schedule:

Member Agency	2022	2021
Soquel Creek Water District	70 %	0 %
Central Water District	10	0
City of Santa Cruz	10	0
County of Santa Cruz	10	0
	100 %	0 %

Total expenses increased 38.16% or \$123,101 to \$445,714, due primarily to an increase of \$99,077 in groundwater management and an increase of \$24,024 in general and administrative expense. In fiscal year 2021, total expenses decreased 33.54% or \$162,814 to \$322,613, due primarily to an increase of \$18,698 in groundwater management and a decrease of \$181,512 in general and administrative expense.

Conditions Affecting Current Financial Position

Management is unaware of any conditions which could have a significant impact on the Agency's current financial position, net position, or operating results in terms of past, present, and future.

Requests for Information

The Agency's basic financial statements are designed to present users with a general overview of the Agency's finances and to demonstrate the Agency's accountability. If you have any questions about the report or need additional information, please contact the Agency's Treasurer, Leslie Strohm at Santa Cruz Mid-County Groundwater Agency, 5180 Soquel Drive, Soquel CA 95073 or (831)475-8500.

Basic Financial Statements

SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY Statement of Net Position June 30, 2022

(with prior year data for informational purposes)

	2022	2021
Current assets:		
Cash and cash equivalent (Note 2)	\$ 1,814,953	\$ 1,740,890
Accounts receivable	316,231	64,077
Prepaid expenses	2,073	1,679
Total current assets	2,133,257	1,806,646
Current liabilities:		
Accounts payable	213,806	105,696
Total current liabilities	213,806	105,696
Net position:		
Unrestricted	1,919,451	1,700,950
Total net position	\$ 1,919,451	\$ 1,700,950

21 of 158

SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY Statement of Revenues, Expenses, and Changes in Net Position June 30, 2022

(with prior year data for informational purposes)

	2022	2021
Operating revenues: Membership revenue	\$ 300,000	_
Total operating revenues	300,000	
Operating expenses: Groundwater management General and administrative	253,276 192,438	154,199 168,414
Total operating expenses	445,714	322,613
Total operating income (loss)	(145,714)	(322,613)
Non-operating revenues: Grant revenue	228,232	56,517
Total non-operating revenues	228,232	56,517
Change in net position	82,518	(266,096)
Net position, beginning of period Prior period adjustment (Note 3)	1,700,950 135,983	1,967,046
Net position, end of period	\$ 1,919,451	1,700,950



SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY Statement of Cash Flows June 30, 2022

(with prior year data for informational purposes)

	2022	2021
Cash flows from operating activities: Cash receipts from members Payments to vendors for materials and services	\$ 300,000 (337,998)	\$ - (256,306)
Net cash provided by operating activities	(37,998)	(256,306)
Cash flows from financing activities: Grant revenue	112,061	105,989
Net cash provided by financing activities	112,061	105,989
Net increase in cash and cash equivalents	74,063	(150,317)
Cash and cash equivalents, beginning of year	1,740,890	1,891,207
Cash and cash equivalents, end of year	\$ 1,814,953	\$ 1,740,890
Reconciliation of operating income(loss) to net cash provided by(used) in operating activities:		
Operating income(loss)	\$ (145,714)	\$ (322,613)
Changes in assets and liabilities: (Increase) in assets: Prepaid expenses	(394)	79
Increase(decrease) in liabilities: Accounts payable	108,110	66,228
Net cash provided by operating activities	\$ (37,998)	\$ (256,306)

Noncash Investing, Capital and Financing Activities:

There were no significant noncash investing, capital or financing activities during the years ended June 30, 2022 or 2021.

Notes to the Basic Financial Statements

For the Year Ended June 30, 2022

(1) <u>Summary of Significant Accounting Policies</u>

A. Organization and Operations of the Reporting Entity

On March 17, 2016, the Central Water District, the City of Santa Cruz, the County of Santa Cruz, and the Soquel Creek Water District (Members) entered into a joint powers agreement creating the Santa Cruz Mid-County Groundwater Agency (Agency). Each Member is a local agency, as defined by the Sustainable Groundwater Management Act of 2014 (SGMA), duly organized and existing under and by virtue of the laws of the State of California, and each Member can exercise powers related to groundwater management. The purpose of the agreement is to create a groundwater sustainability agency by June 30, 2017 to manage groundwater basins designated by the California Department of Water Resources as medium and high priority basins. The Agency is a basin consolidation of all or parts of four existing groundwater basins: Soquel Valley, West Santa Cruz Terrace, Santa Cruz Purisima Formation, and Pajaro Valley Groundwater Basins.

Under the Joint Exercise of Powers Act of 2000 (Act), including the Marks-Roos Local Bond Pooling Act of 1985 (Government Code sections 6584, et seq.), the Agency is authorized to issue bonds, and under certain circumstances, to purchase bonds issued by, or to make loans to, the Members for financing public capital improvements, working capital, liability and other insurance needs or projects whenever doing so results in significant public benefits, as determined by the Members. The Act further authorizes and empowers joint powers authorities to sell bonds that are issued or purchased to public or private purchasers at public or negotiated sales.

SGMA requires the adoption of a groundwater sustainability plan (GSP) by January 31, 2020, for all medium and high priority basins identified as being subject to critical conditions of overdraft. The Members will develop the GSP and manage the Basin pursuant to SGMA.

The term of the agreement shall remain in effect until terminated by unanimous written consent of all Members, except during the outstanding term of any Agency indebtedness. Upon termination of the agreement, the assets shall be distributed in proportion to the contributions of each Member agency.

B. Basis of Accounting and Measurement Focus

The Agency is accounted for as an enterprise fund in accordance with generally accepted accounting principles (GAAP) as applied to governmental units. Enterprise funds are used to account for operations that are financed and operated in a manner similar to a private business enterprise, where the expenses, of providing goods and services to the general public are recovered through user charges, or where the governing body has decided that periodic determination of revenue earned, expenses incurred, and net income is appropriate for capital maintenance, public policy, management control, or other purposes. Because the Agency is accounted for as an enterprise fund, the Agency uses the economic resources measurement focus and the accrual basis of accounting for financial statement reporting purposes. Revenues are recognized in the accounting period in which they are earned, and expenses are recognized in the period incurred, regardless of when the related cash flows take place. With the measurement focus, all assets and liabilities associated with the operation of these funds are included in the Statement of Net Position.

C. Financial Reporting

The Agency's basic financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (GAAP). The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles.

Notes to the Basic Financial Statements (Continued)

For the Year Ended June 30, 2022

(1) <u>Summary of Significant Accounting Policies (Continued)</u>

D. Assets, Liabilities, and Net Position

1. Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements and the reported changes in the Agency's net position during the reporting period. Actual results could differ from those estimates.

2. Cash and Cash Equivalents

Substantially, all of the Agency's cash is held in a financial institution bank account. The Agency considers all highly liquid investments with a maturity of three months or less to be cash equivalents.

3. Revenue Recognition

Membership dues are recognized as revenue at the time each member agency is invoiced or when a resolution is approved by the Board during the year.

4. Net Position/Fund Balances

The financial statements utilize a net position presentation. Net position categories are follows:

- **Net investment in capital assets** consists of capital assets, net of accumulated depreciation and reduced by any outstanding debt against the acquisition, construction or improvement of those assets.
- **Restricted net position** consists of constraints placed on net position use through external constraints imposed by creditors, grantors, contributors, or laws or regulations of other governments or constraints imposed by law through constitutional provisions or enabling legislation.
- Unrestricted net position consists of the net position balance that does not meet the definition of *restricted* or *net investment in capital assets* components of net position.

5. Comparative Data

Selected information regarding the prior year has been included in the accompanying financial statements. This information has been included for comparison purposes only and does not represent a complete presentation in accordance with generally accepted accounting principles. Accordingly, such information should be read in conjunction with the government's prior year financial statements, from which this selected financial data was derived.

(2) Cash and Cash Equivalents

Cash and cash equivalents as of June 30, 2022 is classified in the accompanying financial statements as follows:

Cash and cash equivalents \$ 1,814,953

Cash and cash equivalents as of June 30, 2021 consists of the following:

Deposits with financial institutions \$ 1,814,953

Notes to the Basic Financial Statements (Continued)

For the Year Ended June 30, 2022

(2) Cash and Cash Equivalents (Continued)

Custodial Credit Risk

Custodial credit risk for *deposits* is the risk that, in the event of the failure of a depository financial institution, a government will not be able to recover its deposits or will not be able to recover collateral securities that are in the possession of an outside party.

The California Government Code and the Agency's investment policy do not contain legal or policy requirements that would limit the exposure to custodial credit risk for deposits, other than the following provision for deposits: The California Government Code requires that a financial institution secure deposits made by state or local governmental units by pledging securities in an undivided collateral pool held by a depository regulated under state law (unless so waived by the governmental unit). The market value of the pledged securities in the collateral pool must equal at least 110% of the total amount deposited by public agencies. As of June 30, 2022, bank balances are federally insured up to \$250,000. The remaining balance is collateralized in accordance with the Code; however, the collateralized securities are not held in the Agency's name.

(3) <u>Restatement of Net Position</u>

A prior period adjustment was recorded to recognize grant revenues relating to prior periods. The Agency recorded the following prior period adjustment:

Net position as previously reported at June 30, 2021	\$1,700,950
Prior period revenues	135,983
Net position as restated at June 30, 2021	<u>\$1,836,933</u>

(4) Contingencies

Litigation

In the ordinary course of operations, the Agency is subject to claims and litigation from outside parties. After consultation with legal counsel, the Agency believes the ultimate outcome of such matters, if any, will not materially affect its financial condition.

Report on Internal Controls and Compliance



Report on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

Governing Board Santa Cruz Mid-County Groundwater Agency Santa Cruz, California

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the Santa Cruz Mid- County Groundwater Agency (Agency) as of and for the year ended June 30, 2022, and the related notes to the financial statements, which collectively comprises the Agency's basic financial statements, and have issued our report thereon dated December 9, 2022.

Internal Control Over Financial Reporting

In planning and performing our audits of the financial statements, we considered the Agency's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Agency's internal control. Accordingly, we do not express an opinion on the effectiveness of the Agency's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or, significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Agency's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

avis Far LLP

Irvine, California December 9, 2022



Groundwater is a vital resource, together let's protect it.

5180 Soquel Drive $\,\cdot\,$ Soquel, CA 95073 $\,\cdot\,$ (831) 454-3133 $\,\cdot\,$ midcountygroundwater.org

December 9, 2022 Davis Farr LLP 18201 Von Karman Ave, Ste 1100 Irvine, CA 92612

This representation letter is provided in connection with your audit of the financial statements of the Santa Cruz Mid-County Groundwater Agency as of June 30, 2022 and for the year then ended, and the related notes to the financial statements, for the purpose of expressing opinions on whether the basic financial statements present fairly, in all material respects, the financial position, results of operations, and cash flows, where applicable, of the various opinion units of Santa Cruz Mid-County Groundwater Agency in accordance with accounting principles generally accepted for governments in the United States of America (U.S. GAAP).

Certain representations in this letter are described as being limited to matters that are material. Items are considered material, regardless of size, if they involve an omission or misstatement of accounting information such that, in the light of surrounding circumstances, there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

We confirm that, to the best of our knowledge and belief, having made such inquiries as we considered necessary for the purpose of appropriately informing ourselves as of December 9, 2022.

Financial Statements

- We have fulfilled our responsibilities, as set out in the terms of the audit engagement letter dated July 6, 2022 for the preparation and fair presentation of the financial statements of the various opinion units referred to above in accordance with U.S. GAAP.
- We acknowledge our responsibility for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.
- We acknowledge our responsibility for the design, implementation, and maintenance of internal control to prevent and detect fraud.
- We acknowledge our responsibility for compliance with the laws, regulations, and provisions of contracts and grant agreements.
- We have reviewed, approved, and taken responsibility for the financial statements and related notes.
- We have a process to track the status of audit findings and recommendations.
- We have identified and communicated to you all previous audits, attestation engagements, and other studies related to the audit objectives and whether related recommendations have been implemented.
- Significant assumptions used by us in making accounting estimates, including those measured at fair value, are reasonable.

- All related party relationships and transactions have been appropriately accounted for and disclosed in accordance with the requirements of U.S. GAAP.
- All events subsequent to the date of the financial statements and for which U.S. GAAP requires adjustment or disclosure have been adjusted or disclosed.
- The effects of all known actual or possible litigation and claims have been accounted for and disclosed in accordance with U.S. GAAP.
- All component units, as well as joint ventures with an equity interest, are included and other joint ventures and related organizations are properly disclosed.
- All funds and activities are properly classified.
- All funds that meet the quantitative criteria in GASB Statement No. 34, *Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments*, GASB Statement No. 37, *Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments: Omnibus as amended, and GASB Statement No. 65, Items Previously Reported as Assets and Liabilities*, for presentation as major are identified and presented as such and all other funds that are presented as major are considered important to financial statement users.
- All components of net position, nonspendable fund balance, and restricted, committed, assigned, and unassigned fund balance are properly classified and, if applicable, approved.
- Our policy regarding whether to first apply restricted or unrestricted resources when an expense is incurred for purposes for which both restricted and unrestricted net position/fund balance are available is appropriately disclosed and net position/fund balance is properly recognized under the policy.
- All revenues within the statement of activities have been properly classified as program revenues, general revenues, contributions to term or permanent endowments, or contributions to permanent fund principal.
- All expenses have been properly classified in or allocated to functions and programs in the statement of activities, and allocations, if any, have been made on a reasonable basis.
- All interfund and intra-entity transactions and balances have been properly classified and reported.
- Special items and extraordinary items have been properly classified and reported.
- Deposit and investment risks have been properly and fully disclosed.
- Capital assets, including infrastructure assets, are properly capitalized, reported, and if applicable, depreciated.
- All required supplementary information is measured and presented within the prescribed guidelines.
- With regard to investments and other instruments reported at fair value:
 - The underlying assumptions are reasonable and they appropriately reflect management's intent and ability to carry out its stated courses of action.
 - The measurement methods and related assumptions used in determining fair value are appropriate in the circumstances and have been consistently applied.
 - The disclosures related to fair values are complete, adequate, and in accordance with U.S. GAAP.
 - There are no subsequent events that require adjustments to the fair value measurements and disclosures included in the financial statements.
- With respect to proposing journal entries, we have performed the following:
 - Made all management decisions and performed all management functions;
 - Assigned a competent individual to oversee the services;
 - Evaluated the adequacy of the services performed;
 - Evaluated and accepted responsibility for the result of the service performed; and

Established and maintained internal controls, including monitoring ongoing activities.

Information Provided

- We have provided you with:
 - Access to all information, of which we are aware that is relevant to the preparation and fair presentation of the financial statements of the various opinion units referred to above, such as records, documentation, meeting minutes, and other matters;
 - Additional information that you have requested from us for the purpose of the audit;
 - Unrestricted access to persons within the entity from whom you determined it necessary to obtain audit evidence.
 - A written acknowledgement of all the documents that we expect to issue that will be included in the annual report and the planned timing and method of issuance of that annual report;
 - A final version of the annual report (including all the documents that, together, comprise the annual report) in a timely manner prior to the date of the auditor's report.
- The financial statements and any other information included in the annual report are consistent with one another, and the other information does not contain any material misstatements.
- All transactions have been recorded in the accounting records and are reflected in the financial statements.
- We have disclosed to you the results of our assessment of the risk that the financial statements may be materially misstated as a result of fraud.
- We have provided to you our analysis of the entity's ability to continue as a going concern, including significant conditions and events present, and if necessary, our analysis of management's plans, and our ability to achieve those plans.
- We have no knowledge of any fraud or suspected fraud that affects the entity and involves:
 - Management;
 - Employees who have significant roles in internal control; or
 - Others where the fraud could have a material effect on the financial statements.
- We have no knowledge of any fraud, or suspected fraud, affecting the entity's financial statements communicated by employees, former employees, vendors, regulators, or others.
- We are not aware of any pending or threatened litigation, claims, and assessments whose effects should be considered when preparing the financial statements.
- We have disclosed to you the identity of all the entity's related parties and the nature of all the related party relationships and transactions of which we are aware.
- There have been no communications from regulatory agencies concerning noncompliance with or deficiencies in accounting, internal control, or financial reporting practices.
- Santa Cruz Mid-County Groundwater Agency has no plans or intentions that may materially affect the carrying value or classification of assets and liabilities.
- We have disclosed to you all guarantees, whether written or oral, under which Santa Cruz Mid-County Groundwater Agency is contingently liable.
- We have disclosed to you all nonexchange financial guarantees, under which we are obligated and have declared liabilities and disclosed properly in accordance with GASB Statement No. 70, Accounting and Financial Reporting for Nonexchange

Financial Guarantees, for those guarantees where it is more likely than not that the entity will make a payment on any guarantee.

- For nonexchange financial guarantees where we have declared liabilities, the amount of the liability recognized is the discounted present value of the best estimate of the future outflows expected to be incurred as a result of the guarantee. Where there was no best estimate but a range of estimated future outflows has been established, we have recognized the minimum amount within the range.
- We have disclosed to you all significant estimates and material concentrations known to management that are required to be disclosed in accordance with GASB Statement No. 62 (GASB-62), *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements.* Significant estimates are estimates at the balance sheet date that could change materially within the next year. Concentrations refer to volumes of business, revenues, available sources of supply, or markets or geographic areas for which events could occur that would significantly disrupt normal finances within the next year.
- We have identified and disclosed to you the laws, regulations, and provisions of contracts and grant agreements that could have a direct and material effect on financial statement amounts, including legal and contractual provisions for reporting specific activities in separate funds.
- There are no:
 - Violations or possible violations of laws or regulations, or provisions of contracts or grant agreements whose effects should be considered for disclosure in the financial statements or as a basis for recording a loss contingency, including applicable budget laws and regulations.
 - Unasserted claims or assessments that our lawyer has advised are probable of assertion and must be disclosed in accordance with GASB-62.
 - Other liabilities or gain or loss contingencies that are required to be accrued or disclosed by GASB-62.
 - Continuing disclosure consent decree agreements or filings with the Securities and Exchange Commission and we have filed updates on a timely basis in accordance with the agreements (Rule 240, 15c2-12).
- Santa Cruz Mid-County Groundwater Agency has satisfactory title to all owned assets, and there are no liens or encumbrances on such assets nor has any asset or future revenue been pledged as collateral, except as disclosed to you.
- We have complied with all aspects of grant agreements and other contractual agreements that would have a material effect on the financial statements in the event of noncompliance.

mitten.

Treasurer

Executive Staff

December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 4.3

Title: Approve 2023 MGA Board Meeting Schedule

Recommended Board Action: Approve the 2023 MGA Board Meeting Schedule.

Staff proposes the following Board meeting dates for the MGA in 2023: March 16th, June 15th, September 21st, and December 14th, with all meetings starting at 6:00 p.m.

In-person meetings will be held at the Capitola Branch of the Santa Cruz Public Libraries at 2005 Wharf Road in Capitola.

Recommended Board Action

1. By MOTION and roll call vote, approve the 2023 MGA Board Meeting Schedule.

Submitted by: Tim Carson Program Director Regional Water Management Foundation December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 4.4

Title: Approve Policy for Reviewing Well Permits Under Executive Order N-7-22

Attachments:

1. Policy for Reviewing Well Permits Under Executive Order N-7-22

Recommended Board Action: Approve the Policy for Reviewing Well Permits Under Executive Order N-7-22.

Background:

At the September 15, 2022, Board meeting, the Board approved the Policy Framework and authorized staff to finalize a policy, effective immediately, to respond to MGA responsibilities under Executive Order N-7-22. Staff reported that it would bring a Policy to the December 15, 2022, Board meeting for approval.

Discussion:

The Policy for Reviewing Well Permits Under Executive Order N-7-22 addresses three comments received by the Board on the Policy Framework on September 15, 2022: 1) clarification of the process in the event the MGA Executive Team does not unanimously concur with the Planner's recommendation for approval of a small volume replacement well; 2) additional clarification that the review only applies to wells that would extract greater than 2 acre-feet per year; and 3) clarifies that there will be no further process for appeals after the Board has acted on an application. Staff made a revision to clarify the point of contact during application review and made non-substantive revisions to standardize terminology in the Policy.

Recommended Board Action:

1. BY MOTION, approve the Policy for Reviewing Well Permits Under Executive Order N-7-22.

Submitted by: Rob Swartz Senior Planner Regional Water Management Foundation

> On behalf of the MGA Executive Staff Ron Duncan, General Manager, Soquel Creek Water District

Ralph Bracamonte, District Manager, Central Water District Rosemary Menard, Water Director, City of Santa Cruz Sierra Ryan, Water Resources Manager, County of Santa Cruz


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Policy for Reviewing Well Permits Under Executive Order N-7-22

PURPOSE AND APPLICABILITY

As a Groundwater Sustainability Agency (GSA), the Santa Cruz Mid-County Groundwater Agency (MGA) is required by Executive Order N-7-22, signed by Governor Gavin Newsom on March 22, 2022, to provide written verification that groundwater extraction by a new proposed well or alteration of an existing well would not be inconsistent the Groundwater Sustainability Plan adopted by the MGA.

The Policy for Reviewing Well Permits Under Executive Order N-7-22 is limited to the review of applications received from Santa Cruz County Environmental Health. This Policy shall remain in effect so long as Executive Order N-7-22 remains in effect.

POLICY FOR REVIEWING WELL PERMITS UNDER EXECUTIVE ORDER N-7-22

For applications received from Santa Cruz County Environmental Health, the MGA Senior Planner (Planner) is directed as follows:

- 1) The Planner will review the application. The Planner, acting as the reviewer and point of contact on behalf of the MGA, can request additional information from either Environmental Health or the applicant, if necessary. The process for determination will be as follows:
 - a) For small volume replacement wells:

IF the application is for a replacement well (as defined by Environmental Health in the well application paperwork),

AND the well will be drilled at the same depth or deeper than the existing well, AND the total water expected to be pumped will be under 10 AFY,

THEN, the Planner can recommend approval, indicating that the well is NOT inconsistent with the GSP.

The Planner will notify the MGA Member Agency Executive Staff of the decision and if no one objects, the Planner will return the signed form to Environmental Health.

IF any member of the MGA Member Agency Executive Staff objects to the Planner's recommendation, the Planner will present the recommendation to the Board at the next Board meeting for their final approval along with any mitigations they recommend. The Planner will then return the signed form to Environmental Health.

b) For large volume replacement wells:

IF the application is for a replacement well (as defined by Environmental Health in the well application paperwork),

AND the well will be drilled at the same depth or deeper than the existing well, AND the total water expected to be pumped will be over 10 AFY,

THEN, the Planner can recommend approval, indicating that the well is NOT inconsistent with the GSP.

The Planner will present the recommendation to the Board at the next Board meeting for their final approval along with any mitigations they recommend. The Planner will then return the signed form to Environmental Health.

c) For any new wells that will extract greater than 2 acre-feet per year and are replacing an existing water source:

IF the application is for a new well (as defined by Environmental Health in the well application paperwork)

AND the well will be used to offset an existing water use (municipal, surface water diversion, spring) that also originates from within the Basin

THEN, the Planner can make a discretionary decision about whether the application is inconsistent with the GSP.

The Planner will present the recommendation to the Board at the next possible Board meeting for their final approval along with any mitigations they recommend. The Planner will then return the signed form to Environmental Health.

d) For any new wells that will extract greater than 2 acre-feet per year and are representing a new water use:

IF the application is for a new well (as defined by Environmental Health in the well application paperwork),

AND the well will create a new use of water in any amount,

THEN, the Planner can recommend indicating that the well IS inconsistent with the GSP. The Planner will present the recommendation to the Board at the next Board meeting for their final approval. The Planner will then return the signed form to Environmental Health.

- e) If the Board believes additional analysis is required: For any application brought to the Board, the Board can direct the Planner to request additional information from the applicant or Environmental Health and return with that information at the next Board meeting.
- 2) The applicant can attend the Board meeting at which their well application will be discussed. Given that the applicant can make comments to the Board, and the Board will be making the final decision for any applications found to be inconsistent with the GSP, there will be no further process for appeals.
- 3) With the limited alternatives proposed in Step 1 a d, the information provided by Environmental Health for each application, and the expectation that the MGA will not receive many applications, staff does not think that there will need to be a cost recovery method at this time.

December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 5.1

Title: Approve Proposed Amendment #2 to the Fund Agreement between MGA and County of Santa Cruz

Attachments:

1. None

Recommended Board Action: Authorize the Board Chair to execute a second amendment to the Fund Agreement with the County of Santa Cruz for monitoring, administrative and planning services, and data management system.

Background:

The Santa Cruz Mid-County Groundwater Agency (MGA) entered into an Agreement with the County of Santa Cruz establishing roles, responsibilities and funding for selected monitoring, data management, and administration and planning that support the implementation of the Groundwater Sustainability Plan. The MGA Board approved the Agreement on March 18, 2021, and approved an amendment (#1) to the Agreement on June 15, 2022. Note, both the terms "Fund" and "Revenue" have been used interchangeably in prior Board discussions and memos in reference to this Agreement. Amendment #1 added work to be performed, extended the term of the agreement from December 31, 2022, to June 30, 2025, and increased the total to \$1,321,179.20.

Table 1 (below) summarizes the Amendment #1 contract amount changes.

	Agreement 3/15/2021	Amendment #1 June 15, 2022					
Vendor	Total	Added Amount	New Total	Comment			
Balance Hydrologics	\$164,975.20	\$0.00	\$164,975.20	Stream gages siting/installation and support related to the construction of new shallow monitoring wells			
Kisters	\$96,715.00	\$47,500.00	\$144,215.00	Data Management System development and hosting; Amendment 1 added services/term			
Storesund Construction	Not included	\$252,442.00	\$252,442.00	Well construction contractor			
RWMF	Not included	\$759,547.00	\$759,547.00	GSA Administration and Planning			
Total	\$261,690.20	\$1,059,489.00	\$1,321,179.20				

Discussion:

The proposed Amendment #2 would increase the Balance Hydrologics (Balance) contract amount by \$52,950 for reasons described in this memo. The proposed amendment reduces the number of wells to be constructed by Storesund Construction (Storesund) from seven to six but does not decrease the construction contract total because the final invoice has not yet been approved and the precise final amount is not yet known. However, the construction costs are estimated to be approximately \$31,000 less than the amount in the Agreement. Accounting for the Balance contract overage and the estimated Storesund total cost, the net increase in Fund Agreement is \$21,469.

Balance Hydrologics

In performing the requested services, Balance experienced unanticipated challenges and cost overages. The Balance budget was developed in 2020, before the final locations of the monitoring stations were identified and prior to some specific details being known regarding the well construction. The causes of cost over runs include:

- The original scope was for five stream gages, ultimately it was determined that six were needed.
- Site selection including landowner agreements, particularly for the wells as the MGA wanted easements, proved more challenging and time consuming than anticipated. Several sites that were investigated ultimately fell through. In the end, all of the well sites ended up on public property, which required Right of Way surveys and a longer process than originally anticipated.
- Construction oversight time was significantly longer than anticipated for several reasons:
 - The encroachment permits for the sites in the Right of Way had limited working hours, causing most sites to take more days than anticipated.
 - The selected driller used different equipment than Balance had anticipated, which slowed the drilling further.
 - Well development was done by hand rather than with a rig, which added further time.

Table 2 presents the difference between the original budgeted cost and the anticipated total cost.

Task Number and Description	Budgeted Labor Costs For Task	Anticipated Total Costs For Task	Amount Over For Task		
Task 1. Site selection	\$19,200.00	\$30,120.00	\$10,920.00		
Task 2. Stream gauge deployment	\$72,225.00	\$69,993.00	(\$2,232.00)		
Task 3. Shallow monitoring well design, specifications, and bid assistance	\$56,630.00	\$99,956.00	\$43,326.00		
Task 4. Data collection training	\$6,575.00	\$6,575.00	\$0.00		
Task 5. Project management and administratio	on \$9,060.00	\$9,996.00	\$936.00		
TOTAL LA	BOR \$163,690.00	\$216,640.00	\$52,950.00		
Expe	nses \$1,285.20	\$1,285.20	\$0.00		
GRAND T	OTAL \$164,975.20	\$217,925.20	\$52,950.00		

Table 2. Balance Hydrologics Task Amounts

Pending the approval by the MGA Board of the Agreement Amendment #2, the County will amend the Balance contract to increase the amount to \$217,925.60.

Storesund Construction

Amendment #1 added the contract with Storesund to install seven (7) shallow monitoring wells in the Basin. In November, the County issued a contract change order with Storesund that reduced the number of wells to be installed to six (6) due to complications that impeded the well drilling at one site and related changes that reduced the total contract amount. Amendment #2 would modify the Fund Agreement accordingly to state the number of wells to be installed as six (6). Because the Storesund final invoice is not yet approved, no changes are proposed at this time to the contract total in the Fund Agreement.

Grant Funding for Basin Monitoring

\$30,000 range. The balance of the MGA's general reserves at the start of the fiscal year 2022-2023 is \$1,919,451.

Recommended Board Action:

1. BY MOTION, Authorize the Board Chair to execute a second amendment to the Fund Agreement with the County of Santa Cruz for monitoring, administrative and planning services, and data management system.

Submitted by: Sierra Ryan Water Resources Manager County of Santa Cruz **Tim Carson** Program Director RWMF

On behalf of the MGA Executive Staff

Ron Duncan, General Manager, Soquel Creek Water District Ralph Bracamonte, District Manager, Central Water District Rosemary Menard, Water Director, City of Santa Cruz Sierra Ryan, Water Resources Manager, County of Santa Cruz December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 5.2

Title:Approve Consultant Selection for Basin Stream Monitoring and Related
Services and Authorize Execution of Contract

Attachments:

- 1. Trout Unlimited Cover Letter and Proposal
- 2. Trout Unlimited Presentation

Recommended Board Action: By MOTION and roll call vote, approve the selection of Trout Unlimited for Basin Stream Monitoring and Related Services and authorize the General Manager of Soquel Creek Water District to finalize contract negotiations and authorize the Board Chair to execute the contract for professional services.

Background:

Two contracts related to streamflow monitoring in the Santa Cruz Mid-County Basin end in 2022: Trout Unlimited (August 2022) was conducting streamflow monitoring along Soquel Creek, and Balance Hydrologics supported the installation and establishment of new streamflow monitoring stations in the Basin (December 2022).

On October 28, 2022, the MGA released a Request for Proposals (RFP) for Streamflow Monitoring and Related Services. Three proposals were received and found to be responsive by member agency staff and the Regional Water Management Foundation (RWMF) staff. Proposals were evaluated against the following criteria: qualifications as they relate to the project (40%); project understanding and technical approach (20%); ability to provide the required services in a timely matter (20%); and, the proposed fee for services (20%). The MGA's Procurement Policy allows that qualifying consultants could receive a local business preference of up to 6%.

Consultant interviews were conducted by member agency staff and the RWMF Senior Planner. All three proposing consultants possess the necessary qualifications and experience and are capable of the carrying out the proposed services. Following interviews, it was determined that the proposal from Trout Unlimited best meets the needs of the MGA.

The proposed term of the professional services agreement is three years. Under the MGA's Procurement Policy, professional services may be procured for up to three-

years, with an option to extend into one or two additional years provided that performance is satisfactory and pricing remains competitive.

The attached proposal by Trout Unlimited provides information on the organization and its proposed approach to the streamflow monitoring and related services.

Recommended Board Action:

1. By MOTION and roll call vote, approve the selection of Trout Unlimited for Basin Stream Monitoring and Related Services and authorize the General Manager of Soquel Creek Water District to finalize contract negotiations and authorize the Board Chair to execute the contract for professional services.

Submitted by: Tim Carson Program Director Regional Water Management Foundation

On behalf of the MGA Executive Staff

Ron Duncan, General Manager, Soquel Creek Water District Ralph Bracamonte, District Manager, Central Water District Rosemary Menard, Water Director, City of Santa Cruz Sierra Ryan, Water Resources Manager, County of Santa Cruz



November 18, 2022

Santa Cruz Mid-County Groundwater Agency 5180 Soquel Dr, Soquel, CA 95073 Attn: Sierra Ryan

Re: Request for Proposals for Streamflow Monitoring and Related Services

Dear Santa Cruz Mid-County Groundwater Agency,

Please accept Trout Unlimited's (TU's) proposal to perform streamflow monitoring and related services in the Santa Cruz Mid-County Groundwater Basin (Basin). In the attached proposal we have included (1) TU's <u>project understanding</u> description of the streamflow monitoring and related services needed for the project, (2) TU's <u>technical approach</u> and methodology to complete the work tasks outlined in the RFP, (3) a brief overview of the <u>consultation team</u> and information on our national and local offices, (4) a description of TU's <u>experience</u> in specific relevant projects that the proposed team has worked on within the past seven years, (5) three specific project reference contacts, and (6) a budget and fee schedule that provides the total estimated budget for the project broken down by task.

TU is excited for the opportunity to work on this project because the streamflow and groundwater monitoring data collected will be used to inform evaluations of sustainable management criteria for the depletion of interconnected surface water. This type of work aligns with our research interest in other coastal watersheds, such as the Russian and Navarro rivers, and is one of our main research, project development, and policy focuses.

TU has a strong record of working with regional, state, and federal agency staff to evaluate and protect our nation's valuable and vulnerable water resources, such as our previous work monitoring streamflow in Soquel Creek with the Santa Cruz Mid-County Groundwater Agency. TU's California Conservation Hydrology Program operates a growing network of over 70 streamflow gages and 14 groundwater monitoring wells in watersheds like this Basin and our program specializes in measuring low flows during the dry season.

Thank you for your consideration, we look forward to the opportunity to work with the Santa Cruz Mid-County Groundwater Agency again.

Sincerely,

Brian Johnson California Director Trout Unlimited



Proposal for Streamflow Monitoring and Related Services Santa Cruz Mid-County Groundwater Agency

Project Understanding

Trout Unlimited (TU) understands that the Santa Cruz Mid-County Groundwater Agency (MGA) is seeking proposals to perform streamflow monitoring and related services in the Santa Cruz Mid-County Groundwater Basin (Basin) to inform evaluations of sustainable groundwater management, as part of the MGA's 2021 Groundwater Sustainability Plan (GSP). The goal of the MGA's GSP is to avoid undesirable results for five sustainability indicators: groundwater level declines, groundwater storage reductions, interconnected surface water depletion, seawater intrusion, and water quality degradation. TU understands that the Basin's two most important sustainability indicators are seawater intrusion and interconnected surface water depletion, and this project will collect streamflow and shallow groundwater measurements to monitor streamflow interaction related to groundwater extractions, monitor stream conditions related to fish habitat, and help preserve other beneficial uses of surface water.

This contract will monitor streamflow conditions at six (6) existing stream monitoring stations and groundwater conditions at eleven (11) existing shallow monitoring wells for 3 years. The contract also includes equipment management (removal, calibration, and re-installations of the six existing stream monitoring stations), rating curve development, data reporting, presentations, and project communication.

Technical Approach

The scope of work below describes TU's approach for monitoring, calibrating and data reporting at the six (6) stream monitoring stations over the next 3 years. The approach includes maintenance of these stations, collecting streamflow data and other field measurements, data downloading and management, rating curve and streamflow data development, reporting, presentation, and project communication.

Task 1 – Project Coordination, Administration, and Management

TU will provide oversight and contract administration, including but not limited to scheduling, coordinating project team communication, administering the contract, tracking, invoicing, reporting, and review of all relevant sections of the GSP provided by staff and the materials pertaining to the installation, monitoring, and reporting at the six (6) stream gages.

Task 1 Deliverables

• Participation in project-related calls.

• Quarterly invoices for services in compliance with DWR requirements for grant reporting as specified by the MGA.

Task 2 – Streamflow Monitoring, Data Collection, and Reporting

TU will manage a gage network of six (6) streamflow gages in the Bain for three years during the months April - November, beginning in 2023 (following USGS standards for gage installations and streamflow data collection and guidelines provided in the MGA's GSP). TU will measure discharge, specific conductance, and water temperature at monthly intervals during the field season (April – November). During site visits TU field crews will check the condition of the monitoring stations, download data from the instruments, take staff plate readings and photo document reach conditions. Field data will be uploaded to TU's field computers and to TU's hydrologic records database upon return to the office, field data will be quality controlled and used to develop rating curves of flow as a function of stage. The following bullet points provide additional details for this task:

- TU will conduct monthly site visits during the dry season (April November or first significant rainfall) to check the condition of the monitoring stations, download data from the instruments, and record specific conductance and temperature.
- At each site visit, TU will visit the pressure transducer and its housing to check and ensure they are in good working order. Any necessary repairs will be made at the time of site visits. Photos of the site and surrounding reach will be taken to document channel conditions. Manual staff plate readings will be taken at every visit for validation and calibration of the pressure transducer. Manual streamflow measurements will also be taken during every visit, using a SonTek Flow Tracker 2 handheld Acoustic Doppler Velocimeter, and following methods outlined by USGS and guidelines provided in the MGA's GSP. Measurements of specific conductance and temperature will be made during all site visits using a handheld YSI sonde.
- TU will download data from the stream gages and any accompanying barometric pressure transducers. Each type of data collected will be stored in TU's hydrologic records database upon return to the office.
- TU will remove the monitoring instrument annually in advance of the first large rainfall event; the staff plate and stilling well will remain in place. The weather will be monitored at the end of the dry season to anticipate when larger storms are arriving, and site visits for removal will be scheduled prior to these events.
- In the event of extended drought in which low-flow conditions persist, TU will consult with the MGA about extending the data collection season and removal of the instruments.
- TU will re-installed instruments annually prior to April 1.
- TU will provide notice to property owners in advance of field visits.
- TU will finalize preliminary ratings curves for each of the six (6) sites by the end of Year 1, 2 and 3 (January 2024, 2025 and 2026). Streamflow records are developed via rating

curves of flow as a function of stage, and each rating curve and flow data set is updated and reviewed after each field visit to ensure data accuracy. 15-minute stage data will be compiled into a continuous record, then corrected according to staff plate readings and other field observations. Corrected stage data will be used to develop the rating curves that relate stage to streamflow; these rating curves will be used to produce 15-minute streamflow hydrographs for the dry season at each site.

- TU will enter monitoring data for all project-related fields, including water depth, flow, temperature and specific conductance, into the Water Information Systems by Kisters (WISKI) data management system.
- TU will produce a brief report (one to two pages) at the end of the project period to summarize results, describing streamflow conditions in the study area during the dry season for inclusion in the annual report.
- TU will conduct a brief presentation of the annual streamflow monitoring summary presentation to the MGA Board.

Task 2 Deliverables

- Finalized ratings curves at six (6) sites.
- Finalized streamflow datasets for six (6) sites.
- Data from monitoring instruments logging data at 15-minute intervals for water temperature, stage and streamflow datasets at six (6) streamflow gaging stations, during the dry season, April through October. Data from manual measurements of specific conductance and temperature.
- Annual streamflow summary report (text of one to two pages) describing surface water conditions during the dry season, approximately April through November.
- Annual streamflow monitoring summary presentation to the MGA Board.

Task 3 (a and b) – Shallow Groundwater Monitoring, Data Collection, and Reporting at 11 locations

TU will monitor groundwater levels at 11 shallow monitoring wells in the Mid-County Basin at quarterly intervals. The following bullets provide details for this task:

- Quarterly site visits to 11 shallow monitoring wells in the Mid-County Basin.
- Data download from the data loggers on to TU's field computers, and then uploaded to TU's hydrologic database following site visits.
- Manual measurement of groundwater level using a water level sounder to measure the water surface level in relation to a top-of-well reference point.
- Data will be compiled in excel worksheets and uploaded to WISKI.

Task 3 Deliverables

• Data will be compiled in excel worksheets and uploaded to WISKI at the end of the project contract.

Task 4 – Coastal Drought Monitoring (at no cost to the MGA)

TU is currently in the process of developing a research proposal for the UC Climate Action Research Proposal RFP in partnership with Dr. Eric Palkovacs (UC Santa Cruz), Dr. Noah Finnegan (UC Santa Cruz), Dr. Stephanie Carlson (UC Berkeley), Dr. David Dralle (US Forest Service), and Dr. Haley Ohms (TU), that would examine streamflow, groundwater dynamics/geology, fisheries life history and climate change resiliency in coastal California. If the MGA is interested in the project, the data collected for this contract could be used in the research proposal to better understand drought conditions in the region. The UC Climate Action Research Proposal team believes our work could bring awareness to the Santa Cruz Mountains as a place of climate resilience, which could potentially bring additional resources to the region for restoration and fisheries recovery.

Additionally, TU is developing drought research and policy as a member of the Salmon and Steelhead Coalition (a partnership between TU, The Nature Conservancy and Cal Trout). If the MGA is interested in this work, the data collected for this contract could be used to help inform drought analysis to develop new policies for drought management plans. This task requires no funding from the MGA and is completely optional to the project. TU is open to discussing this task in more detail if the MGA is interested in it.

Consultant Team

Trout Unlimited

Trout Unlimited (TU) is a national coldwater fisheries conservation organization with over 153,000 members nationwide (over 10,000 in California) and over 200 professional staff nationwide (20 in California) dedicated to conserving, protecting, and restoring North America's trout and salmon fisheries and their watersheds. TU's national office is located in Arlington, Virginia, and California office is located in Emeryville.

TU's Conservation Hydrology Program manages and operates one of the largest networks of streamflow gages in California, with over 70 streamflow gages and 14 groundwater monitoring wells in coastal and headwater streams (likely the largest non-governmental gage network of its kind in the state). TU's gaging record dates to 2010 (at a subset of sites), and through the years TU has developed strong relationships with state and regional agencies, resource conservation districts, and other non-profits. Agencies such as the State Water Resources Control Board and the California Department of Fish and Wildlife rely on data from TU to understand summer streamflow conditions and to respond to dire drought conditions in headwater streams. The following TU staff will provide the necessary capacity and expertise to complete this project (please see the attached staff CVs for more information on the project's key scientific staff):

Conservation Hydrologist, Mia van Docto will manage and oversee the project's contract, equipment installations/removals, data collection, data analysis, data management, project communications, annual conditions report and presentation. Ms. van Docto manages TU's Conservation Hydrology Program and works out of TU's Emeryville office.

Hydrologist/Associate Scientist, Krysia Skorko will provide support in data analysis, data management and reporting. Ms. Skorko leads TU's Sierra Headwaters regional streamflow monitoring program and works out of TU's Truckee office and will be doing data analysis remotely.

Conservation Associate Scientist, Tony Vojtech will lead field data collection, including streamflow and ground water monitoring. Mr. Vojtech manages TU's field data collection throughout the coastal gage network and works out of TU's Emeryville office.

Conservation Hydrology Associate, Philip Wasem will provide field support with equipment installations and removals. Mr. Wasem assists with gage installation and streamflow data collection throughout TU's gage network and works remotely in association with TU's Emeryville office.

Conservation Hydrology Interns, TBD will provide field support to the Conservation Associate Scientist and Conservation Hydrologist. TU's Conservation Hydrology Interns work with TU for 6 months on a variety of streamflow monitoring projects. The goal of TU's internship program is to expose early professionals to the conservation field. TU's Conservation Hydrology Interns work out of TU's Emeryville office but spend most of their time in the field.

TU Grant Operations Manager Bonnie Teglas will provide support with administering the contract agreement, insurance certificates, DIR reporting, and other grant and contract management support. Ms. Teglas works out of TU's Truckee office and will be doing administrative work remotely.

TU California Grant Accountant, Krystal Wanzo will provide accounting and invoicing support. The project will be organized and accounted for through Trout Unlimited's financial system. This system captures all project specific financial activity including time keeping, expenses, and cash receipts. Trout Unlimited is subject to an annual financial audit and is considered a low-risk auditee. Ms. Wanzo works out of TU's Emeryville office.

Experience

As mentioned above, TU is currently operating a large gage network throughout coastal California and the Sierra Headwaters. TU works in partnership with various federal, state and regional agencies, as well as resource conservation districts and NGOs. The following list includes a subset of projects that TU has been involved in within the past seven (7) years. The projects listed below do no include all of TU's Conservation Hydrology current work, projects were selected to high light aspects of our work portfolio. Each project listed below includes the proposed team member and a description of the role/work they performed.

Soquel Creek Streamflow Monitoring: TU managed and operated a streamflow gage network of 4 gages in the Soquel Creek watershed for six years (from 2017 – 2022), in partnership with the Santa Cruz Resource Conservation District and then as a contractor for the Santa Cruz Mid County Groundwater Agency. Staff roles in the project include:

- Mia van Docto managed the project's contract, equipment installations, data collection, data analysis, data management, project communications, and final project streamflow conditions report.
- Krysia Skorko provide support with data analysis, data management and reporting.
- Tony Vojtech led field data collection and transfer to TU's hydrologic records database.
- Krystal Wanzo prepared project invoices, and accounting services including all project specific financial activity including time keeping, expenses, and cash receipts.
- *Note this is the only project listed that is not currently active.

Russian River Water Resources Coho Partnership – Streamflow and Groundwater Monitoring: TU has been managing and operating a streamflow gage network of 30 gages in the lower Russian River watershed for 12 years (from 2010 – 2022) as member of the <u>Russian River Water</u> <u>Resources Coho Partnership</u> (the Partnership). The Partnership is a multi-disciplinary collaboration between TU, CA Sea Grant, Occidental Arts and Ecology Center, and Sonoma and Gold Ridge Resource Conservation Districts that supports our local community of agricultural producers and private landowners, while working towards the recovery of coho salmon within the Russian River watershed. The Partnership has been using the best available science to develop practical solutions to human water needs and instream flow impairment since 2009.

Trout Unlimited's Conservation Hydrology team (formerly CEMAR), has been studying the relationships between streamflow conditions and human water use in five project watersheds in Sonoma County since 2010. In the first few years of our work, TU investigated the magnitudes, timing, and frequency of high and lows flows in each project watershed to characterize the flow regime of each stream. In more recent years, TU's work has focused on studying low flow conditions during the summer dry season, to investigate the impacts of the recent drought and how water management practices and groundwater pumping influence streamflow conditions. Additionally, TU streamflow data is used by our partners to study the timing of significant biological thresholds, such as pool connectivity and over-summer survival.

Staff roles in the project include:

- Mia van Docto is the lead hydrologist in the partnership and manages the project related grants and contracts, equipment installations, data collection, data analysis, data management, project communications, and hydrologic report.
- Krysia Skorko provides support with data analysis, data management, project communications and reporting.
- Tony Vojtech leads field data collection and transfer to TU's hydrologic records database and participated in project related calls and communications.
- Philip Wasem assists with gage installations, data collection and wetted habitat surveys.
- Conservation Hydrology interns assist with field data collection and entry and wetted habitat surveys.
- Krystal Wanzo prepares project invoices, and accounting services including all project specific financial activity including time keeping, expenses, and cash receipts.
- Bonnie Teglas provides support with administering the contract agreements, insurance certificates, DIR reporting, and other grant and contract management support.

Porter Creek Streamflow Enhancement Project

TU has been managing and operating a streamflow network of 5 gages in Porter Creek since 2017 in partnership UC Berkeley and Sonoma Resource Conservation District to develop a robust, scientifically defensible, long-term Streamflow Enhancement Plan for Porter Creek to guide operation of a flow enhancement project in perpetuity. Project activities include installation of a permanent gage station below the flow enhancement release point that will serve as the primary reference point for setting the timing and rate of flow releases each year; a two-year monitoring study of fish and water quality responses to flow augmentation to determine the optimal flow-release schedule for fisheries benefits; and development of the Streamflow Enhancement Plan.

Staff roles in the project include:

- Mia van Docto is the lead hydrologist in the partnership and manages the project related grants and contracts, equipment installations, data collection, data analysis, data management, project communications, and hydrologic report.
- Krysia Skorko provides support with data analysis, data management, project communications and reporting.
- Tony Vojtech leads field data collection and transfer to TU's hydrologic records database, intern training and support, and participation in project related calls and communications.
- Philip Wasem assists with gage installations, data collection and wetted habitat surveys.
- Conservation Hydrology interns assist with field data collection and entry and wetted habitat surveys.
- Krystal Wanzo prepares project invoices, and accounting services including all project specific financial activity including time keeping, expenses, and cash receipts.

• Bonnie Teglas provides support with administering the contract agreements, insurance certificates, DIR reporting, and other grant and contract management support.

Navarro River Streamflow Enhancement Partnership - Streamflow and Groundwater Monitoring

TU has been managing and operating a streamflow gage network of up to 22 gages (12 active) and nine ground water monitoring loggers in the Navarro watershed for 10 years (since 2013) as member of the Navarro River Streamflow Enhancement Partnership (the Partnership). The Partnership includes the Mendocino County Resource Conservation District, The Nature Conservancy, and Trout Unlimited, with funding support from the California Wildlife Conservation Board (WCB), The Nature Conservancy, the S.D. Bechtel, Jr. Foundation, and the California Salmon and Steelhead Coalition. The Partnership aims to (1) restore more natural flows in rivers and streams within the Navarro watershed; (2) support conditions to increase the viability of juvenile coho salmon and steelhead trout and returning adult fish; and (3) increase water supply reliability for water users. Working with landowners on a voluntary basis, the Partnership conducts local outreach and education, monitors fish and streamflow, analyzes water use and needs, and develops and implements streamflow and habitat restoration projects in the Navarro watershed.

Trout Unlimited's Conservation Hydrology team (formerly CEMAR), has been studying the relationships between streamflow conditions and human water use in the since 2013. In the first few years of our work, TU investigated the magnitudes, timing, and frequency of high and lows flows in each project watershed to characterize the flow regime of each stream. In more recent years, TU's work has focused on studying low flow conditions during the summer dry season, to investigate the impacts of the recent drought and how water management practices and groundwater pumping influence streamflow conditions. Additionally, TU studying groundwater and surface water interactions as part of the Flynn Creek Groundwater Infiltration Project. This project is employing low tech activities to increase groundwater monitoring stations to document the effectiveness of this project.

Staff roles in the project include:

- Mia van Docto is the lead hydrologist in the partnership and manages the project related grants and contracts, equipment installations, data collection, data analysis, data management, project communications, and hydrologic report.
- Krysia Skorko provides support with streamflow and groundwater data analysis, data management, project communications and reporting.

- Tony Vojtech leads field data collection and transfer to TU's hydrologic records database, intern training and support, and participation in project related calls and communications.
- Philip Wasem assists with gage installations, data collection and wetted habitat surveys.
- Conservation Hydrology interns assist with field data collection and entry and wetted habitat surveys.
- Krystal Wanzo prepares project invoices, and accounting services including all project specific financial activity including time keeping, expenses, and cash receipts.
- Bonnie Teglas provides support with administering the contract agreements, insurance certificates, DIR reporting, and other grant and contract management support.

Pescadero and Butano Creek Streamflow Enhancement Project and Project Monitoring: TU manages and operates a gage network of 4 gages in the Pescadero Creek watershed, and 2 gages in the Butano Creek watershed in partnership with the San Mateo Resource Conservation District and TomKat Ranch. The project gages data are used by TU and project partners to understand streamflow conditions and to document the flow benefits of streamflow enhancement projects (pre and post project implementation).

Staff roles in the project include:

- Mia van Docto is the lead hydrologist in the partnership and manages the project related grants and contracts, equipment installations, data collection, data analysis, data management, project communications, and hydrologic report.
- Krysia Skorko provides support with streamflow and groundwater data analysis, data management, project communications and reporting.
- Tony Vojtech leads field data collection and transfer to TU's hydrologic records database, intern training and support, and participation in project related calls and communications.
- Conservation Hydrology interns assist with field data collection and entry and wetted habitat surveys.
- Krystal Wanzo prepares project invoices, and accounting services including all project specific financial activity including time keeping, expenses, and cash receipts.
- Bonnie Teglas provides support with administering the contract agreements, insurance certificates, DIR reporting, and other grant and contract management support.

Faith Valley Meadow Streamflow Monitoring: TU manages and operates a streamflow gage network of 3 gages in Faith Valley Meadows in the upper West Fork Carson River watershed, currently in its 4th year of operation in partnership with American Rivers. Data being collected will monitor the effects of meadow restoration on an upstream flow release and provide information for downstream water rights holders.

Staff roles in the project include:

- Krysia Skorko is the lead hydrologist in the partnership and manages the project related grants and contracts, equipment installations, data collection, data analysis, data management, project communications, and hydrologic reporting.
- Mia van Docto provides support with data analysis, project communications and reporting.
- Krystal Wanzo prepares project invoices, and accounting services including all project specific financial activity including time keeping, expenses, and cash receipts.
- Bonnie Teglas provides support with administering the contract agreements, insurance certificates, DIR reporting, and other grant and contract management support.

Project References

Sarah Nossaman, Fisheries Biologist at CA Sea Grant

nossamanpierce@ucsd.edu

Ms. Nossaman is a project partner with TU in the Russian River Water Resources Coho Partnership. CA Sea Grant works closely with TU in developing ecological flow criteria for pool connectivity thresholds in project streams. CA Sea Grant has been studying coho over summer survival in relationship to TU's streamflow data since 2010.

Ted Grantham, Associate Cooperative Extension Specialist and Adjunct Professor UC Berkeley tgrantham@berkeley.edu, https://ourenvironment.berkeley.edu/people/theodore-grantham

Mr. Grantham is a project partner with TU in the Porter Creek Streamflow Enhancement Project. UC Berkeley has been using TU's gage data to understand fish bioenergetics and foraging behavior in relationship to flow augmentation. TU has been working in partnership with Mr. Grantham and UC Berkeley since 2017.

David Hines, Senior Environmental Scientist at California Department of Fish and Wildlife <u>david.hines@wildlife.ca.gov</u>

Mr. Hines has been a partner to TU in fisheries recover efforts for over a decade. CDFW has been using TU's gage data to manage flow releases in the Dutch Bill Creek watershed for fisheries recovery, as well as in other recovery actions within the Russian River Basin. TU and Mr. Hines are currently collaborating on drought monitoring efforts.

Budget and Fee Schedule

The following budget will be applied towards conducting the monitoring, data analysis and reporting outlined in the project proposal narrative, including salary support, travel and supplies to conduct field monitoring.

Personnel

Personnel costs include both salary and fringe benefits for project staff (TU's fringe benefits rate is 49.26%). Personnel costs for Mia van Docto (project manager and lead hydrologist) will support administrative oversight of the project, coordination with project partners, equipment management (removals and re-installation), oversight of field data collection, data analysis and assistance with manuscript and report preparation. Personnel costs for Associate Scientists will include field data collection, data management and assistance with data analysis and project related reports. Personnel costs for field interns will include field data collection, data entry, and equipment maintenance. Personnel costs for Krystal Wanzo and Bonnie Teglas will support administrative oversight, contract management, invoicing and support financial administrative support of the project.

Fringe benefits are calculated using TU's current rate and applied to staff hours spent on the project. Fringe benefits include all health, dental, and vision care, standard vacation and sick leave, unemployment, disability, life insurance, retirement, social security, general liability and all applicable taxes.

Supplies

Supplies costs included expenses that may be needed for field related activities such equipment reinstallations and data collection and cover things such as t-posts, field notebooks, zip ties, screws and rainboots.

Indirect Costs

Indirect costs were calculate using TU's negotiated NICRA rate of 13.84%.

Detailed Project Budget

Table 1 provides a detailed breakdown of project costs, including hourly rates for each category of employee, mileage, supply and indirect costs (mileage fee was determined by the mileage from Emeryville to the Basin and the State's standard mileage reimbursement rate of \$0.625/mile). Table 1 provides details on estimated rate schedules for the consecutive years of work.

Table 1. Detailed Project Budget	
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	Rate	Year 1 Hours	Year 1 Total	Year 2 Hours	Year 2 Total	Year 3 Hours	Year 3 Total	Total Project Hours	Project Total
Task 1 - Project Management									
Conservation Hydrologist	\$77.00	12	\$924.00	12	\$924.00	12	\$924.00	36	\$2,772.00
California Grant Accountant	\$73.00	8	\$584.00	8	\$584.00	10	\$730.00	26	\$1,898.00
California Grant Manager	\$69.00	6	\$414.00	0	\$0.00	6	\$414.00	12	\$828.00
Indirect	13.84%		\$266.00		\$208.71		\$286.21		\$760.92
Task 1 Sub-total			\$2,188.00		\$1,716.71		\$2,354.21		\$6,258.92
Task 2 - Streamflow Monitoring, Data Collection, and Reporting									
Conservation Hydrologist	\$77.00	94	\$7,238.00	100	\$7,700.00	105	\$8,085.00	299	\$23,023.00
Associate Scientist II	\$61.00	40	\$2,440.00	40	\$2,440.00	50	\$3,050.00	130	\$7,930.00
Associate Scientist I	\$52.00	120	\$6,240.00	124	\$6,448.00	124	\$6 <i>,</i> 448.00	368	\$19,136.00
Conservation Hydrology Associate	\$57.00	10	\$570.00	10	\$570.00	10	\$570.00	30	\$1,710.00
Interns	\$30.00	80	\$2,400.00	80	\$2,400.00	80	\$2,400.00	240	\$7,200.00
Travel			\$1,612.00		\$1,612.00		\$1,612.00		\$4,836.00
Supplies			\$200.00		\$200.00		\$200.00		\$600.00
Indirect	13.84%		\$2,864.88		\$2,957.61		\$3,095.32		\$8,917.80
Sub-total			\$23,564.88		\$24,327.61		\$25,460.32		\$73,352.80
Task 3 - Groundwater Monitoring									
Conservation Hydrologist	\$77.00	10	\$770.00	10	\$770.00	15	\$1,155.00	35	\$2,695.00
Associate Scientist II	\$61.00	10	\$610.00	30	\$1,830.00	30	\$1,830.00	70	\$4,270.00
Associate Scientist I	\$52.00	48	\$2,496.00	48	\$2,496.00	48	\$2,496.00	144	\$7,488.00
Interns	\$30.00	40	\$1,200.00	40	\$1,200.00	40	\$1,200.00	120	\$3,600.00
Travel			\$806.00		\$806.00		\$806.00		\$2,418.00
Indirect	13.84%		\$814.07		\$982.92		\$1,036.20		\$2,833.19
Sub-total			\$6,696.07		\$8,084.92		\$8,523.20		\$23,304.19
Task 4 - Regional Drought Monitoring (Optional and no cost to MGA)									
Conservation Hydrologist	\$77.00	0	\$0.00	0	\$0.00	0	\$0.00	0	\$0.00
Sub-total									\$0.00
Project Total			\$32,448.95		\$34,129.23		\$36,337.73		\$102,915.91

Conservation Hydrologist



EDUCATION

- Master in Environmental Planning, University of California, Berkeley, 2013
- Bachelor of Science in Earth Science, University of California, Santa Cruz, 2007

ACADEMIC/PROFESSIONAL APPOINTMENTS

- CA Conservation Hydrologist, Trout Unlimited, 2016-present
- Environmental Scientist/Hydrologist, CEMAR, 2013-2016
- Researcher, UC Berkeley & California Land Stewardship Institute, 2011-2013
- Water Research Intern, UC Berkeley Water Center, 2008-2009
- Earth Sciences Laboratory Instructor, UC Santa Cruz, 2007-2008
- Chancellor's Undergraduate Internship Program Campus Sustainability, UC Santa Cruz, 2005-2006
- Pajaro River Research Assistant, UC Santa Cruz, 2003-2005

SELECTED PROFESSIONAL EXPERIENCE RELATED TO THE REQUEST FOR PROPOSAL

- Lead hydrologist responsible for the management of over 70 streamflow gages and 14 groundwater monitoring
 wells; specializing in ecological flows, drought and using a combination of field-based data, numerical modeling
 and geospatial tools to characterize hydrologic processes, conditions, and human water demands.
- Lead on scientific studies, reports, and water rights analysis; including projects such as the Flynn Creek groundwater infiltration study and the Mill Creek groundwater and surface water interactions study.
- Member of the SB19 Stream Gaging Technical Advisory Committee State Water Resources Control Board
- Member of streamflow enhancement and conservation partnerships, including the Russian River Coho Water Resources Partnership, the Salmon and Steelhead Coalition, and the Navarro River Streamflow Enhancement Partnership.

PUBLICATIONS

Deitch, M., van Docto, M. Obedzinski, M., Nossaman, S., Bartshire, A. 2018. Impact of multi-annual drought on streamflow and habitat in coastal California salmonid streams. Hydrological sciences journal 63 (8), 1219-1235

Deitch, M., van Docto, M., Feirer, S. 2016. A Spatially explicit framework for assessing the effects of weather and water rights on streamflow. Applied Geography (67) 14-26

Deitch, M., Reseburg, R., van Docto, M., Smetak, K., Becker, G. 2014. Importance of spatial and temporal scales in characterizing the hydrologic effects of decentralized water management. River Research and Applications.

AWARDS

UC Berkeley – Dean's Fellowship UC Berkeley – Departmental Fellowship UC Berkeley – Research Fellowship UC Berkeley – Geraldine Knight Scott Research Fellowship

RELEVANT COURSE WORK

Hydrology, Groundwater, Groundwater Contamination, Field Geology, Restoration Ecology, Fluvial Geomorphology, River Restoration, CA Coastal Geology, Geologic Principles, Mineralology, Biogeochemistry, Calculus series, Physics series, GIS Modeling, Aquatic Toxicology, and Environmental Planning

TROUT UNLIMITED

Trout Unlimited (TU) is a national coldwater fisheries conservation organization with extensive experience in planning and implementing stream flow restoration measures to enhance native fish populations throughout the western United States. Through its Western Water Project, TU has worked with farmers, ranchers, irrigators, and irrigation districts to improve flows through on-the-ground projects and transactions.





EDUCATION

- Master of Science in Geology, University of Utah, Salt Lake City, UT, 2010
- Bachelor of the Arts in Geology, Vassar College, Poughkeepsie, NY, 2004

PROFESSIONAL/ACADEMIC EXPERIENCE

- Associate Conservation Scientist II, Trout Unlimited, Emeryville and Truckee, CA 2017-present
- Staff Geomorphologist, Balance Hydrologics Inc, Berkeley, CA, 2013 2017
- Hydrologic Technician, US Forest Service, Sierra, Sequoia, and Tongass National Forests, 2005 2007, 2013
- Research Assistant, University of New Hampshire, Durham, NH, 2011 2012
- Geologic Intern, Questar Corporation, Salt Lake City, UT 2010
- Environmental Compliance Intern, Newmont Mining Corporation, Elko, NV, 2009

SELECTED PROFESSIONAL EXPERIENCE RELATED TO THE REQUEST FOR PROPOSAL

- Responsible for developing and implementing monitoring and scientific studies to support projects that
 conserve water and improve streamflow in California streams vital to wild salmon and trout. Projects include
 water storage, flow release and meadow restoration projects.
- Duties include project design, pre- and post-project monitoring, stream gaging, hydrograph and rating curve development, analysis of surface-groundwater interactions, and analysis of effects of geology and land use characteristics on streamflow.
- Responsible for communication of findings through project team discussions, report writing, partner meetings and presentations.

PUBLICATIONS

- Lightbody AF, Kui L, Stella JC, Skorko KW, Bywater-Reyes S and Wilcox AC (2019) Riparian Vegetation and Sediment Supply Regulate the Morphodynamic Response of an Experimental Stream to Floods. Front. Environ. Sci. 7:40. doi: 10.3389/fenvs.2019.00040
- Skorko, K., Jewell, P.W., and Nicoll, K. (2012): Fluvial response to an historic lowstand of the Great Salt Lake, Utah. Earth Surface Processes and Landforms, Vol. 37, No. 2, p 143-156.
- Jewell, P.W., Skorko, K.W. and J.C. Fernandez (2010): LiDAR Analysis of an Urban Alluvial System: Jordan River, Utah. AEG News, Vol. 53, No. 1, p. 20-22.

AWARDS

- Participant in ExxonMobil's 2013 Guadalupe Mountains Field Course
- NSF Fellowship GK-12 WEST (Water, Environment, Science and Teaching), 2008-2009
- Departmental Honors, Vassar College Department of Geology & Geography, 2004

RELEVANT COURSE WORK

Ecohydrology, Advanced Fate and Transport, Hydrology, Fluid Dynamics, Groundwater Hydrology, Reservoir Characterization and Modeling, Sedimentology and Stratigraphy, Seismic and Sequence Stratigraphy, Tectonic Geomorphology, Geologic Modeling, Paleoclimatology, Physics, Calculus 1-3, Differential Equations, Spatial Statistics.

TROUT UNLIMITED

Trout Unlimited (TU) is a national coldwater fisheries conservation organization with extensive experience in planning and implementing stream flow restoration measures to enhance native fish populations throughout the western United States. Through its Western Water Project, TU has worked with farmers, ranchers, irrigators, and irrigation districts to improve flows through on-the-ground projects and transactions.

Streamflow Monitoring and Professional Services Proposal



Mia van Docto & Krysia Skorko Santa Cruz Mid-County Groundwater Agency Decemper 2, 2022

Agenda Item 5.2.2

Project Understanding



- The Santa Cruz Mid-County Groundwater Agency (MGA) is seeking • proposals to perform streamflow monitoring and related services in the Santa Cruz Mid-County Groundwater Basin (Basin) to inform evaluations of sustainable groundwater management, as part of the MGA's 2021 Groundwater Sustainability Plan (GSP).
- The goal of the MGA's GSP is to avoid undesirable results for five • sustainability indicators: groundwater level declines, groundwater storage reductions, interconnected surface water depletion, seawater intrusion, and water quality degradation.
- TU understands that the Basin's two most important sustainability indicators are seawater intrusion and interconnected surface water depletion, and this project will collect streamflow and shallow groundwater measurements to monitor streamflow interaction related to groundwater extractions, monitor stream conditions related to fish habitat, and help preserve other beneficial uses of surface water.
- This contract will monitor streamflow conditions at six (6) existing stream • monitoring stations and groundwater conditions at eleven (11) existing shallow monitoring wells for 3 years. The contract also includes equipment management (removal, calibration, and re-installations of the six existing stream monitoring stations), rating curve development, data reporting, presentations, and project communication. 61 of 158

Technical Approach



TU's approach for monitoring, calibrating and data reporting at the six (6) stream monitoring stations over the next 3 years is broken into 4 tasks:

Task 1: Project Coordination, Administration, and Management

TU will provide oversight and contract administration, including but not limited to scheduling, coordinating project team communication, administering the contract, tracking, invoicing, reporting, and review of all relevant sections of the GSP provided by staff and the materials pertaining to the installation, monitoring, and reporting at the six (6) stream gages.

Task 1 Deliverables:

- Participation in project-related calls
- Quarterly invoices



Technical Approach

General timeline for task 2 activities:

March 2023, 2024, & 2025



- TU will contact landowners to share information on the upcoming field season, including approximate site schedule.
- TU will re-installed instruments annually prior to April 1.
- TU will photo document re-installed gages and provide a brief memo/email to MGA about installation.

ation on the ate site schedule. rior to April 1.



April – November 2023, 2024, & 2025



- TU will conduct monthly site visits during the dry season (April 1 • November 30 or first significant rainfall).
- TU will contact landowners before each site visit. \bullet
- TU will collect manual streamflow measurements using a SonTek Flow \bullet Tracker 2 handheld Acoustic Doppler Velocimeter (using standard USGS protocols), and will collect specific conductance and temperature measurements during all site visits using a handheld YSI sonde.
- TU will photo document site conditions and take reoccurring photo ٠ points.
- TU will download data from the pressure transducer and check housing to \bullet ensure they are in good working order. TU will collect staff plate readings.
- Any necessary repairs will be made at the time of site visits. ۲
- Field data will be downloaded onto TU's field tablet computers and \bullet uploaded to TU's database following each site visit.
- TU will update streamflow records following each site visit to ensure • accurate and high-quality data are being collected.

December - March 2023, 2024, & 2025



- TU will remove the monitoring instrument annually in advance of the first \bullet large rainfall event; the staff plate and stilling well will remain in place. The weather will be monitored at the end of the dry season to anticipate when larger storms are arriving, and site visits for removal will be scheduled prior to these events.
- In the event of extended drought in which low-flow conditions persist, TU • will consult with the MGA about extending the data collection season and removal of the instruments.
- TU will finalize rating curves and streamflow datasets for each water year • at the end of the field season.
- TU will write an annual streamflow summary report describing surface ٠ water conditions during the dry season.
- TU will conduct a brief annual streamflow monitoring summary presentation to the MGA Board.
- TU will enter monitoring data for all project-related fields, including water • depth, flow, temperature and specific conductance, into the Water Information Systems by Kisters (WISKI) data management system.



Task 2 Deliverables:

- Finalized ratings curves at six (6) sites. •
- Finalized streamflow datasets for six (6) sites. ullet
- 15-minute data for water temperature, stage and • streamflow from six (6) streamflow gaging stations, during the dry season, April through October. Data from manual measurements of specific conductance and temperature.
- Annual streamflow summary report (text of one to two • pages) describing surface water conditions during the dry season, approximately April through November.
- Annual streamflow monitoring summary presentation • to the MGA Board.
- Data will be compiled in excel worksheets and uploaded \bullet to WISKI at the end of the project contract.

66 of 15



Task 3 (a and b): Shallow Groundwater Monitoring, Data Collection, and Reporting at 11 locations

- TU will monitor groundwater levels at 11 shallow monitoring wells in the Mid-County Basin at quarterly intervals.
- TU will contact landowners before each site visit.
- Data download from the data loggers on to TU's field • computers, and then uploaded to TU's hydrologic database following site visits.
- Manual measurement of groundwater level using a • water level sounder to measure the water surface level in relation to a top-of-well reference point.
- Data will be compiled in excel worksheets and \bullet uploaded to WISKI.

Task 3 Deliverables:

Data will be compiled in excel worksheets and \bullet uploaded to WISKI at the end of the project contract.

Task 4: Coastal Drought Monitoring

This task is could be done at no cost to the MGA and is completely optional.

- TU is currently in the process of developing a research proposal for the UC Climate Action Research Proposal • in partnership with Dr. Eric Palkovacs (UC Santa Cruz), Dr. Noah Finnegan (UC Santa Cruz), Dr. Stephanie Carlson (UC Berkeley), Dr. David Dralle (US Forest Service), Gabe Rossi (UC Berkeley), Monty Schmitt (TNC) and Dr. Haley Ohms (TU).
- The proposal is still in development, but we are thinking of examining streamflow, groundwater dynamics/geology, fisheries life history and climate change resiliency in coastal California.
- If the MGA is interested in the project and if we are awarded funding, the data collected for this contract could be used in the research proposal to better understand drought conditions in the region.
- Additionally, TU is developing drought research and policy as a member of the Salmon and Steelhead • Coalition (a partnership between TU, The Nature Conservancy and Cal Trout).
- If the MGA is interested in this work, the data collected for this contract could be used to help inform drought ٠ analysis to develop new policies for drought management.



March: 2.73 cfs



April: 0.626 cfs





June: 0 cfs



September: 0 cfs

Consultant Team



Trout Unlimited (TU) is a national coldwater fisheries conservation organization (non-profit) with over 153,000 members nationwide (over 10,000 in California) and over 200 professional staff nationwide (20 in California) dedicated to conserving, protecting, and restoring North America's trout and salmon fisheries and their watersheds.

TU strategic planning – the Basin was identified as a priority water for TU on the Central Coast

TU's national office is located in Arlington, Virginia, and California office is located in Emeryville.

TU has an accounting team (Krystal Wanzo and Bonnie Teglas) to support contract administration, accounting and invoicing.

TU's financial system captures all project specific financial activity including time keeping, expenses, and cash receipts.

Trout Unlimited is subject to an annual financial audit and is considered a low-risk auditee.



TU Conservation Hydrology

- TU's Conservation Hydrology Program operates one of the most extensive networks of gages in California.
- Our data is essential to understand streamflow conditions in headwater streams critical to salmonids and inland trout where no other streamflow monitoring is occurring.
- Specialize in dry season monitoring, very low flows and drought conditions.
- State agencies rely on data from TU to understand streamflow conditions and to respond to dire drought conditions.



All Project Watershed

Faith Valley meadow monitoring Humboldt-Toiyabe National Forest, 3 gages

Southern Sierras meadow monitoring Sequoia National Forest, 6 gages



Pescadero Creek, 4 gages

Soquel Creek, 4 ga

70 of 158

Hydrologic studies



Gage network 70+ gages



Streamflow monitoring



Groundwater monitoring



Wetted habitat surveys





Mia van Docto Conservation Hydrologist



Krysia Skorko Hydrologist/Associate Scientist II



Tony Vojtech Associate Scientist

Philip Wasem Conservation Hydrology Associate



Conservation Hydrology Intern

- Ms. van Docto manages TU's Conservation Hydrology Program and works out of ٠ TU's Emeryville office.
- Will manage and oversee the project's contract, equipment installations/removals, • data collection, data analysis, data management, project communications, annual conditions report and presentation.
- Ms. Skorko leads TU's Sierra Headwaters regional streamflow monitoring program and works out of TU's Truckee office and will be doing data analysis remotely.
- Will provide support in data analysis, data management and reporting. •
- Mr. Vojtech manages TU's field data collection throughout the coastal gage • network and works out of TU's Emeryville office.
- Will lead field data collection, including streamflow and ground water monitoring. •
- Mr. Wasem assists with gage installation and streamflow data collection ٠ throughout TU's gage network and works remotely in association with TU's Emeryville office.
- Will provide field support with equipment installations and removals. •
- Will provide field support to the Conservation Associate Scientist and Conservation Hydrologist. TU's Conservation Hydrology Interns work with TU for 6 months on a variety of streamflow monitoring projects. The goal of TU's internship program is to expose early professionals to the conservation field. TU's Conservation Hydrology Interns work out of TU's Emeryville office but spend most of their time in the field.
Sample Related Experience

Soquel Creek Stream Gaging



- Streamflow monitoring
- 4 gages6 voars
- 6 years
- SCRCD & MGA

Russian River Coho Partnership



- Streamflow & groundwater monitoring
- 30 gages
- 12 years
- Ecological flow thresholds & drought
- Partnership with RCDs, CSG, OAEC

Porter Creek Streamflow Enhancement



- Streamflow monitoring
- Flow release
- Partnership with UCB, CSG &SRCD
- Bioenergetics

Navarro Streamflow & Groundwater



- Streamflow & groundwater monitoring
- 18 gages
- 10 years
- Ecological flow thresholds & drought
- Partnership with MCRCD & TNC

Pescadero & Butano Streamflow & DO



- Streamflow & DO monitoring
- 6 gages
- Water rights permitting
- Partnership with SMRCD

73 of 158

	Rate	Year 1 Hours	Year 1 Total	Year 2 Hours	Year 2 Total	Year 3 Hours	Year 3 Total	Total Project Hours	Project Total
Task 1 - Project Management									
Conservation Hydrologist	\$77.00	12	\$924.00	12	\$924.00	12	\$924.00	36	\$2,772.00
California Grant Accountant	\$73.00	8	\$584.00	8	\$584.00	10	\$730.00	26	\$1,898.00
California Grant Manager	\$69.00	6	\$414.00	0	\$0.00	6	\$414.00	12	\$828.00
Indirect	13.84%		\$266.00		\$208.71		\$286.21		\$760.92
Task 1 Sub-total			\$2,188.00		\$1,716.71		\$2,354.21		\$6,258.92
Task 2 - Streamflow Monitoring, Data Co	llection, and	Reporting							
Conservation Hydrologist	\$77.00	94	\$7,238.00	100	\$7,700.00	105	\$8,085.00	299	\$23,023.00
Associate Scientist II	\$61.00	40	\$2,440.00	40	\$2,440.00	50	\$3,050.00	130	\$7,930.00
Associate Scientist I	\$52.00	120	\$6,240.00	124	\$6,448.00	124	\$6 <i>,</i> 448.00	368	\$19,136.00
Conservation Hydrology Associate	\$57.00	10	\$570.00	10	\$570.00	10	\$570.00	30	\$1,710.00
Interns	\$30.00	80	\$2,400.00	80	\$2,400.00	80	\$2,400.00	240	\$7,200.00
Travel			\$1,612.00		\$1,612.00		\$1,612.00		\$4,836.00
Supplies			\$200.00		\$200.00		\$200.00		\$600.00
Indirect	13.84%		\$2,864.88		\$2,957.61		\$3,095.32		\$8,917.80
Sub-total			\$23,564.88		\$24,327.61		\$25,460.32		\$73,352.80
Task 3 - Groundwater Monitoring									
Conservation Hydrologist	\$77.00	10	\$770.00	10	\$770.00	15	\$1,155.00	35	\$2,695.00
Associate Scientist II	\$61.00	10	\$610.00	30	\$1,830.00	30	\$1,830.00	70	\$4,270.00
Associate Scientist I	\$52.00	48	\$2,496.00	48	\$2,496.00	48	\$2,496.00	144	\$7,488.00
Interns	\$30.00	40	\$1,200.00	40	\$1,200.00	40	\$1,200.00	120	\$3,600.00
Travel			\$806.00		\$806.00		\$806.00		\$2,418.00
Indirect	13.84%		\$814.07		\$982.92		\$1,036.20		\$2,833.19
Sub-total			\$6,696.07		\$8,084.92		\$8,523.20		\$23,304.19
Task 4 - Regional Drought Monitoring (Op	otional and n	o cost to N	/IGA)						
Conservation Hydrologist	\$77.00	0	\$0.00	0	\$0.00	0	\$0.00	0	\$0.00
Sub-total									\$0.00
Project Total			\$32,448.95		\$34,129.23		\$36,337.73		\$102,915.91 74 of

December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 5.3

Title: Receive Groundwater Extraction Metering Plan for Non-De Minimis Users

Attachments:

1. Groundwater Extraction Metering Plan

Recommended Board Action: 1) Receive and accept the *Groundwater Extraction Metering Plan Santa Cruz Mid-County Groundwater Basin* written by Geosyntec Consultants and 2) Direct staff to craft a policy for future adoption based on the guidance in the Metering Plan.

Background:

The Groundwater Sustainability Plan (GSP) provides for a groundwater extraction metering program for non-*de minimis* users, defined as those expected to extract more than 5 acre-feet per year, or more than 2 acre-feet per year from wells located in priority areas. Per the GSP, how the metering is to be deployed and monitored is to be defined through the development of a Metering Program.

The firm Geosyntec was selected by the MGA to develop a Metering Plan which would serve as the foundation for a Metering Program, with input from a temporary Board committee. The *Groundwater Extraction Metering Plan Santa Cruz Mid-County Groundwater Basin* (Metering Plan) was developed with feedback from staff, the Board committee, and members of the public who attended one of two public meetings held on the topic in April 2022. All impacted property owners were contacted by mail prior to the public meetings. At its meeting on September 15th, the Board reviewed a draft Metering Plan and asked questions of both staff and Gordon Thrupp of Geosyntec, the consultant working on developing the Metering Plan.

Discussion:

The Metering Plan is now complete and ready to be received by the Board. The contract with Geosyntec will end at the end of this month. Staff is preparing to develop the activities outlined in the Metering Plan into a Metering Policy that the MGA Board will adopt as the legal framework for implementation.

Recommended Board Action

1. BY MOTION and roll call vote, 1) Receive and accept the Groundwater Extraction Metering *Plan Santa Cruz Mid-County Groundwater Basin* written by Geosyntec Consultants and 2) Direct staff to craft a policy for future adoption based on the guidance in the Metering Plan.

Submitted by: Sierra Ryan Water Resources Manager County of Santa Cruz

On behalf of the MGA Executive Staff

Ron Duncan, General Manager, Soquel Creek Water District Ralph Bracamonte, District Manager, Central Water District Rosemary Menard, Water Director, City of Santa Cruz Sierra Ryan, Water Resources Manager, County of Santa Cruz

Agenda Item 5.3.1



engineers | scientists | innovators

GROUNDWATER EXTRACTION METERING PLAN

SANTA CRUZ MID-COUNTY GROUNDWATER BASIN

Prepared for

Santa Cruz Mid-County Groundwater Agency 5180 Soquel Drive Soquel, California 95073

Prepared by

Geosyntec Consultants, Inc. 1111 Broadway, 6th Floor Oakland, California 94607

Project Number: WR3036

December 7, 2022

Groundwater Extraction Metering Plan Santa Cruz Mid-County Groundwater Basin

Prepared for

Santa Cruz Mid-County Groundwater Agency 5180 Soquel Drive Soquel, California 95073

Prepared by

Geosyntec Consultants, Inc. 1111 Broadway, 6th Floor Oakland, California 94607

Thurs

Gordon Thrupp, Ph.D., P.G., C.HG. (CA)

Chelsea Bokman, E.I.T. (CA) Project Engineer

Project Number: WR3036

December 7, 2022

TABLE OF CONTENTS

1.	INTF	RODUC	2TION1				
	1.1	1.1 Metering Objectives1					
	1.2	Applic	ability2				
	1.3	Well R	Registration1				
	1.4	Flown	neters1				
		1.4.1	Flowmeter Types1				
		1.4.2	Minimum Flowmeter Requirements				
		1.4.3	Flowmeter Installation				
		1.4.4	Routine Calibration				
		1.4.5	Costs4				
2.	REP	ORTIN	G4				
	2.1	Data C	Confidentiality4				
3.	ENF	ORCEN	MENT AND PENALTIES				
4.	PROCESS FOR APPEAL						
5.	MET	ERING	G PLAN UPDATES				
6.	REFERENCES						

LIST OF FIGURES

Figure 1:	Priority Management Areas
Figure 2:	Example of an Operation with Multiple Parcels Served by Multiple Wells
Figure 3:	Example Propeller Type Flowmeter
Figure 4:	Typical Installation Configuration

LIST OF APPENDICES

- Appendix A: Metering Plan Overview
- Appendix B: Example Well Registration Form
- Appendix C: Example Groundwater Use Reporting Form

ACRONYMS AND ABBREVIATIONS

AFY	acre-feet per year
Basin	Santa Cruz Mid-County Groundwater Basin
DWR	California Department of Water Resources
GSP	Groundwater Sustainability Plan
Metering Plan	Groundwater Extraction Metering Plan
Metering Policy	Groundwater Extraction Metering Policy
MGA	Santa Cruz Mid-County Groundwater Agency
SGMA	Sustainable Groundwater Management Act

1. INTRODUCTION

The Santa Cruz Mid-County Groundwater Basin (Basin) is classified by the California Department of Water Resources (DWR) as a high priority basin in a state of critical overdraft (DWR 2016). In accordance with California's Sustainable Groundwater Management Act (SGMA), the Santa Cruz Mid-County Groundwater Agency (MGA) was formed to develop and implement a basin-specific Groundwater Sustainability Plan (GSP, MGA 2019). The DWR approved the GSP for the Basin on June 3, 2021. The purpose of the GSP is to develop an approach to achieving the long-term sustainability of the Basin within a 20-year implementation period as measured by locally defined sustainable management criteria.

The GSP identified groundwater pumping for non-de minimis use as a source of uncertainty in the groundwater model and water budget for the Basin. Groundwater pumping from non-de minimis use that was not already reported was estimated indirectly using potential evapotranspiration, crop coefficients, and irrigation efficiencies (MGA 2019). The GSP recommended the implementation of a metering program to measure and document groundwater pumping for non-de minimis use to improve the accuracy of the Basin's numeric groundwater flow model and the MGA's ability to sustainably manage groundwater resources. Metering of pumping is particularly important in areas near the coast and near streams where pumping is most likely to influence seawater intrusion and the interconnection between surface waters and groundwater, which are two of the six Sustainability Indicators defined by SGMA.

The *Groundwater Extraction Metering Plan* (Metering Plan) presented herein describes how such a program will be implemented, including how to meter groundwater pumping and how to report the data to the MGA. An overview of the Metering Plan is presented in Appendix A.

The MGA has the authority under SGMA to require metering of non-de minimis groundwater use (as codified under California Water Code §10725.8). De minimis pumping, defined by SGMA as 2 acre-feet per year (AFY)¹ or less for domestic purposes, is exempt from metering requirements and is not required by this plan. For comparison, a typical household in Santa Cruz County uses approximately 0.35 AFY or 300 gallons per day (MGA 2019). A Groundwater Extraction Metering Policy (Metering Policy) requiring compliance with this Metering Plan, and providing additional details of the metering program, will be developed by the MGA beginning in early 2023.

1.1 Metering Objectives

The objective of this Metering Plan is to outline the procedures for metering non-de minimis, nonreporting groundwater pumping to enable proactive management of water resources and compliance with SGMA. The metering will provide the following benefits:

• Improve the understanding of the quantity and distribution of pumping in the Basin, which will facilitate refinement of the groundwater flow model and estimates of the sustainable yield of the Basin.

¹ One acre-foot equals about 326,000 gallons, or enough water to cover an acre of land (about the size of a football field) one foot deep.

- Supplement other data (e.g., groundwater level data, municipal pumping data) to track changing conditions and the SGMA Sustainability Indicators for the Basin, including:
 - decline of groundwater levels and groundwater storage
 - depletion of surface water flows that are interconnected with groundwater
 - degradation of groundwater quality, including sea water intrusion
- Help in assessing the performance of projects and management actions undertaken by the MGA throughout the GSP implementation period.

1.2 Applicability

Metering and reporting are required for existing and future wells that supply parcels with estimated or known groundwater use that meets one of the following criteria:

- More than 5 acre-feet per year (AFY)
- More than 2 AFY and located within 1,000 feet of surface water that is interconnected with groundwater, as defined in the GSP (MGA 2019), and as shown in Figure 1 below.
- More than 2 AFY and located where the groundwater elevation was less than 50 feet above mean sea level (msl) based on groundwater elevation contours from Fall 2005, as shown in the GSP (Figure 2-24, MGA 2019) and as shown in Figure 1 below.

Groundwater use for parcels with unmetered pumping are based on the indirect estimates prepared for the GSP (MGA 2019). For parcels with estimated groundwater use that meets the above criteria, metering and reporting is required for all wells that are on the parcel, serve the parcel, or are part of a group of parcels operated by the same entity (i.e., an operation, such as a farm). Continued metering and reporting are required if the groundwater use for a parcel or an operation as a whole meets the above criteria.

Figure 2 illustrates an example of multiple wells serving multiple parcels within an operation. In this example, if the total groundwater use for one parcel within the farm or for the entire farm meets the above criteria, all wells associated with the operation shall be metered and reported.



\\Oakland-01\data\GIS\SantaCruz_MGA\MGA\Project\2022-07\Fig01_MeteringPlanParcelSelection_LetterSize.mxd 11/16/2022 11:52:25 AM (Author: CBokman)





1.3 Well Registration

Upon adoption of the MGA Metering Policy, owners of parcels with expected non-de minimis, non-reporting groundwater use as defined in Section 1.2 of this Metering Plan shall register pumping wells with the MGA. Owners will register wells by submitting the registration form electronically to the MGA. An example of the registration form is provided as Appendix B with details for electronic submittal. The registration form shall be submitted within 180 days of adoption of the MGA Metering Policy.

Registration information includes owner and operator contact information, well location, the Santa Cruz County Assessor's Parcel Number (APN) for each parcel served by each well, well construction details, flowmeter details, and type of water use. Owners are encouraged to submit any available hydrogeologic data to help with groundwater management, including but not limited to water quality, water levels, boring logs, etc.

1.4 Flowmeters

A flowmeter shall be installed on each registered well within 180 days of adoption of the MGA Metering Policy. Existing flowmeters on wells may continue to be used if proper installation and calibration is verified by a third-party contractor².

1.4.1 Flowmeter Types

Wells owners may choose the type of flowmeter, but it must have an initial manufacturer warranted accuracy of a minimum of plus or minus 2%. Examples of the types of flowmeters that may be used include:

² MGA may review qualifications of third-party contractors used by well owners to install or calibrate flowmeters.

• **Propeller flowmeters** are commonly used in agriculture and municipal settings and have proven to be a reliable mechanism for long-term monitoring. These flowmeters use mechanical parts to measure flow rate and record total pumping volume. Flowmeters shall be sized based on expected flow rate and pipe diameter. Propeller meters require regular maintenance and calibration, as bearing wear can occur from the internal propeller and other physical damage. Flowmeter accuracy is commonly plus or minus 2%.



Figure 3. Example Propeller Type Flowmeter (Source: McCrometer 2022)

- **In-line ultrasonic flowmeters** measure flow rate by transmitting sound waves through water flowing in the pipe. These flowmeters have no moving parts and therefore require less frequent maintenance and are more reliable than propeller-type flowmeters. However, ultrasonic flowmeters are more expensive than propeller flowmeters. Flowmeter accuracy is commonly plus or minus 2% or better.
- Electromagnetic flowmeters measure flow rate using electrodes to measure changes to an applied voltage. Like ultrasonic meters, electromagnetic flowmeters have no moving parts, and therefore require less frequent maintenance and are more reliable. These meters also tend to cost more. Flowmeter accuracy is commonly plus or minus 2% or better.

1.4.2 Minimum Flowmeter Requirements

Flowmeters shall meet the following requirements:

- Minimum warranted accuracy of plus or minus 2%
- Calibrated by manufacturer prior to installation
- Display both an instantaneous flow rate and the total volume of water pumped
- Proper installation such that (1) the meter is upstream of all discharge connections and measures all flow from the well; (2) downstream and upstream runs of pipe meet manufacturer specifications; and (3) the discharge pipe is completely full of water when the well is pumping
- Calibration checks indicate a flow variance of less than 5%

1.4.3 Flowmeter Installation

Flowmeters shall be installed at easily accessible above-ground portions of the well according to the manufacturer's installation specification (e.g., correct upstream and downstream pipe length, correctly sized, etc.). A typical installation configuration is shown in Figure 4.

Installing a flowmeter typically requires 4 to 8 hours and may be performed by a licensed third-party contractor approved by the MGA. Alternatively, the owner may elect to install the flowmeter themselves. A third-party contractor must inspect flowmeters, whether new or existing, and provide documentation to the MGA including:

- Certification from the third-party contractor that the flowmeter is properly installed and meets the Metering Plan requirements
- Flowmeter details and photographs of the installation configuration using the electronic registration form (Appendix B)
- Certificate of calibration from the manufacturer for new flowmeters



Figure 4. Typical Installation Configuration

1.4.4 Routine Calibration

Proper calibration is important for ensuring data quality and meeting the objectives of the Metering Plan. Well owners are responsible for maintaining the flowmeter(s) in good working condition and shall provide documentation of flowmeter calibration to the MGA upon request. Routine calibration checks to verify the accuracy of the flowmeter (i.e., validation) may be conducted using a calibrated, temporary, clamp-on ultrasonic flowmeter to compare the instantaneous flow rate with the permanent flowmeter, or by another approved validation method performed by an appropriate third-party contractor. At the same time as routine calibration checks, third-party contractors may also test the pump motor efficiency to estimate the remaining useful life of the motor. Replacing motors when they become inefficient can save on electrical and maintenance costs.

If the difference in flow rate during the routine calibration check is greater than 5%, then the flowmeter shall be recalibrated or replaced. This typically involves removing the flowmeter and sending it to the manufacturer to have it factory calibrated. Calibration must be conducted in conformance with National Institute of Standards and Technology (NIST) Handbook 44, as referenced in California Code of Regulations, Title 4, Division 9 Weights and Measures Field Reference Manual (2018) Section 3.36 Water Meters.

1.4.5 Costs

Well owners are responsible for installation of flowmeters and ongoing maintenance costs.

2. **REPORTING**

The well owner, a person authorized by the owner, or a third-party contractor shall read the flowmeter for each registered well on approximately the last day of September each year³ and submit the reading electronically to the MGA on or before the tenth of October. An example form for data reporting is provided as Appendix C, which includes details on the electronic submittal process.

The following information shall be submitted to the MGA using the electronic form:

- **Contact information:** Name of the individual reading the flowmeter and an email address or phone number
- Meter reading: Date of flowmeter reading, flowmeter serial number (if available), totalizer reading with units and scale (e.g., acre-feet, gallons, cubic feet, hundreds of cubic feet, etc.), and a photograph of the meter face that legibly shows the totalizer numbers (when requested)
- Well identification number: Assigned by the MGA after registration

The owner or an authorized person shall submit a photograph of the flowmeter reading to the MGA when the flowmeter is installed and at the end of each water year thereafter (i.e., September 30). The MGA may conduct audits of flowmeters through a third-party contractor or through requests for photographs.

2.1 Data Confidentiality

The Metering Plan outlines a procedure that facilitates confidential collection and reporting of groundwater pumping data to the MGA. It is the intent of the MGA that the raw data will remain confidential pursuant to Government Code §6254(e). These data will be maintained for use by the MGA, and publicly available only as aggregate values by water use sector (i.e., Agriculture, Municipal, and Recreation) and the MGA will not release the raw data of any individual well owner.

³ SGMA authorizes a requirement of annual reporting of groundwater extraction. MGA encourages owners to voluntarily collect monthly groundwater extraction in order to more closely understand water demand patterns.

3. ENFORCEMENT AND PENALTIES

Compliance with this Metering Plan is required for all non-de minimis, non-reporting pumping wells in the Basin beginning 180 days from adoption of the MGA Metering Policy. To be in compliance, pumping wells must be registered with the MGA, flowmeters must be installed, calibrated, and documented with the MGA, and a minimum of annual flowmeter readings must be reported to the MGA. Metering is required immediately for new and replacement wells that meet the criteria described in Section 1.2 of this Metering Plan. The MGA may require metering and reporting of pumping from any well located in the Basin if it is uncertain whether it qualifies as a non-de minimis, non-reporting pumping well subject to the Metering Plan.

Owners who fail to comply with the Metering Plan or who provide inaccurate data to the MGA will be subject to penalties, including fines, as will be developed in the MGA Metering Policy.

4. PROCESS FOR APPEAL

The MGA recognizes that there will be cases that are not clearly defined by this Metering Plan or situations where special accommodations and considerations may be appropriate.

Appeals and requests for special accommodations will be handled as follows:

- Appeals or requests for special accommodations shall be emailed to the Basin Point of Contact at basinpoc@midcountygroundwater.org.
- The Basin Point of Contact will respond within 30 days to approve, deny, or request additional information.
- The applicant may appeal the Basin Point of Contact's decision. In which case, the final decision will be made by the Board of the MGA.

5. METERING PLAN UPDATES

The MGA will update the Metering Plan as needed in conjunction with five-year updates to the GSP.

6. **REFERENCES**

- California Department of Water Resources (DWR). 2016. Best Management Practices for the Sustainable Groundwater Management of Groundwater Monitoring Protocols, Standards, and Sites. California Department of Water Resources, Sustainable Groundwater Management Program. December.
- McCrometer. 2022. *McPropeller Flow Meters, Installation, Operation, and Maintenance Manual.* 24517-11. Revision 4.7. 11 July.
- Santa Cruz Mid-County Groundwater Agency (MGA). 2019. Groundwater Sustainability Plan. November.

APPENDIX A Metering Plan Overview

Steps	Details
Well Registration	Property owners with expected non-de minimis, non-reporting groundwater use shall register each well that supplies water to the parcel(s) by submitting a Well Registration Form (Appendix B ¹) to the MGA within 180 days of the adoption of the MGA Metering Policy.
Initial flowmeter installation and calibration check	Property owners that already have flowmeters installed shall have the flowmeter inspected and approved by a third-party contractor within 180 days of the adoption of the ordinance. The third-party contractor shall provide the following documentation to the MGA: certification that the flowmeter is properly installed and meets the Metering Plan requirements, results of a routine calibration check, photographs of the flowmeter and wellhead, and confirmation of the flowmeter details specified on the Well Registration Form (Appendix B). If the existing flowmeter does not meet the minimum requirements described in the Metering Plan, a new flowmeter shall be installed.
	Property owners that have either no flowmeter or a flowmeter that does not meet the minimum requirements shall have a new flowmeter installed. Owners that install a flowmeter themselves shall have it inspected and approved by a third-party contractor. After the flowmeter is installed, the third-party contractor shall provide the following documentation to the MGA: certification that the flowmeter is properly installed and meets the Metering Plan requirements, certificates of calibration from the manufacturer, photographs of the flowmeter and wellhead, and confirmation of the flowmeter details specified on the Well Registration Form (Appendix B).
Monthly flowmeter readings	Flowmeter readings shall be submitted to the MGA on or before the 10 th of October each year using the Water Use Reporting Form (Appendix C) starting the first month of October after the flowmeter is installed or approved.
Routine maintenance and calibration	Property owners are responsible for maintaining flowmeters in good working condition and shall provide documentation of flowmeter calibration or validation of flowmeter readings to the MGA upon request. If the flow rate variability exceeds 5%, then manufacturer recalibration or replacement will be required. Recalibration typically involves removing the flowmeter and sending it to the manufacturer to have it factory calibrated.
Costs	Well owners are responsible for installation of flowmeters and ongoing maintenance costs.
Appeals or special accommodations	Requests for appeals or special accommodations can be emailed to the Basin Point of Contact at <u>basinpoc@midcountygroundwater.org</u> .

¹ Appendix B is an example of the type of information that may be collected.

APPENDIX B Example Well Registration Form

Please fill out and submit the Well Registration Form on a smartphone or computer. Electronic forms can be accessed using the QR code or by typing the web address into an internet browser. Special accommodations can be requested by emailing the Basin Point of Contact at <u>basinpoc@midcountygroundwater.org</u>.

Add QR code to Survey123 form

Owner Information

Add link to Survey123 form

Contact Name(s)	
Business Name(s)	
Address(es)	
City/State/Zip	
Phone Number(s)	
Email Address(es)	

Operator Information (if different from above)

Contact Name(s)				
Business Name(s)				
Address(es)				
City/State/Zip				
Phone Number(s).				
Email Address				
Well Information				
Owner's Well Name/Nu	mber			
Assessor's Parcel Numb	er(s) (APN) of well loo	cation		
Assessor's Parcel Numb	er(s) (APN) served by	well		
Well Location/Address				
Public Land Survey Loc	ation; Township	Range	Section	
GPS Coordinates; Latitu	de	Longitu	ıde	
State Well Number (SW	N)			

Additional Well Information

County Well Permit No.	
Date Drilled	
Well Depth	_feet
Casing Diameter	_inches
Depth to Top and Bottom of Perfora	tions or Screenfeet below ground surface
Motor Type (select one): Submersible	or Turbine Motor/Enginehorsepower (HP)
Flowmeter Information	
Existing Water Flowmeter (select on	e): Yes or No
Manufacturer of Water Flowmeter	
Water Flowmeter Size	_ inches
Serial Number of Water Flowmeter	
Water Flowmeter Units and Scale (e.	g., acre-feet, gallons, million gallons, cubic feet, hundreds of cubic feet. etc.
Electric Meter Number	
Hydrogeologic Data (If any	of the below data are available, check box and

E please provide documentation.)

- Groundwater Quality Data Available
- \square Groundwater Level Data Available
- \square Static Groundwater Levels Available
- \square Pumping Groundwater Levels Available
- Aquifer Test Data Available
- Geophysical (E-log) Available

Well Water Use Type

Agricultural/Irrigation (list number of acres and crop categories) Stock Watering (number and type of animals) Domestic (number of persons served) Municipal or Industrial Other (describe)

APPENDIX C Example Groundwater Use Reporting Form

Please fill out and submit the Groundwater Use Reporting Form on a smartphone or computer. Electronic forms can be accessed using the QR code or by typing the web address into an internet browser. Special accommodations may be requested by emailing the Basin Point of Contact at <u>basinpoc@midcountygroundwater.org</u>.

Add QR code to Survey123 form

1. Reporting Person

Name _____

Phone Number

Email Address

2. Well Information

Well ID (as assigned by the MGA)

3. Flowmeter Reading

Date of Reading

Totalizer Reading (remember to multiply by scale stated on meter face. e.g., x100)_____

Units (e.g, gallons, acre-feet, cubic feet, etc.)_____

Meter Serial Number (*if available*)

4. Photo Upload

Photographs of flowmeter readings are required when the flowmeter is installed and at the end of each water year thereafter (i.e., September 30),

Add link to Survey123 form

December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 6.1

Title: Treasurer's Report

Attachments:

1. Treasurer's Report for the Period Ending November 30, 2022

Attached is the Treasurer's Report for September through November 2022. These reports contain three sections:

- Statement of Changes in Revenues, Expenses and Net Position
 - This interim financial statement provides information on the revenue that has been invoiced to the member agencies and the expenses that have been recorded as of the period ending date.
- Statement of Net Position
 - This interim financial statement details the cash balance at Wells Fargo Bank, the membership revenue still owed through accounts receivable, if any, prepaid expenses such as insurance, and the resulting net income as reported on the Statement of Changes in Revenues, Expenses and Net Position from the preceding page.
- Warrants
 - The list of warrants reflects all payments made by the MGA, either by check or electronic means, for the period covered by the Treasurer's Report.

The Treasurer's Report will be provided at each board meeting according to statutory requirement and to promote transparency of the agency's financial transactions.

Recommended Board Action:

1. Informational, no action necessary.

Submitted by: Leslie Strohm Treasurer Santa Cruz Mid-County Groundwater Agency

Treasurer's Report

Santa Cruz Mid-County Groundwater Agency For the period ended November 30, 2022



Prepared by Leslie Strohm, Treasurer

Prepared on December 5, 2022

97 of 158

Statement of Revenues, Expenses and Changes in Net Position

September - November, 2022

	Total
INCOME	
Total Income	
GROSS PROFIT	0.00
EXPENSES	
5100 Groundwater Management Services	1,295.00
5110 Grndwtr Mgmt - Groundwater Monitoring	21,402.64
5210 Rain & Stream Gage Services	6,373.95
5315 Office Services	143.99
5340 Computer Services	275.96
5355 Insurance	843.75
5415 Outreach Services	46.00
5510 GSP Consulting Services	2,257.50
5515 Audit & Accounting Services	1,500.00
5520 Legal Services	2,500.00
Total Expenses	36,638.79
NET OPERATING INCOME	-36,638.79
NET INCOME	\$ -36,638.79

Statement of Net Position

As of November 30, 2022

	Total
ASSETS	
Current Assets	
Bank Accounts	
1100 Wells Fargo Business Checking	1,954,119.44
Total Bank Accounts	1,954,119.44
Accounts Receivable	
1220 Accounts Receivable - Grants	246,319.64
Total Accounts Receivable	246,319.64
Other Current Assets	
1400 Prepaid Expenses	281.25
Total Other Current Assets	281.25
Total Current Assets	2,200,720.33
TOTAL ASSETS	\$2,200,720.33
LIABILITIES AND EQUITY	
Liabilities	
Current Liabilities	
Accounts Payable	
2100 Accounts Payable	18,586.83
Total Accounts Payable	18,586.83
Total Current Liabilities	18,586.83
Total Liabilities	18,586.83
Equity	
3100 Retained Earnings	1,919,451.45
Net Income	262,682.05
Total Equity	2,182,133.50
TOTAL LIABILITIES AND EQUITY	\$2,200,720.33

Warrants

September - November, 2022

Date	Transaction Type	Num	Name	Memo/Description	Clr	Amount
Bill Payment (C	heck)					
11/09/2022	Bill Payment (Check)	10302	Errol L Montgomery & Associates Inc	SGMA Support, Monitoring Network Improvements, Data Coordination, GSP Annual Report		-2,987.50 -2,987.50
11/09/2022	Bill Payment (Check)	10303	Soquel Creek Water District (2)	Mailchimp, Quickbooks, Annual Audit Services		-1,500.00 -1,500.00
11/09/2022	Bill Payment (Check)	10304	Trout Unlimited Inc	Stream Monitoring		-6,373.95 -6,373.95
10/14/2022	Bill Payment (Check)	10298	B ACWA/JPIA	Member# S073	R	-1,125.00 -1,125.00
10/14/2022	Bill Payment (Check)	10299	Errol L Montgomery & Associates Inc	SGMA Support, Monitoring Network Improvements, Data Coordination, GSP Annual Report	R	-1.697.50
	· 2.,					-1,697.50

Date	Transaction Type	Num	Name	Memo/Description	Clr	Amount
10/14/2022	Bill Payment (Check)	10300	Geosyntec Consultants, Inc	Development of Groundwater Metering Program	R	-4,988.81 -4,988.81
10/14/2022	Bill Payment (Check)	10301	Soquel Creek Water District (2)	Mailchimp, Quickbooks, and Domain Registration	R	-213.96 -213.96
09/21/2022	Bill Payment (Check)	10297	County of Santa Cruz Dept of Community Development and Infrastructure	Aptos Village County Parks Right of Entry	R	-1,000.00 -1,000.00
09/12/2022	Bill Payment (Check)	10293	Errol L Montgomery & Associates Inc	SGMA support, monitoring network improvements, data coordination, GSP annual report	R	-3,080.00 -3,080.00
09/12/2022	Bill Payment (Check)	10294	Geosyntec Consultants, Inc	Development of groundwater metering program	R	-4,068.24 -4,068.24
09/12/2022	Bill Payment (Check)	10295	Regional Water Management Foundation	Agency Administration and GSP support	R	-98,517.85 -98,517.85

Date	Transaction Type	Num	Name	Memo/Description	Clr	Amount
09/12/2022	Bill Payment (Check)	10296	Soquel Creek Water District (2)	Mailchimp, Quickbooks, Annual Audit Services	R	-1,603.00
						1,000.00
Expense						
10/05/2022	Expense	US003Oq5Uw	Google - Online Payments	G Suite Subscription	R	-72.00
				Google Payment - G Suit		72.00
09/06/2022	Expense	US003O4Pcx	Google - Online Payments	G Suite Subscription	R	-71.99
				Google Payment - G Suit		71.99

December 15, 2022

Subject: Agenda Item 6.2

Title: Staff Reports (Oral Reports) with supporting materials in Packet

Item	Торіс	Format	Materials in Board Packet
6.2.1	Letter from National Oceanic and Atmospheric	Oral report	Yes
	Administration (NOAA)		
	Service to County of Santa		
	Cruz dated 11/4/2022		
6.2.2	Informational update from	Oral Report	Yes; 1) Report on Economic
	City of Santa Cruz Water		Impacts of Water Supply
	Department		Curtailments (11/1/2022)
			2) Project Concepts 1 – 4
			Summaries

Agenda Item 6.2.1



UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration NATIONAL MARINE FISHERIES SERVICE West Coast Region 777 Sonoma Avenue, Room 325 Santa Rosa, California 95404-4731

November 4, 2022

Chairman Manu Koenig Santa Cruz County Board of Supervisors 701 Ocean Street, Room 500 Santa Cruz, California 95060 (BoardOfSupervisors@santacruzcounty.us)

Re: Streamflow Depletion Impacts arising from Permitted Groundwater Extraction in Santa Cruz County, California

Dear Chairman Koenig:

NOAA's National Marine Fisheries Service (NMFS) is the federal agency responsible for managing, conserving, and protecting living marine resources in inland, coastal, and offshore waters of the United States. We derive our mandates from numerous statutes, including the Federal Endangered Species Act (ESA). The purpose of the ESA is to conserve threatened and endangered species and their ecosystems.

Surface water and groundwater are hydraulically linked throughout much of Santa Cruz County (Santa Cruz Mid-County Groundwater Agency 2019; Santa Margarita Groundwater Sustainability Agency 2021), and this linkage is critically important in maintaining summer and early fall instream habitat for ESA-listed Central California Coast (CCC) coho salmon (Oncorhynchus kisutch), CCC steelhead (Oncorhynchus mykiss), and South-Central California Coast (S-CCC) steelhead. Where the groundwater aquifer supplements streamflow, the influx of cold, clean water is critically important for maintaining water quality (e.g., temperature and dissolved oxygen) and flow volume. Pumping water from these aquifer-stream complexes has the potential to degrade salmon and steelhead habitat by lowering groundwater levels, altering the hyporheic flow between the underlying aquifer and stream. Recent analysis (e.g., Santa Margarita Groundwater Sustainability Agency 2021) suggests significant streamflow depletion caused by groundwater extraction is currently occurring within Santa Cruz County, and we suspect this depletion is impacting ESA-listed salmonids and their habitat. Yet, Santa Cruz County continues to ministerially permit¹ well construction and groundwater extraction without analysis or consideration of potential impacts the resulting groundwater pumping may have on ESA-listed salmon and steelhead, and their habitat.

Furthermore, a recent California Court of Appeal decision held that the public trust doctrine must be considered—and public trust resources protected whenever feasible—in any decision governing groundwater withdrawals hydrologically connected to public trust surface waters. As noted above, CCC and S-CCC steelhead, and CCC coho salmon, listed as threatened and endangered (respectively) under the ESA, inhabit many of the navigable waterways (e.g., San





Lorenzo River, Soquel Creek, Aptos Creek, Pajaro River) overlying the County, and should clearly be considered a public trust resource. We reiterate our view that groundwater development/extraction is likely currently impacting salmon and steelhead migration, rearing, and spawning habitat, and thus harming public trust resources. We urge the County to enact a discretionary permitting process for well construction and groundwater extraction within Santa Cruz County that appropriately considers and minimizes these impacts.

We look forward to working with Santa Cruz County and other interested stakeholders in developing an appropriate well permitting process that adequately considers streamflow depletion impacts to ESA-listed salmonids. If you have any questions or concerns regarding this letter, please contact Rick Rogers at 707-578-8552, or <u>rick.rogers@noaa.gov</u>.

Sincerely,

a. Ingham

Amanda Ingham Central Coast Branch Supervisor North Central Coast Office

 cc: Craig Weightman, CDFW, Region 3 (<u>Craig.Weightman@wildlife.ca.gov</u>) Jessie Maxfield, CDFW Region 3 (<u>Jessica.Maxfield@wildlife.ca.gov</u>) David Hines, CDFW Region 3 (David.Hines@wildlife.ca.gov) Sean Cochran, CDFW Region 3 (Sean.Cochran@wildlife.ca.gov) James Bishop, Central Coast RWQCB (<u>James.Bishop@waterboards.ca.gov</u>) Dr. Marilyn Underwood, Santa Cruz County Director of Environmental Health (Marilyn.Underwood@santacruzcounty.us) NMFS File #: 151416WCR2022SR00205

References

Santa Cruz Mid-County Groundwater Agency. 2019. Santa Cruz Mid-County Groundwater Basin Groundwater Sustainability Plan. Copy available at: https://www.midcountygroundwater.org/sustainability-plan

Santa Margarita Groundwater Sustainability Agency. 2021. Santa Margarita Basin Groundwater Sustainability Plan. Copy available at: https://www.smgwa.org/ GroundwaterSustainabilityPlan Note: this item is included in the MGA Board Meeting Packet (12/15/22) as an informational update regarding work conducted by the City of Santa Cruz Water Department.

The Economic Impacts of Water Supply Curtailments as May Need to be Implemented by the Santa Cruz Water Department

November 1, 2022

Prepared for: City of Santa Cruz Water Department

Prepared by:

Robert Raucher Raucher LLC

Carolyn Wagner CW Research and Consulting

Colleen Donovan Social Science Strategies LLC

Under Subcontract to Kennedy Jenks Consultants

Table of Contents

Executive Summaryi
Background1
Objective1
Overview of Curtailment Policies2
Direct Costs Borne by SCWD
Lost revenues
Administrative costs
Methodology for Economic Impact Analysis6
Focusing on Water-Dependent Business Sectors
Direct Economic Impact Scenarios by Business Sector
Nursery, landscape, and garden8
Restaurants, manufacturing, and car washes8
Tourism and recreation9
Golf courses
UCSC
Direct Economic Impacts on Household Customers10
Direct Economic Impacts on Household Customers10 Indirect and Induced Economic Impacts (Applying the IMPLAN Model)12
Direct Economic Impacts on Household Customers
Direct Economic Impacts on Household Customers. 10 Indirect and Induced Economic Impacts (Applying the IMPLAN Model) 12 Economic Impact at County level 12 <i>Key Findings</i> 13 High-Level Results 14 Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers 17 Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers 18
Direct Economic Impacts on Household Customers.10Indirect and Induced Economic Impacts (Applying the IMPLAN Model)12Economic Impact at County level12Key Findings13High-Level Results14Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers17Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers18Key Results for Stage 5 Curtailments on Businesses and Other Non-Residential Customers19
Direct Economic Impacts on Household Customers.10Indirect and Induced Economic Impacts (Applying the IMPLAN Model)12Economic Impact at County level12 <i>Key Findings</i> 13High-Level Results14Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers17Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers18Key Results for Stage 5 Curtailments on Businesses and Other Non-Residential Customers19Caveats and Limitations19
Direct Economic Impacts on Household Customers 10 Indirect and Induced Economic Impacts (Applying the IMPLAN Model) 12 Economic Impact at County level 12 <i>Key Findings</i> 13 High-Level Results 14 Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers 17 Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers 18 Key Results for Stage 5 Curtailments on Businesses and Other Non-Residential Customers 19 Caveats and Limitations 19 Business Sectors Included or Excluded 19
Direct Economic Impacts on Household Customers10Indirect and Induced Economic Impacts (Applying the IMPLAN Model)12Economic Impact at County level12 <i>Key Findings</i> 13High-Level Results14Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers17Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers18Key Results for Stage 5 Curtailments on Businesses and Other Non-Residential Customers19Caveats and Limitations19Business Sectors Included or Excluded19Business Recovery after Peak Season20
Direct Economic Impacts on Household Customers 10 Indirect and Induced Economic Impacts (Applying the IMPLAN Model) 12 Economic Impact at County level 12 Key Findings 13 High-Level Results 14 Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers 17 Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers 18 Key Results for Stage 5 Curtailments on Businesses and Other Non-Residential Customers 19 Caveats and Limitations 19 Business Sectors Included or Excluded 19 Business Recovery after Peak Season 20 New Businesses Attracted to the City 20
Direct Economic Impacts on Household Customers. 10 Indirect and Induced Economic Impacts (Applying the IMPLAN Model) 12 Economic Impact at County level 12 Key Findings 13 High-Level Results 14 Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers 17 Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers 19 Caveats and Limitations 19 Business Sectors Included or Excluded 19 Business Recovery after Peak Season 20 New Businesses Attracted to the City 20 Impacts from Penalty-Based Reductions in Household Disposable Income 20

Executive Summary

The City of Santa Cruz is vulnerable to droughts, which are projected to become more frequent and severe under continuing climate change. Santa Cruz needs to supplement its water supply, otherwise demand curtailments are the only tool available to deal with the system's vulnerability to drought (whether the city grows or not).

The water supply augmentation options available to the City are complex and expensive, raising the question about how much it may be worth to pursue supplemental water supply options. Examining the economic cost of potential water supply curtailments provides one yardstick against which the adverse impacts of shortages may be compared to the expense of potential water supply enhancement options.

This Technical Memorandum (TM) provides findings from our analysis of adverse economic impacts associated with potential future water supply curtailments in Santa Cruz. Also presented are descriptions of the Santa Cruz Water Department (SCWD) plan for addressing water shortages and the methodology and data applied to our analysis.

Background and Objective

Water supply curtailments can be undesirable for many reasons, including their adverse impact on the local economy. SCWD's 2021 Water Shortage Contingency Plan (WSCP) details five stages of curtailment, with Stage 1 aiming to reduce peak season use by 10%, Stage 2 targeting an overall 20% reduction, etc. (SCWD, 2021). This TM summarizes the projected adverse economic impacts arising from a potential need to implement Stages 3, 4, and 5 (with 30%, 40%, and 50% targeted reductions in overall peak season water use, respectively). Such curtailment stages are severe, yet they may be necessary given the water system's vulnerability to drought conditions that may worsen under continuing climate change.

The economic analysis represents a "what if" assessment, intended to inform and support City of Santa Cruz deliberations on potential water supply investments aimed at avoiding the need to impose severe water curtailment stages. To the extent that water supply enhancement options reduce the likelihood and severity of future curtailments, the associated reduction in adverse community economic impacts represent an important portion of the *benefits* provided by augmenting the City's water supply. These benefits – estimated here as *avoided economic costs* borne by the community – can then be compared to the expense of the associated water supply augmentation options.

Methods and Approach

The methodology applies a standard "regional economic impact analysis" approach and modeling tool (IMPLAN) to assess curtailment impacts on the City's economy, and on Santa Cruz County as a whole. Text Box A provides an overview of the modeling approach, and a glossary defining key terms is provided at the end of this Summary.

The methodology focuses on water-dependent local businesses, the University of California at Santa Cruz (UCSC), golf courses, and the North Coast agriculture sector. These are business sectors for which access to a relatively large supply of water is essential to the ability to provide
their goods and services (i.e., where reduced access to water will adversely impact the level of business operation or, perhaps, lead to business closure).

Sector-specific water supply cutbacks, per the SCWD's WSCP, were translated into anticipated ranges of direct impacts on sector economic output (e.g., net revenues), which are then input for modeled projections of direct, indirect, and induced impacts on regional economic output, labor income, jobs, and local tax revenues. Conservative assumptions were applied to avoid over-stating the estimated impacts (e.g., impacts were limited to a subset of business types).

Text Box A: Regional Economic Impacts and the IMPLAN Model

IMPLAN is an economic input-output (I-O) model, originally developed by the federal government. The model contains information on the relationships within an economy, both between businesses, and between businesses and final consumers. IMPLAN predicts changes in overall economic activity resulting from a flow of money into and out of the local economy (e.g., visitor spending and the subsequent ripple of local "multiplier" effects). Widely used by academics and the public and private sectors, IMPLAN is generally accepted as the standard for economic I-O analysis. Additional detail is provided in the full report.

High-Level Findings

An economic impact analysis is, by its nature, an imprecise exercise in which numerous uncertainties exist and many key assumptions need to be made. Nonetheless, the estimates developed are likely to be conservative, and are consistent with findings derived from investigations of the economic impacts of water supply shortages in other communities.¹ The economic analysis developed a considerable amount of empirical findings. In this summary, we focus on high-level results. Additional detailed empirical information is provided in the full report.

Table ES1 reveals the economic impact on the City, should the SCWD need to implement Stage 3, 4, or 5 level water use curtailments. For example, at Stage 3, City-wide economic output (i.e., the value of industry production within the region) is projected to decline by \$114 million to \$243 million per year, reflecting a decline of 1.1% to 2.4% of total City economic output in a normal year. Also, between 1,146 and 2,428 jobs are estimated to be lost, and City tax revenues decline by \$2.1 million to \$5.4 million.

¹ For example, an analysis of the economic impacts of water supply shortages for the East Bay Municipal Utility District developed estimates showing how lost economic output grows rapidly if curtailments rise above a 15% supply shortfall. The estimated loss of output was nearly \$20 billion – or more than \$2 million per MG of shortage – if a 15% shortage were to grow to a 25% curtailment level (estimates derived from M-Cubed, 2008a and 2008b; updated to 2022 dollars).

Metric (Losses)	Total impact at Stage 3	Total impact at Stage 4	Total impact at Stage 5
Output lost (\$M)	\$114.4 – \$242.9	\$324.3 – \$505.3	\$578.5 – \$789.9
Labor income lost (\$M)	\$53.8 – \$109.1	\$141.0 – \$218.6	\$245.7 – \$337.3
Value added lost (\$M)	\$68.6 – \$144.8	\$192.2 – \$299.3	\$341.6 – \$467.8
Employment (# of jobs lost)	1,146 - 2,428	3,236 – 5,066	5,752 – 7,902
Tax revenues lost: City of Santa Cruz*(\$M)	\$2.1 - \$5.4	\$8.0 - \$12.7	\$15.5 – \$21.1
Tax revenues lost: County (\$M)	\$0.7 - \$1.8	\$2.7 – \$4.3	\$5.3 – \$7.1
Tax revenues lost: State (\$M)	\$3.0 - \$7.5	\$10.9 – \$17.1	\$20.6 – \$28.0
Tax revenues lost: Federal (\$M)	48.4 – \$17.5	\$23.0 - \$35.8	\$40.6 – \$55.6
Total Tax Revenues Lost: Total (\$M)	\$14.1 – \$32.2	\$44.6 – \$69.8	\$82.0 - \$111.8

Table ES1. City-level negative economic impacts (losses) from select business and other non-residential curtailments

The estimated economic losses also can be interpreted relative to the amount of added water supply that would be needed to avoid a given level of curtailment [e.g., as a cost per million gallons (MG), or cost per acre-foot, of shortage]. The resulting "cost" of not having sufficient water can then be used as a benchmark against which to compare the expense of investments needed to secure that amount of water.

Table 2 summarizes the estimated change in overall impact on City economic output from moving to increasingly more restrictive curtailment stages on businesses and other non-residential sectors that are highly water dependent. Also shown is the implied economic cost per volume of water targeted overall for peak season use reductions.

For example, moving from Stage 3 to Stage 4 reduces estimated annual economic output within the City by between approximately \$210 million and \$262 million. This amounts to between \$1.5 million and \$1.9 million of lost economic output per MG of reduced water availability (based on 136 MG of additional water required to avoid moving from one curtailment stage to the next more severe curtailment stage for one water year peak period).²

Another way of interpreting this finding is that if enough additional water supply was made available such that the City could avoid applying Stage 4 restrictions and instead implement the less restrictive Stage 3 limits (e.g., adding the equivalent of 10% of normal peak season water usage, i.e., 136 MG), then the City would gain an estimated additional economic output of \$210 million to \$262 million. This translates to \$1.5 million to \$1.9 million of added economic output per MG added (compared to the water supply augmentation options currently being evaluated

² The 136 MG figure represents 10 % of total average peak season consumption for the 2016-2018 three-year base period SCWD uses for planning.

by the City, which are each expected to cost less than \$30,000 per MG produced). This is one way of viewing the value added of developing an additional source of available water supply.

Impact	Change in output (\$M)	\$/MG** (\$M)	\$/AF (\$M)
Stage 2* to 3	\$114.4 – \$242.9	\$0.8 - \$1.8	\$0.3 – \$0.6
Stage 3 to 4	\$209.9 – \$262.4	\$1.5 – \$1.9	\$0.5 – \$0.6
Stage 4 to 5	\$254.2 – \$284.6	\$1.9 – \$2.1	\$0.6 - \$0.7

Table ES2. City-only incremental impacts from business curtailments (select industries only)

* Assumes *de minimus* economic impact at Stage 2 for businesses

** Applies 136 MG need to meet each Stage's 10% incremental reduction in total peak season demand

The results above are considered conservative as they do not include all the business types that are likely to be adversely impacted by curtailments. Also not included in the results above are the impacts from reduced household disposable income (arising from excess use penalties and drought cost recovery fees). Those additional results are provided in the full report.

Also provided in the full report are the results from an analysis of how the economic impacts arising in the City spill over to the broader county. In brief, county-wide impacts add approximately 10% more impact than experienced in the City alone.

Glossary of Key Economic Terms Used in this Report

Direct impacts are the initial changes in business revenues, such as the increased receipts from enhanced tourism, or a decrease in output when limited water availability constrains businesses operations. For example, *direct expenditures* include money tourists spend while visiting the area on food, lodging, and retail purchases.

Indirect impacts: Local businesses that benefit from direct spending then, in turn, spend additional (or reduced) revenues on goods and services that they need to operate their businesses. These are termed *indirect expenditures*.

Induced impacts: Direct and indirect spending generates employment in the local region, creating additional (or reduced) income for households, which generates further changes in local spending known as *induced expenditures*.

Economic Output refers to the value of industry production within the region. For manufacturers, output = sales plus/minus change in inventory; for service sector,

output = production = sales; for retail and wholesale trade, output = gross margin (not gross sales).

Value Added refers to the difference between an Industry's or establishment's total Output and the cost of its Intermediate Inputs; it is a measure of the contribution to GDP.

Labor Income is defined as all forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.

Employment includes an industry-specific mix of full-time, part-time, and seasonal employment.

Tax revenues accrued by various levels of government authorities, focusing here on local (i.e., city and county) governments and sub-county special districts.

Source: https://support.implan.com/hc/en-us/articles/360044986593-Glossary

The Economic Impacts of Water Supply Curtailments as May Need to be Implemented by the Santa Cruz Water Department

Background

The Santa Cruz Water Department (SCWD, Department) is evaluating several options to enhance the reliability of its water supply in the face of the system's vulnerability to drought and other risks. Shortfalls in supply relative to the community's already hardened demand are anticipated to become more frequent and more severe as the climate continues to change. Santa Cruz needs to supplement its water supply, otherwise demand curtailments are the only tool available to deal with the system's vulnerability to drought (whether the city grows or not).

This Technical Memorandum (TM) examines the economic cost to the City and the served community associated with potential future water supply shortfalls. To the extent that water supply enhancement options reduce the likelihood and magnitude of curtailments, the associated reduction in adverse community economic impacts represent a key portion of the benefits provided by the supply enhancements. These benefits (estimated as avoided economic costs borne by the community) can then be compared to the expense of the associated water supply enhancement alternatives.

Water supply shortages and resulting curtailments can have many adverse impacts on a community, including (but not limited to) negative economic impacts. As water-dependent businesses scale back operations (or close), there are resulting losses in regional output and business revenues, jobs, incomes, and local tax receipts. Many local households also suffer economic losses as lower incomes, drought-adjusted water rates, and excess use penalties reduce their disposable income and thus impact purchases of local goods and services.

This TM provides a summary of the findings of a "regional economic impact analysis" of potential water use curtailments that future conditions may necessitate being implemented by SCWD. SCWD's 2021 Water Shortage Contingency Plan (WSCP) details five stages of curtailment, with Stage 1 aiming to reduce peak season use by 10%, Stage 2 targeting an overall 20% reduction, etc. (SCWD, 2021). This TM summarizes the projected adverse economic impacts arising from a potential need to implement Stages 3, 4, and 5 (with 30%, 40%, and 50% reductions in overall peak season water use, respectively).

Objective

This economic analysis represents a "what if" assessment, intended to inform City of Santa Cruz deliberations on potential water supply investments aimed at avoiding the need to impose severe water curtailment stages. The adverse economic consequences reported here – as well as the additional important community consequences of water supply curtailments, such as the loss of green spaces and their benefits – are a yardstick intended to help the City of Santa Cruz assess the beneficial value of its potential water supply augmentation options.

The SCWD is evaluating several options to enhance the reliability of its water supply in the face of the system's vulnerability to climate change and other risks. Shortfalls in supply relative to the community's already "hardened demand" are anticipated to become more frequent and more severe as the climate continues to change.

Options to enhance the reliability and security of the community's water supply are relatively expensive and complex. However, water supply shortfalls are also costly in many ways, and the potential need to implement severe curtailment stages of the WSCP is the only response available unless the City augments its current water supply portfolio.

To the extent that water supply enhancement options reduce the likelihood and severity of curtailments, the associated reduction in adverse community economic impacts represent an important portion of the *benefits* provided by augmenting the City's water supply. These benefits – estimated here as *avoided economic costs* borne by the community – can then be compared to the expense of the associated water supply augmentation options.

Overview of Curtailment Policies

SCWD has developed a detailed set of plans for how it will address various potential levels of water supply shortages, as detailed in its WSCP [located in Appendix O in the *City of Santa Cruz 2020 Urban Water Management Plan* (SCWD, 2021)]. There are several curtailment stages that may be implemented, depending on how much peak season water use needs to be scaled back [from a baseline of approximately 1,358 million gallons (MG)].³

The WSCP was developed to comply with state-imposed requirements, and the curtailment stages are intended to ensure that the system – given its current supply portfolio – does not run out of water when a drought or other event (e.g., wildfire) reduces its available supply. Absent augmentation of the current water supply, these curtailments would be the only mechanism available to keep water flowing to the City's taps. However, the Department's staff does not view the curtailments as being realistically attainable as a water shortage management strategy, and there is concern that meeting the targeted allocations would put public health and safety at risk. And, as discussed below, even attaining compliance with the least restrictive curtailment levels – Stages 1 and 2 – will be very challenging given the level of water use efficiency and conservation that has already been adopted throughout the community.

The distribution of peak season water use across customer classes is shown in Figure 1. Each curtailment stage calls for an overall reduction of water use in 10% increments (e.g., Stages 1 and 2 aim for a 10% and 20% reduction in overall city-wide peak season water use, respectively). Stages 3, 4, and 5 present increasingly drastic cutback targets of 30%, 40%, and 50%, respectively. The amount of water targeted to be saved at each Stage is approximately 136 MG, based on 10% incremental cuts from total peak season demand.

³ Peak water use season is defined as the six-month period starting May 1 and ending October 31. These are also the months in which there typically is little rainfall, relatively higher (summer) temperatures and, hence, generally higher water demands.





Within each stage, the target allocation of cutbacks varies across different SCWD customer classes, as shown in Table 1. For example, at Stage 3, the overall 30% demand reduction target entails a targeted 32% water use reduction from single family residential households, 15% from business customers, and 55% from golf courses. Overall, the priority is on preserving public health and safety by ensuring adequate allocations meet essential human needs (e.g., drinking, cooking, cleaning, and sanitation) and fire protection. The largest cuts reflect a focus on outdoor irrigation.

The relatively moderate target reductions for businesses reflect a desire to support essential economic activity (recognizing that for many businesses, water use is primarily for on-site kitchen and restroom facilities and, therefore, a public health and safety use). Under Stages 1 and 2, business impacts are expected to be relatively modest, with much of the water-conserving burden placed on outdoor uses. Nonetheless, households may struggle to live within their Stage 1 and 2 allocations (as evident from recent Stage 1 experience, discussed below). Stage 2 curtailments may not be realistically attainable, and impacts are likely to be very onerous at Stages 3 and higher.

Customer class	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Single family residential	11%	21%	32%	42%	49%
Multi-family residential	8%	16%	24%	32%	41%
Business	5%	10%	15%	21%	40%
Golf courses	18%	36%	55%	74%	90%
UCSC	9%	19%	28%	38%	45%
North Coast agriculture	5%	10%	15%	25%	70%
Landscape irrigation	25%	50%	75%	100%	100%

 Table 1. Customer class reduction goals at each curtailment stage

Achieving even the Stage 1 and 2 targets are challenging given the extent to which the City's water demands have already been "hardened" (i.e., demand has already been scaled back due to extensive and successful conservation and related demand management efforts by the SCWD and the Santa Cruz community). The City of Santa Cruz already has one of the lowest residential per capita water use outcomes in California, at 45 gallons per person per day as of 2021 for indoor <u>and</u> outdoor use combined, and 35 gallons per capita per day (GPCD) for indoor use alone (City of Santa Cruz, 2021). As an indicator of water efficiency embraced by the Santa Cruz community, note that the City's per capita water use is well below the state's current goal is 55 GPCD GPCD for indoor use only (and even less than the future state standard which is slated to move to 42 GPCD by 2030 for indoor use).⁴

The first use of the updated WSCP was in 2021, when SCWD declared a water shortage and implemented Stage 1 water use curtailments. The updated plan replaced the 2009 WSCP and was revised to reflect substantial reductions in customer water use, resulting in a plan with stages with considerably more negative impacts to all classes of customers than the 2009 plan.

During the 2021 implementation of Stage 1 approximately 30% of households exceeded their Stage 1 allotment, revealing how inelastic water demand may be in the City, and suggesting how challenging meeting future curtailment targets may be. The challenge is likely to be even greater if circumstances require implementing curtailments beyond Stages 1 and 2 (e.g., by Stage 3, the City is looking to reduce household water use by nearly three times as much as the cutbacks imposed under Stage 1).

In future years, when climate change-driven droughts may be more severe and/or of longer (multi-year) duration, without supply augmentation the potential need to implement more restrictive curtailment stages will create even greater challenges. Hence the desire to augment the City's water supply portfolio with additional reliable water sources through, for example, more storage via groundwater augmentation.

⁴ Per the Senate Bill passed and signed into law on September 28, 2022, by Governor Newsom.

Direct Costs Borne by SCWD

There are two categories of costs borne by the SCWD: (1) lost revenue from decreased water sales and (2) administrative costs to implement the water curtailments.

Lost revenues

SCWD's rates are structured to generate 90% of needed revenues through the sale of water that customers pay for according to the number of billing "units" used (1 unit = 748 gallons or one hundred cubic feet CCF). To offset the costs of lost revenues from decreased water sales during curtailments, SCWD imposes and collects drought cost recovery fees from its customers. These fees will be collected as a monthly fixed fee based on meter size for an entire fiscal year (SCWD, 2021). The size of the fixed fee increases as the curtailment stage increases. This offset is assumed in our analysis to result in no change to an individual customer's total annual water bill (i.e., that customers will pay the same amount for less water). However, the fixed rates are based on meter size and some customers may end up paying more than their customary use bills (especially the low volume users). These higher total water bill costs are not included in our analysis, though they could have a negative impact on household and business incomes and, thus, adversely impact the local economy.

Administrative costs

Implementing water curtailments will result in administrative costs for the SCWD to pay for additional staff, equipment, etc. The SCWD anticipates using reserve funds to pay for these added administrative costs and then replenishing reserves over time from ongoing rate revenues. Table 2 summarizes the total estimated costs at each curtailment stage, revealing how the cost rises at an increasing rate as the Department progresses to higher curtailment stages (e.g., added administrative cost at Stage 3 are nearly ten times the added cost at Stage 1). Although there might be a small boost to the local economy associated with SCWD staff growth, we do not factor these costs into this analysis as, ultimately, the expense will be borne by SCWD customers.

Water curtailment stage	Additional administrative costs
1	\$146,500
2	\$704,900
3	\$1,362,100
4	\$1,759,200
5	\$2,122,400

Table 2. Estimated additional administrative costs borne by the SCWD at each water curtailment stage

Methodology for Economic Impact Analysis

The methodology applies a standard "regional economic impact analysis" approach and associated modeling tool to assess curtailment impacts on the City's economy, and on Santa Cruz County as a whole.

Focusing on Water-Dependent Business Sectors

The methodology focuses on local business, UCSC, golf course, and North Coast agriculture sectors that are highly water dependent (see Table 3 below for a full listing of sectors). These are business sectors for which access to a relatively large supply of water is essential to the ability to provide their goods and services (i.e., where reduced access to water will adversely impact the level of business operation or, perhaps, lead to business closure). These water-dependent business sectors were identified and assessed based on the SCWD's water use data and are consistent with a prior analysis conducted for the City (Mitchell, 2015)⁵.

The analysis uses projected industry-level changes in economic output (e.g., business net revenues), based on scenarios of how businesses may respond to water curtailment levels of varying severity (as described in a subsequent section of this TM, and in Appendix A).

Within the analysis, multiple "industries" (business types) can be included in a "sector". We applied the sector-level change to output to each industry within the sector. More specifically, the IMPLAN regional economic impact model we applied (as detailed further in a subsequent section of this TM) defines the Food Manufacturing sector as including 19 industries, each of which has a different multiplier effect and subsequent economic impact (e.g., a 20% decrease to output in the "creamery butter manufacturing" industry has a different multiplier effect than the "coffee and tea manufacturing industry"). We identified the individual industries following the same approach used to identify the sectors, as included in Appendix B.

Direct Economic Impact Scenarios by Business Sector

For each highly water-dependent sector, the *direct impacts* on business "output" at each potential curtailment stage were assigned based on available data and professional judgement.⁶

For example, the tourism-related business sectors include accommodations (e.g., hotels and motels) and food service providers (e.g., restaurants). Both business types are relatively large water users and highly dependent on water supply to operate at their desired levels. Reductions in the amount of water allocated to these businesses are expected to result in reductions in the number of guests that hotels and restaurants can host over the course of a drought period (e.g., restaurants may need to scale back their hours or days of operation, and hotels may limit occupancy levels). The recent COVID pandemic provides useful insights into the relationship between key tourism-related businesses and the associated level of water use in those business types, per Text Box 1.

⁵ There are a few differences from the Mitchell (2015) analysis: Computer and electronic products were excluded from our main analysis and only included as part of the sensitivity analysis; UCSC and North Coast Agriculture were added.

⁶ Economic output in this type of analysis typically refers to the net revenues of a business (Demski, 2020).

Given data limitations and uncertainties regarding how various businesses would respond (see section on Caveats and Limitations, as well as Appendix A), a range of direct impacts were assigned to each sector for each of potential curtailment Stages 3, 4 and 5. These percentage reduction "direct impact scenarios" for each water dependent business sector are shown in Table 3.

Text Box 1: Tourism Economic Impacts and Associated Water Use

The pandemic had a significant impact on tourism and the economic returns that accommodation and food service businesses across Santa Cruz County, as documented by a report issued by the State of California's *Visit California* program: *The Economic Impact of Travel* (Visit California, 2022). Comparing data from a "normal" 2019 to COVID-impacted 2020, total tourism spending in the county declined by nearly half, with associated negative impacts on business earnings (e.g., net revenues, output), employment, and local tax revenues declining by 23% to 28%.

Also shown is the associated similar decline of 28% in peak season water use by the restaurant and accommodation sectors combined, based on SCWD consumption and billing data. This comparison suggests that at a Stage 4 business-targeted water use reduction of 21%, for example, we might expect tourism-related business output to contract by roughly 20% to 30%.

Total Spending	-47%
Earnings	-23%
Jobs	-23%
Local Tax Revenues	-28%
Peak Season Water Use (Hotels and Restaurants combined)	-28%
Sources: Visit California. 2022: SCWD Bi	lling Data

Tourism-Sector Impacts and Water Use: 2020 v. 2019

Sector	Stage 3	Stage 4	Stage 5
Nursery, landscape, and garden	45% – 60%	50% – 70%	50% – 70%
Food services and drinking places	5% – 15%	25% – 40%	50% - 65%
Food manufacturing	5% – 15%	25% – 40%	50% – 65%
Breweries and distilleries	5% – 15%	25% – 40%	50% - 65%
Car washes	5% – 15%	25% – 40%	50% - 65%
Cement/concrete manufacturing	5% – 15%	25% – 40%	50% - 65%
Accommodation	5% – 15%	20% - 30%	40% - 60%
Amusement and theme parks	5% – 15%	20% - 30%	40% - 60%
Fitness and Recreational Centers	5% – 15%	20% - 30%	40% - 60%
Tourism-supported retail	5% – 15%	20% - 30%	40% - 60%
UCSC	15% – 25%	30% – 65%	30% - 65%
Golf courses	25% – 35%	40% - 60%	65% – 85%
North Coast agriculture	5% – 15%	20% – 30%	40% - 60%

Table 3. Percentage output reduction scenarios for water dependent business sectors

Nursery, landscape, and garden

These businesses will be hit hardest by any curtailments because their customer base is largely homeowners who will also have less capacity to water and purchase plants. We assume these businesses will already be hit hard at Stage 2, such that the incremental change of moving to Stage 3 will be modest.⁷

Restaurants, manufacturing, and car washes

These businesses are grouped together because the impacts of curtailments are likely going to be similar. Tourism-related economic data (Visit California, 2022) and SCWD water usage data from 2019 to 2022 demonstrates the food services sector suffered a 46% reduction in consumer spending during the pandemic as compared to the previous year and used 42% less water. The Stage 4 curtailment is assumed to have a similar impact as that of the pandemic on water usage in the applicable sectors. Manufacturing and car washes are very water-dependent and are assumed to be similarly impacted by curtailments.⁸

⁷ Landscape service-providers and related businesses are likely to have seen a significant shift in their business sector as the result of the series of water supply shortfalls experienced over the past decade. Those landscape and garden businesses that have survived have likely done so by shifting to providing xeriscape and related water efficient goods and services compatible with a more water-constrained and water-conserving customer base.
⁸ It is unlikely many of the businesses in these sectors would make rapid recoveries at the end of the peak water use season, as it is likely to take many months to restore the SCWD's reservoir levels, and multi-year drought periods are likely to reoccur periodically.

Tourism and recreation

The business sectors that fall into this category include accommodation, amusement and theme parks, fitness and recreational centers, and tourism-supported retail. Tourism-related economic data (Visit California, 2022) and SCWD water usage data demonstrates the accommodation sector endured a 34% reduction in consumer spending during the pandemic as compared to the previous year, and it ended up using 23% less water in the peak season. The impact on accommodation was not as severe as it was on the food service sector, which is why they are treated differently in this analysis. The Stage 4 curtailments (21% water use reduction) are assumed to have a similar impact as that of the pandemic on water usage (23%) and the associated impacts on the sector's net revenues and the local economy. The same shock is assumed to occur with the other tourism-related businesses.

Golf courses

The SCWD provides water to two golf courses in its service area: the public DeLaveaga Golf Course and the private Pasatiempo Golf Course. The Pasatiempo Golf Course receives recycled water (secondary treated wastewater) from Scotts Valley for 90% of its irrigation needs, so will likely be relatively unimpacted by the curtailments. The DeLaveaga Golf Course, however, relies on SCWD water service and will likely be highly impacted by curtailments. We assume that DeLaveaga would have to close operations at a Stage 5 water curtailment (of 90%) because there will be insufficient water to irrigate the greens. The DeLaveaga Golf Course will likely need to take additional actions to remain in business during Stage 4 and 5 curtailments, such as actions taken by Australian golf courses because of the Millennium Drought, as well as similar actions taken by several California golf facilities.⁹

UCSC

UCSC's water use is 23% for irrigation, and the balance for student housing, food services, and other indoor uses. By Stage 3, the targeted 28% reduction will need to cut into indoor uses. By Stages 4 and 5, cutbacks to meet the associated reduction targets of 38% and 45% may not be feasible if students remain residing or spending large portions of their days on campus.

SCWD water usage data demonstrates that UCSC's water use went down significantly when students went remote during the pandemic, with a 39% reduction in peak season water use. We assume the impact of a Stage 4 curtailment scenario would thus be similar the impact of the pandemic because UCSC would have to require students to go remote to avoid going over its water allocation. We assume no change between stages 4 and 5 because the big 'hit' comes when students go remote at stage 4.

North Coast Agriculture

Given the 12 farms in the service area receive water from multiple sources, we assumed a similar relationship to output as we did for the restaurant sector. We assume that over time with less water, farmers will be forced to irrigate fewer acres, or switch to less water-intensive crops.

⁹ Examples of golf course adaptations include installing liners in artificial lakes, turning off sprinklers in less trafficked areas, and investing in recycled water (including use of on-site treatment facilities) (Anderson, 2015).

Direct Economic Impacts on Household Customers

The Water Shortage Contingency Plan (SCWD, 2021) outlines an excessive use penalty system to provide a financial disincentive for customers to stay within their allocation. The inclusion of excess use penalties during water rationing is consistent with the same approach used in the 2009 WSCP and included in the City's Municipal Code provisions codifying WSCP provisions since that time.

Note that the Department does not wish to impose these penalties. Rather, under dire circumstance imposed on the system by severe or extended drought, the penalties serve as a necessary tool to incentivize everyone to do their part to ensure that scarce water is available for essential human health and safety purposes. The penalties are structured to disincentivize those who would otherwise ignore their allocations and instead opt to pay for their overuse of water. While the penalties might be viewed as draconian or as "punishment," their necessary objective is to have everyone in the community share the real burden of keeping the taps from running dry. As noted in the Santa Cruz Municipal Code [Section 16.01.140 I] (SCWD 2021):

The city's water is a scarce and irreplaceable commodity and [these penalties are] intended to equitably distribute that commodity among water department customers and to assure that, to the extent feasible, city water is conserved and used only for purposes deemed necessary for public health and safety... [T]he penalty schedule is not to be construed as creating a "water pricing" structure pursuant to which customers may elect to pay for additional water at significantly higher rates. To this end, a customer's repeated violation of this chapter shall result in either the installation of a flow restriction device or disconnection of the customer's property from the city's water service system at the customer's cost.

Excess use penalties are charged on a per unit basis based on the amount of customer water use over its allocation (see Table 4) and is applied on the customer's monthly water bill. These penalties are additional costs customers will have to pay should their water use exceed their allocation and are therefore important to account for in this analysis as a reduction in disposable income. Disposable income is money that is available to be saved or spent (Clouse, 2021a). Reductions in household disposable income will in turn result in some reduced spending on locally provided goods and services, which in turn will work its way through the regional economy as indirect and induced impacts.

Overage	Excess use penalty per overage
1 CCF over allocation	\$25
2 CCF over allocation	\$75
3 CCF over allocation	\$125

Table 4	. Excess	use per	alties	based	on	overage
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The SCWD currently has 19,000 single family and 7,085 multifamily residential households (SCWD, 2021, and SCWD account data) – a total of 26,085 households in its service area. The

2014 and 2015 water restrictions imposed by the SCWD resulted in an average of 5% of households exceeding their allocation. These restrictions were Stage 3 curtailments under the old Water Use Management Plan, which were 15-25% reduction of water use (SCWD, 2016).

SCWD's former water restrictions (from 2016) were far less stringent than the current SCWD (2021) restrictions. For example, under Stage 3 of the 2016 policy, residential customers received a 10 CCF per month allocation.¹⁰ In contrast, the 2021 plan limits the residential allocation at Stage 1 to only 5 CCF per customer, and to 3 CCF at Stage 3 (based on a household size of three).

Additionally, over the past several years, the demand has become more hardened in the SCWD's service area. As a result, we apply scenarios of the SCWD imposing the excess use penalty to 30% of households under a Stage 3 curtailment scenario (with a 4 CCF monthly limit for households of 3 persons), and 50% under Stage 4 and Stage 5 curtailment scenarios (with a water allotment of 3 CCF per household of 3 persons). These scenarios are based on the Department's experiences with households exceeding their allotments during the 2021 Stage 1 curtailments.

Tables 5 and 6 present the specific assumptions at each stage and the associated costs assuming the full six months of the peak season. The total excess use penalties at each stage are used in the economic impact analysis to reflect the direct impact on disposable household income. The estimated total penalties amount to significant sums, and the Department hopes not to impose such penalties by augmenting its water supply to ensure the City does not run out of water in a multi-year drought.

Overage above 4 CCF	Excess use penalty per overage	Percent of noncompliant households	Number of noncompliant households	Total excess use penalty
1 CCF over	\$25	20%	5,217	\$782,550
2 CCF over	\$75	10%	2,609	\$1,173,825
	Total	30%	7,826	\$1,956,375

Table 5. Scenario for excess use penalties on households for Stage 3

Table 0. Scenario for excess use benariles on nouseriolus for Stages 4 and 3
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Overage above 4 CCF	Excess use penalty per overage	Percent of noncompliant households	Number of noncompliant households	Total excess use penalty
1 CCF over	\$25	10%	2,609	\$391,275
2 CCF over	\$75	20%	5,217	\$2,347,650
3 CCF over	\$125	20%	5,217	\$3,912,750
Total		50%	13,043	\$6,651,675

¹⁰ For a household of up to 4 people. Additional water was allocated to those customers with larger households.

Indirect and Induced Economic Impacts (Applying the IMPLAN Model)

The direct economic impacts from the scenarios described above were used as input for the widely applied and well-accepted regional economic impact, input-output (I-O) model, IMPLAN.¹¹ The IMPLAN model, and types of economic impacts it is used to analyze, are briefly described in Text Box 2. In essence, the IMPLAN model simulates how direct economic impacts in each sector work their way through the local economy in the form of *indirect* and *induced* economic impacts.

For example, reduced occupancy at local hotels means reduced hotel revenues (a *direct* impact), which is likely to result in reduced wages and salaries paid to hotel employees, reduced purchases of goods and services provided (in part) by local laundry and foodstuff vendors, etc. (*indirect* impacts). The indirect impacts in turn will reduce incomes in those affected local sectors, with subsequent reductions in expenditures on other local goods and services (*induced* impacts). Outputs from the IMPLAN simulations include reductions in regional economic output, employment, labor income, and tax revenues.

The IMPLAN analysis was conducted for two separate sets of Stage-specific impacts: (1) the impact on business activities of key water-dependent sectors¹² and (2) the impact of reducing residential customers' household disposable incomes due to anticipated excess use penalties.¹³ IMPLAN uses zip code data. We included all zip codes included in the Santa Cruz Water SCWD, specifically 95060, 95062, 95064, 95065. The base year is 2019 and all dollars are reported in 2022 dollars.

Economic Impact at County level

Our economic analysis focuses primarily on the combined direct, indirect, and induced impacts within and to the City of Santa Cruz, as reflected by the SCWD service area. In addition, we explored how the economic impacts of a SCWD water shortage also extend beyond City boundaries and impact Santa Cruz County as a whole. That is, direct impacts created within the City also are magnified and distributed throughout the broader regional economies, specifically between the SCWD service area and the county outside the service area.

To assess County-wide impacts, we used IMPLAN's Multi-Regional Input-Output Analysis (MRIO). "Multi-Regional Input-Output (MRIO) analysis makes it possible to track how an impact on any of the 546 IMPLAN Industries in a Study Area region affect the production of all 546 Industries and household spending in any other region in the US (state to state, county to county, zip code to zip code, county to multi-county, county to state, etc.)" (Clouse, 2022).

We defined our regions as follows:

- All zip codes within the SCWD service area; and
- All zip codes within Santa Cruz County, not including those within the SCWD service area.

¹¹ IMPLAN was initially developed and applied by the federal government (see history of IMPLAN at <u>https://implan.com/history/</u>).

¹² The impact on business was run as an "industry output event" following Clouse (2021b)

¹³ The impact on households were run as a change in household income, following Clouse (2021c) and discussions with IMPLAN staff.

Text Box 2: Regional Economic Impacts and the IMPLAN Model

The IMPLAN model (IMpact Analysis for PLANning) is an economic input-output (I-O) model, originally developed by the federal government, that contains information on the relationships within an economy, both between businesses, and between businesses and final consumers. IMPLAN uses this information to predict changes in overall economic activity resulting from a flow of money into and out of the local economy (e.g., a visitor spending). IMPLAN is widely used by academics and the public and private sectors, and it is generally accepted as the standard for economic I-O analysis.

To estimate regional economic impacts, IMPLAN constructs local level multipliers. Multipliers describe the response of the economy to a change in demand or production. Multipliers measure the economic impact of direct effects, as well as how the direct effects ripple through the economy to create indirect and induced impacts. The magnitude of indirect and induced effects depends on the propensity of businesses and households in the region to purchase goods and services from local suppliers. Purchases from local suppliers have ripple effects in the economy, whereas purchases from non-local (outside of the county in this case) suppliers does not result in ripple effects because the money spent for inputs leaves the local economy. IMPLAN accounts for this in the development of local multipliers by assigning regional purchase coefficients to goods and services purchased by individual sectors and households. IMPLAN also reports implications for state and local tax revenues.

IMPLAN measures the direct, indirect, and induced impacts of changes to a regional economy described as:

- **Direct impacts** are the initial changes in business revenues ("output") such as the increased receipts from enhanced tourism, or a decrease in receipts when limited water availability limits businesses operations. Direct impacts include money tourists spend while visiting the area on food, lodging, and retail purchases.
- Local businesses that benefit from direct spending then, in turn, spend additional (or reduced) money on goods and services that they need to operate their businesses. These are termed *indirect expenditures*.
- Direct and indirect spending generates employment in the local region, creating additional (or reduced) income for households, which generates further changes in local spending known as *induced expenditures*.

More information on IMPLAN can be found on their website: <u>https://implan.com/.</u>

Key Findings

The economic analysis provides a considerable amount of empirical detail. In this section, we focus on some of the higher-level findings. Additional and more detailed empirical results are provided in Appendices C through F.

An economic impact analysis is, by its nature, an imprecise exercise in which numerous uncertainties exist and many key assumptions need to be made (as described throughout this TM and highlighted in the next section). Nonetheless, the estimates developed here may well

be conservative, and are consistent with findings derived from other investigations of water supply shortages (e.g., M-Cubed, 2008a, 2008b, for East Bay Municipal Water District). ¹⁴

As shown in the tables and associated text discussions that follow, water supply curtailments at Stages 3, 4 and 5 are anticipated to create significant economic losses to the community. These estimated losses in economic output, jobs, tax revenues, and other key metrics reveal how much value there is likely to be if/when the City makes investments to reduce the size of potential future water supply shortfalls.

For example, the estimated economic losses can be interpreted relative to the amount of added water supply that would be needed to avoid a given level of curtailment (e.g., as a cost per MG, or acre-foot, of shortage). The resulting "cost" of not having sufficient water can then be used as a benchmark against which to compare the expense of investments needed to secure that amount of water. That is, the economic cost of not having enough water may be viewed as the benefit (avoided cost) of acquiring the additional water. Further, by investing in a more secure and reliable water supply portfolio, the community may be able to attract businesses from locations in which the water supply is less secure and less reliable.

High-Level Results

Table 7 summarizes the estimated change in overall impact on City economic output from moving to increasingly more restrictive curtailment stages on businesses and other non-residential sectors. Also shown is the implied economic cost per volume of water targeted overall for peak season use reductions.

For example, moving from Stage 3 to Stage 4 reduces estimated annual economic output within the City by between approximately \$210 million and \$262 million. This amounts to \$1.5 million and \$1.9 million of lost economic output per MG of reduced water availability (based on 136 MG of additional water required to avoid moving from one curtailment stage to the next more severe curtailment stage for one water year peak period).

Another way of interpreting this finding is that if enough additional water supply was made available such that the City could avoid applying Stage 4 restrictions and instead implement the less restrictive Stage 3 limits (e.g., adding the equivalent of 10% of normal peak season water usage, i.e., 136 MG), then the City would gain an estimated additional economic output of \$210 million to \$262 million. This translates to \$1.5 million to \$1.9 million of added economic output per MG added (compared to the water supply augmentation options currently being evaluated by the City, which are each expected to cost less than \$30,000 per MG produced). This is one way of viewing the value added of developing an additional source of available water supply.

¹⁴ For example, an analysis of the economic impacts of water supply shortages for the East Bay Municipal Utility District indicates that estimated lost economic output grows rapidly if curtailments rise above a 15% supply reduction. The estimated loss of output was nearly \$20 billion – or more than \$2 million per MG foregone – if a 15% shortage were to grow to a 25% curtailment level (derived from M-Cubed, 2008a and 2008b; updated to 2022 dollars).

Impact	Change in output (\$M)	\$/MG** (\$M)	\$/AF (\$M)
Stage 2* to 3	\$114.4 – \$242.9	\$0.8 - \$1.8	\$0.3 – \$0.6
Stage 3 to 4	\$209.9 – \$262.4	\$1.5 – \$1.9	\$0.5 – \$0.6
Stage 4 to 5	\$254.2 – \$284.6	\$1.9 – \$2.1	\$0.6 - \$0.7

Table 7 Cite	· only increa	ontol immosto	from husiness	ourtoilmoonto (laalaat inductuiaa	الدامية
Table 7. City	y-only incren	iental impacts	mom pusiness	curtaiments	select maustries	omy

* Assumes *de minimus* economic impact at Stage 2 for businesses

** Applies 136 MG need to meet each Stage's 10% incremental reduction in total peak season demand

Table 8 provides the same information as Table 7 but includes County-wide economic impacts. The results in Table 8 reflect the degree to which impacts generated within the City – by SCWD-imposed water curtailments on its non-residential customers – "spill over" to also impact the broader county-level economy. In general, county-wide impacts on regional economic output from City-based curtailments are roughly 10% greater than the impacts experienced within the City itself.

Impact	Change in output (\$M)	\$/MG** (\$M)	\$/AF (\$M)
Stage 2* to 3	\$126.1 – \$266.8	\$0.9 – \$2	\$0.3 – \$0.6
Stage 3 to 4	\$229.4 – \$287	\$1.7 – \$2.1	\$0.5 – \$0.7
Stage 4 to 5	\$277.8 – \$311.2	\$2 – \$2.3	\$0.67 – \$0.75

Table 8. County-level incremental impacts from business curtailments (select industries only)

* Assumes *de minimus* economic impact at Stage 2 for businesses

** Applies 136 MG needed to meet each Stage's 10% incremental reduction in total peak season demand

Economic output is only one measure of the losses incurred from water supply curtailments imposed on businesses and other non-residential water customers. Table 9 shows the losses estimated at each Stage from business and other non-residential sector impacts, stated in terms of number of jobs, labor income, value added, and tax revenues, as well as the economic output foregone.

Metric (Losses)	Total impact at Stage 3	Total impact at Stage 4	Total impact at Stage 5
Output lost (\$M)	\$114.4 – \$242.9	\$324.3 – \$505.3	\$578.5 – \$789.9
Labor income lost (\$M)	\$53.8 – \$109.1	\$141.0 – \$218.6	\$245.7 – \$337.3
Value added lost (\$M)	\$68.6 – \$144.8	\$192.2 – \$299.3	\$341.6 – \$467.8
Employment (# of jobs lost)	1,146 – 2,428	3,236 – 5,066	5,752 – 7,902
Tax revenues lost: City of Santa Cruz*(\$M)	\$2.1 – \$5.4	\$8.0 - \$12.7	\$15.5 – \$21.1
Tax revenues lost: County (\$M)	\$0.7 - \$1.8	\$2.7 – \$4.3	\$5.3 – \$7.1
Tax revenues lost: State (\$M)	\$3.0 – \$7.5	\$10.9 – \$17.1	\$20.6 – \$28.0
Tax revenues lost: Federal (\$M)	\$8.4 – \$17.5	\$23.0 – \$35.8	\$40.6 – \$55.6
Total Tax Revenues Lost: Total (\$M)	\$14.1 - \$32.2	\$44.6 – \$69.8	\$82.0 - \$111.8

Table 9. City-level negative economic impacts (losses) from select business and other non-residential curtailments

Including household-driven economic impacts arising from reduced disposable incomes (due to excess use penalties), along with the non-residential sector impacts described above, increases the total amount of loss associated with water supply curtailments, but only to a very small degree (Table 10). That is, the adverse economic impact of estimated excess use penalties on households has a relatively small impact on the community's overall economy as shown in Table 10, although some economically challenged individual households may be burdened considerably.

Metric (Losses)	Stage 3	Stages 4 and 5
Output lost	\$459,128.9	\$1,561,038.1
Labor income lost	\$164,992.5	\$560,974.6
Value added lost	\$302,656.8	\$1,029,033.1
Employment (# of jobs lost)	3.0	10.0
Tax revenues lost: City of Santa Cruz*	\$11,222.2	\$38,155.3
Tax revenues lost: County	\$7,818.3	\$12,901.1
Tax revenues lost: State	\$16,456.6	\$55,952.6
Tax revenues lost: Federal	\$29,866.3	\$101,545.3

* Includes sub-county general and sub-county special districts (e.g., road maintenance, fire protection).¹⁵

¹⁵ A complete list of the Santa Cruz Special Districts can be found at: https://www.co.santacruz.ca.us/Departments/Auditor-

ControllerHome/CountySpecialDistricts/ListofSantaCruzCountySpecialDistricts.aspx

Table 11 provides City-level impacts from the combined effects of curtailments on both the SCWD's residential and non-residential customers.

Metric (Losses)	Total impact at Stage 3	Total impact at Stage 4	Total impact at Stage 5
Output lost (\$M)	\$114.9 – \$243.4	\$325.9 – \$506.9	\$580.1 – \$791.5
Labor income lost (\$M)	\$54.0 – \$109.3	\$141.6 – \$219.2	\$246.3 – \$337.9
Value added lost (\$M)	\$68.9 - \$145.1	\$193.2 – \$300.3	\$342.6 – \$468.8
Employment (# of jobs lost)	1,149 – 2,431	3,236 – 5,066	5,752 – 7,902
Tax revenues lost: City of Santa Cruz*(\$M)	\$2.1 - \$5.4	\$8.1 - \$12.7	\$15.6 – \$21.1
Tax revenues lost: County (\$M)	\$0.7 – \$1.8	\$2.7 – \$4.3	\$5.3 – \$7.1
Tax revenues lost: State (\$M)	\$3.0 - \$7.5	\$10.9 – \$17.1	\$20.7 – \$28.0
Tax revenues lost: Federal (\$M)	\$8.4 – \$17.5	\$23.1 – \$35.9	\$40.7 – \$55.7

 Table 11. City-level negative economic impacts (losses) from combined business and residential curtailments

The sections below summarize key empirical results for each of Stage 3, 4 and 5. Further results and details are provided in Appendices C, D and E.

Key Results for Stage 3 Curtailments on Businesses and Other Non-Residential Customers

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Direct	\$104.3 – \$220.9	\$50.0 – \$100.8	\$62.7 – \$132.1	1,088 – 2,302
Indirect	\$6.8 – \$15.3	\$2.6 – \$5.9	\$3.7 – \$8.3	37 – 82
Induced	\$3.3 – \$6.7	\$1.2 – \$2.5	\$2.1 – \$4.4	21 – 43
Total	\$114.4 – \$242.9	\$53.8 – \$109.1	\$68.6 – \$144.8	1,146 – 2,428

Table 12. Range of negative economic impacts (losses) of Stage 3 water curtailments on included businesses: City/Service Area

Impact type	Tax revenues lost: City of Santa Cruz* (\$M)	Tax revenues lost: County (\$M)	Tax revenues lost: State (\$M)	Tax revenues lost: Federal (\$M)	Tax revenues lost: Total (\$M)
Direct	\$1.8 - 4.9	\$0.6 - \$1.7	\$2.7 – \$6.8	\$7.7 – \$16.0	\$12.8 – \$29.3
Indirect	\$0.1-0.3	\$0.1 - \$0.1	\$0.2 – \$0.5	\$0.5 – \$1.1	\$0.9 – \$1.9
Induced	\$0.1-0.2	\$0.0 - \$0.1	\$0.1 – \$0.2	\$0.2 – \$0.5	\$0.4 – \$0.9
Total	\$2.1 - 5.4	\$0.7 – \$1.8	\$3.0 – \$7.5	\$8.4 – \$17.5	\$14.1 – \$32.2

Table 13. Range of In-City negative tax impacts (losses) of Stage 3 water curtailments on included businesses

* Includes sub-county general and sub-county special districts (e.g., road maintenance, fire protection)¹⁶

Key Results for Stage 4 Curtailments on Businesses and Other Non-Residential Customers

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Direct	\$294.6 – \$458.8	\$129.6 – \$200.8	\$175.0 – \$272.4	3,067 – 4,802
Indirect	\$21.0 - \$32.9	\$8.2 – \$12.8	\$11.5 – \$18.0	113 – 176
Induced	\$8.7 – \$13.6	\$3.2 – \$5.0	\$5.7 – \$8.8	56 – 88
Total	\$324.3 – \$505.3	\$141.0 - \$218.6	\$192.2 – \$299.3	3,236 – 5,066

Table 14. Range of negative economic impacts (losses) of Stage 4 water curtailments on included businesses: City/Service Area

Table 15. Range of negative tax impacts (losses) of Stage 4 water curtailments on included businesses

Impact type	Tax revenues lost: City of Santa Cruz* (\$M)	Tax revenues lost: County (\$M)	Tax revenues lost: State (\$M)	Tax revenues lost: Federal (\$M)	Tax revenues lost: Total (\$M)
Direct	\$7.5 – \$11.7	\$2.5 – \$4.0	\$9.9 – \$15.6	\$20.9 – \$32.5	\$40.8 – \$63.8
Indirect	\$0.4 – \$0.6	\$0.1 - \$0.2	\$0.6 - \$1.0	\$1.5 – \$2.4	\$2.7 – \$4.1
Induced	\$0.2 – \$0.3	\$0.1 – \$0.1	\$0.3 – \$0.5	\$0.6 – \$0.9	\$1.2 – \$1.8
Total	\$8.0 - \$12.7	\$2.7 – \$4.3	\$10.9 – \$17.1	\$23.0 - \$35.8	\$44.6 – \$69.8

* Includes sub-county general and sub-county special districts (e.g., road maintenance, fire protection)¹⁷

¹⁶ Ibid.

¹⁷ Ibid.

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Direct	\$524.9 – \$716.6	\$225.0 – \$308.9	\$310.5 – \$425.3	5,448 – 7,484
Indirect	\$38.3 – \$52.3	\$15.1 – \$20.6	\$21.1 – \$28.7	206 – 282
Induced	\$15.3 – \$21.1	\$5.6 – \$7.7	\$10.0 – \$13.7	99 – 136
Total	\$578.5 – \$789.9	\$245.7 – \$337.3	\$341.6 – \$467.8	5,752 – 7,902

Table 16. Range of negative economic impacts (losses) of Stage 5 water curtailments on included businesses: City/Service Area

Table 17. Range of negative tax impacts (losses) of Stage 5 water curtailments on inclue	ded
businesses	

Impact type	Tax revenues lost: City of Santa Cruz* (\$M)	Tax revenues lost: County (\$M)	Tax revenues lost: State (\$M)	Tax revenues lost: Federal (\$M)	Tax revenues lost: Total (\$M)
Direct	\$14.5 – \$19.6	\$4.9 – \$6.6	\$19.0 – \$25.8	\$36.8 – \$50.4	\$75.1 – \$102.4
Indirect	\$0.7 – \$0.9	\$0.2 – \$0.3	\$1.1 – \$1.5	\$2.8 – \$3.8	\$4.8 – \$6.5
Induced	\$0.4 – \$0.5	\$0.1 - \$0.2	\$0.6 – \$0.8	\$1.0 - \$1.4	\$2.1 – \$2.9
Total	\$15.5 – \$21.1	\$5.3 – \$7.1	\$20.6 – \$28.0	\$40.6 – \$55.6	\$82.0 - \$111.8

* Includes sub-county general and sub-county special districts (e.g., road maintenance, fire protection)¹⁸

Caveats and Limitations

All economic impact analyses and forecasts – and the tools and data applied in developing such assessments – inevitably are subject to numerous uncertainties and by necessity include several assumptions. Nonetheless, with suitable care, use of conservative and transparent assumptions, and sensitivity analyses, the outcomes provide useful information. In this section, we aim to describe the key uncertainties we faced, articulate the key assumptions made in developing the analysis, and describe the impact they may have on our results.

Business Sectors Included or Excluded

Several types of water-dependent businesses were included in the analysis, and several excluded because of uncertainty about their relevance as potentially large water users within the SCWD service area. This is most evident in the food manufacturing and computer and electronics sectors. Appendix B provides details on the business types used within the core analysis, and Appendix C provides details on those added in our sensitivity analysis.

¹⁸ Ibid.

Throughout this TM, we report the results from the more conservative, shorter list of businesses impacted (see Table B1). Adding in the additional business types increases the extent of economic loss. For example, at Stage 3, there is an increase in output lost ranging from \$9.4 and \$28.2 million annually and additional jobs lost ranging from 22 to 65. Additional detail is provided in Appendix B.

Additionally, we did not include non-residential water service customers in the medical facilities, nursing care, and related medical and elder-care service sectors because we assume they would take priority over other businesses in terms of water usage, even though they tend to be relatively high-volume water users. This is a conservative omission, and it assumes businesses will stay within their allocations. It is possible, however, that medical and related care services would need to be scaled back to meet curtailment targets, with an associated nonmonetary cost to the community (in terms of patient care) as well as a potentially large adverse economic impact (which likely would be significant, given the large revenues the sector earns from the services provided).

Business Recovery after Peak Season

In the analysis, we apply a business downturn for the full year, not just the six-month peak water use season. If some businesses can rebound quickly after a curtailment period, then our results might overstate the economic losses. However, many of the businesses most impacted – such as accommodations, restaurants, and other tourism-related sectors – have strong seasonal business patterns that match the peak water use period. Further, in the months following a drought-impacted peak water use period, the City is likely to still be in a water-short situation and seeking to refill Loch Lomond and hedge against the increasing likelihood of a multi-year drought continuing into the following year or beyond. And, after a year or two of water shortage-impacted business revenues, some businesses may choose to close entirely or relocate. Thus, we do not expect that our use of year-long impacts generates an over-statement of adverse economic impacts.

New Businesses Attracted to the City

Increased water supply reliability is likely to help attract new businesses to the region, whereas the risk of water shortages is likely to create a disincentive for new enterprises to locate (or existing companies to expand) in the City. We have not included such potential business location impacts within our analysis, which likely results in an underestimate of the adverse impacts of curtailments.

Impacts from Penalty-Based Reductions in Household Disposable Income

Estimated levels of excess use penalties are applied in our analysis to assess the impact of reducing disposable income on those residential households projected to exceed their water use allotments in Stages 3, 4 and 5. There are several uncertainties associated with this aspect of the analysis, including how many households would actually exceed their water allotments, the degree to which the SCWD would apply and enforce collection of such penalties, and how

the loss of disposable income would impact household spending patterns.¹⁹ However, the adverse economic impact projected from household-level losses from the penalties is relatively very small, and we rely predominantly on the impacts on the non-residential customers in reporting our key findings (i.e., the household level impacts we develop do not affect our key outcomes and interpretations).

In addition, not included in our economic impact estimates are the adverse effects of the additional costs borne by SCWD customers due to increased administrative costs borne by the utility at high-level curtailment stages, or the impact of drought cost recovery fees. Ultimately, all these costs would be borne by the customers of the system, to cover the actual total costs of service incurred by the Department.

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¹⁹ From Implan re: change in HH spending (Clouse, 2021c): "In the case of a rate hike, you would see a reduction or negative impact in households... Giving a household less disposable income doesn't necessarily mean they won't pay their student loans or buy groceries. They may instead cut their utility usage or decrease their entertainment budget. If the increase is small enough it may have little to no impact on household spending for any group. Remember, different households may respond differently, depending on the size of the rate increase, their needs, and income level. A larger increase will likely affect the spending of lower income households but may not affect the spending of higher income households as these payments may come from savings (leakages in IMPLAN). Per conversations with IMPLAN, modelers are advised to add taxes and savings into the IMPLAN inputs to account for the fact they are removed during the model runs. However, to be conservative, we did not make assumptions on taxes and savings and therefore our results may be an underestimate of the impacts."

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Appendix A: Economic Impacts Grow Proportionally Greater as Curtailments get More Restrictive

The degree to which a business' economic activity declines with water supply curtailments will vary according to many case-specific circumstances. Nonetheless, the level of adverse impact on a business is likely to grow at a proportionally increasing rate as curtailments get more severe (i.e., a 10% more restrictive curtailment is likely to lead to a greater than 10% impact on output). The following discussion explains this likely relationship of proportionally greater economic impacts as curtailment levels get more restrictive.

Some business customers may use all the water they purchase as essential inputs to their output production. In such cases, there is little or no room to accept water supply limitations without also cutting back on the level of production, and economists would say that output in this case is "inelastic" with respect to water availability. In such cases, a 20% reduction in water supply (for example) would likely result in a significant reduction in production levels, which in turn would likely translate into reduced payroll (workers laid off or hours scaled back), reduced business income, fewer tax revenues generated, and so forth.

In other and probably more typical circumstances, CII entities use water for a variety of purposes, including landscape irrigation, cleaning, cooling, and production processes. In such situations, a CII customer can probably accommodate a modest curtailment in water supply by eliminating or reducing nonessential water uses (e.g., landscape irrigation), and apply the remaining allocation to essential production processes without a loss of product output and income.

One way of visualizing this important relationship between CII output and water supply curtailment levels is shown in Figure A.1. The vertical axis represents the output of the firm, and the horizontal axis reflects the percentage of water use restrictions. With a full allotment of water (0% curtailment), the firm produces 100% of its targeted output, as shown at point "a" on the curve.



Figure A.1. Relationship between business output and the level of water supply curtailment.

To the extent that the CII entity uses water in "nonproduction" activities (e.g., landscape irrigation around a factory or office building), it can incur some level of water-use curtailments without impacting output. Thus, there is some level of curtailment for which little or no impact on production output is anticipated. This is depicted as the CII entity being at point "b" in the graph, using up to X% less water but still able to produce 100% of its product output. For some CII customers, X% may be quite high—perhaps 10%, or even greater than 40%, depending on specific circumstances. This means that if water use restrictions of X% or less are placed on the entity, there would be little or no change in production and, hence, little or no regional economic impact. However, for some CII entities, X may be close to 0%, meaning that any level of water supply curtailment would have an adverse impact on production and, hence, a negative economic impact.

Beyond X% of normal year water consumption, the firm's water use is directed at its main production processes. Thus, any curtailment greater than X% begins to have a negative impact on output and, hence, the regional economy. Thus, the output curve declines beyond an X% curtailment. This is shown in the figure by the decrease in production output as the CII entity faces curtailment levels greater than X%.

For curtailments exceeding X%, perhaps the CII entity has opportunities to make more efficient use of some of its water-consuming production activities. In such a case, output falls at a relatively modest rate relative to the water-use curtailment beyond X%, say up to a Y% curtailment, where the firm is operating at point "c." In other words, the output impacts from a loss of water availability of between X% and Y% may be proportionately less than the additional water curtailment, for some productive water uses. This results in a relatively low level of output decline between points "b" and "c."

However, beyond a Y% curtailment, the limited availability of water may have an increasingly significant impact on the ability (or willingness) of the firm to produce, resulting in

November 1, 2022

proportionately greater output impacts as less water is available. This is reflected where the output curve begins to decline more steeply at curtailments greater than Y%, as shown by the steeper slope between points "c" and "d."

At some level of curtailment, Z%, the level of water supply reduction reaches a point where the firm is no longer able or willing to continue production. It may simply be physically impossible to operate their facility at water curtailment levels of Z% or greater, or it may no longer be economically viable to operate at production levels below what it is feasible to generate at Z%. Or, it may become economically advantageous to relocate activities to another, more water abundant region (either temporarily or permanently). Thus, once a firm reaches point "d" in Figure A.1, output drops to zero (i.e., the local plant is shut down).

Naturally, the exact shape of the relationship shown in Figure A.1 will vary considerably across sectors, and even across entities within the same general business or industrial category. However, the basic relationship is likely to be consistent across most CII entities. As water supply becomes less reliable, firms may be able to withstand initial small restrictions in water use with limited impacts on their levels of production, employment, and income. However, as curtailments increase in severity, it is increasingly likely that production will start to decline dramatically, and that at some level of water shortage, the facility may decide to shut down operations entirely. The value of water supply reliability to the firm, and to the greater community, will depend on the entity-specific shape of the generalized relationship depicted in Figure A.1.

Source: This graphic and associated discussion draws from Raucher et al. (2015).

Appendix B: Business sectors and industries included in the analysis

Table B1. Business sectors and industries included in the IMPLAN analysis	
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Sector	IMPLAN Industry		
UCSC	Junior colleges, colleges, universities, and professional schools		
Car Washes	Car washes		
Numero landeren endereden	Greenhouse, nursery, and floriculture production		
Nursery, landscape, and garden	Landscape and horticultural services		
A	Hotels and motels, including casino hotels		
Accommodation	Other accommodations		
	Retail – Food and beverage stores		
Food Comission and Drinking Disease	All other food and drinking places		
Food Services and Drinking Places	Full-service restaurants		
	Limited-service restaurants		
Amusement and Theme Parks	Amusement parks and arcades		
Golf Courses and Country Clubs	Other amusement and recreation industries		
Fitness and Recreational Centers	Fitness and recreational sports centers		
	Creamery butter manufacturing		
	Animal, except poultry, slaughtering		
	Seafood product preparation and packaging		
Food Monufacturing	Bread and bakery product, except frozen, manufacturing		
Food Manufacturing	Dry pasta, mixes, and dough manufacturing		
	Roasted nuts and peanut butter manufacturing		
	Coffee and tea manufacturing		
	Spice and extract manufacturing		
North Coast Agriculture	Vegetable and melon farming		
North Coast Agriculture	Fruit farming		

Table B1. Business sectors and	l industries included in	the IMPLAN analysis
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Sector	IMPLAN Industry			
Drowering and distillaries	Breweries			
Breweries and distilleries	Distilleries			
Compart/comparts manufacturing	Cement manufacturing			
Cement/concrete manufacturing	Ready-mix concrete manufacturing			
	Retail – Food and beverage stores			
rounsm-supported retail	Retail – Clothing and clothing accessories stores			
	Dog and cat food manufacturing			
	Other animal food manufacturing			
	Nonchocolate confectionery manufacturing			
	Confectionery manufacturing from purchased chocolate			
	Frozen specialties manufacturing			
Food manufacturing included in sensitivity analysis	Canned fruits and vegetables manufacturing			
,	Frozen cakes and other pastries manufacturing			
	Meat processed from carcasses			
	Rendering and meat byproduct processing			
	Cookie and cracker manufacturing			
	All other food manufacturing			
Computer included in sensitivity analysis	Electronic computer manufacturing			

Appendix C: Sensitivity analysis

Sector	IMPLAN Industry
	Dog and cat food manufacturing
	Other animal food manufacturing
	Nonchocolate confectionery manufacturing
	Confectionery manufacturing from purchased chocolate
	Frozen specialties manufacturing
Food manufacturing	Canned fruits and vegetables manufacturing
	Frozen cakes and other pastries manufacturing
	Meat processed from carcasses
	Pendering and meat hyproduct processing
	Cookie and cracker manufacturing
	All other food manufacturing
Computer	Electronic computer manufacturing

Table C1. Additional business sectors and industries included in the sensitivity analysis

Table C2. Range of economic impacts of Stage 3 water curtailments with additional business sectors and industries: City impact only

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Selected industries	\$114.4 – \$242.9	\$53.8 – \$109.1	\$68.6 – \$144.8	1,146 – 2,428
All industries identified as potentially relevant	\$123.8 – \$271.1	\$55.2 – \$113.4	\$70.8 – \$151.6	1,168 – 2,493
Difference	\$9.4 – \$28.2	\$1.4 – \$4.3	\$2.2 – \$6.8	22 – 65

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Selected industries	\$324.3 – \$505.3	\$141.0 - \$218.6	\$192.2 – \$299.3	3,236 – 5,066
All industries identified as potentially relevant	\$369.2 – \$576.3	\$147.8 – \$229.4	\$202.9 – \$316.2	3,344 – 5,237
Difference	\$44.9 – \$71.0	\$6.8 — \$10.8	\$10.7 – \$16.9	108 – 171

Table C3. Range of economic impacts of Stage 4 water curtailments with additional business sectors and industries: City impact only

Table C4. Range of economic impacts of Stage 5 water curtailments with additional busines	SS
sectors and industries: City impact only	

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Selected industries	\$578.5 – \$789.9	\$245.7 – \$337.3	\$341.6 – \$467.8	5,752 – 7,902
All industries identified as potentially relevant	\$668.3 – \$909.9	\$259.3 – \$355.4	\$363.0 – \$496.7	5,967 – 8,185
Difference	\$89.8 – \$120.0	\$13.6 – \$18.1	\$21.4 – \$28.9	215 – 283

Appendix D: County-level results

Business

Table D1. Range of economic impacts of in-City Stage 3 water curtailments on
included businesses, at the County-wide level

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Direct	\$104.3 – \$220.9	\$50.0 - \$100.8	\$62.7 – \$132.1	1,088 – 2,302
Indirect	\$9.4 – \$20.8	\$3.5 – \$7.8	\$5.0 - \$11.1	51 – 113
Induced	\$12.3 – \$25.1	\$3.9 – \$8.1	\$7.9 – \$16.0	72 – 146
Total	\$126.1 – \$266.8	\$57.4 – \$116.6	\$75.6 – \$159.3	1,211 – 2,561

Table D2. Range of economic impacts of in-City Stage 4 water curtailments on included businesses, at the County level

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Direct	\$294.6 – \$458.8	\$129.6 – \$200.8	\$175.0 – \$272.4	3,067 – 4,802
Indirect	\$28.4 – \$44.4	\$10.8 – \$16.8	\$15.3 – \$23.9	154 – 241
Induced	\$32.6 – \$50.6	\$10.5 – \$16.2	\$20.8 – \$32.3	190 – 294
Total	\$355.5 – \$553.8	\$150.8 – \$233.9	\$211.0 – \$328.6	3,411 – 5,337

Table D3. Range of economic impacts of in-City Stage 5 water curtailments on included businesses, at the County level

Impact type	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)
Direct	\$524.9 – \$716.6	\$225.0 – \$308.9	\$310.5 – \$425.3	5,448 – 7,484
Indirect	\$51.4 – \$70.2	\$19.6 – \$26.8	\$27.8 – \$37.9	279 – 382
Induced	\$57.0 – \$78.2	\$18.3 – \$25.1	\$36.4 – \$49.9	332 – 455
Total	\$633.3 – \$865.0	\$262.9 – \$360.8	\$374.6 – \$513.2	6,058 – 8,322

Residential

Table D4. Range of negative economic impacts (losses) of Stage 3 water
curtailments on disposable household income at the County-wide level

Metric	Impact (losses)		
Output lost	\$485,557.7		
Labor income lost	\$173,005.5		
Value added lost	\$319,391.8		
Employment (# of jobs lost)	3		
Tax revenues lost: City of Santa Cruz	\$11,957.5		
Tax revenues lost: County	\$4,043.1		
Tax revenues lost: State	\$17,548.2		
Tax revenues lost: Federal	\$31,481.5		

Table D5. Range of negative economic impacts (losses) of Stage 4 and 5 water curtailments on disposable household income at the County-wide level

Metric	Impact (losses)
Output lost	\$1,655,497.2
Labor income lost	\$589,632.0
Value added lost	\$1,088,847.9
Employment (# of jobs lost)	10
Tax revenues lost: City of Santa Cruz	\$40,781.9
Tax revenues lost: County	\$13,789.3
Tax revenues lost: State	\$59,851.8
Tax revenues lost: Federal	\$107,319.8

Appendix E: Sector-level results

Businesses by seele	I. City/Selv	ice Alca.				
Sector	Assumed reduction	Output lost (\$M)	Labor income lost (\$M)	Value added lost (\$M)	Employment (# of jobs lost)	Tax revenues lost: City of Santa Cruz*(\$M)
Nursery, landscape, and garden	45% - 60%	\$53.6 – \$71.4	\$28 – \$37.3	\$32.5 – \$43.4	506 – 675	\$0.1 – \$0.3
Food services and drinking places	5% – 15%	\$29.7 – \$89.1	\$13.3 – \$39.8	\$18.8 – \$56.5	330 – 990	\$0.9 – \$2.6
Food manufacturing	5% – 15%	\$5 – \$15.1	\$1-\$3	\$1.5 – \$4.5	23 – 69	\$0.1 - \$0.4
Breweries and distilleries	5% – 15%	\$1.2 - \$3.5	\$0.1 - \$0.4	\$0.5 – \$1.4	3-8	\$0.1 – \$0.3
Car washes	5% – 15%	\$1 - \$2.9	\$0.5 - \$1.4	\$0.7 – \$2	6 – 19	\$0.1 – \$0.2
Cement/concrete manufacturing	5% – 15%	\$1.1 - \$3.4	\$0.2 – \$0.6	\$0.4 - \$1.1	3-8	\$0 – \$0.02
Accommodation	5% – 15%	\$4.2 – \$12.6	\$1.8 – \$5.3	\$2.6 – \$7.9	37 – 112	\$0.1 – \$0.3
Amusement and theme parks	5%-15%	\$2.9 – \$8.8	\$1.2 – \$3.7	\$1.9 – \$5.7	37 – 111	\$0.1 – \$0.3
Fitness and Recreational Centers	5%-15%	\$0.3 - \$0.8	\$0.1 - \$0.3	\$0.1 - \$0.4	5 – 16	\$0 - \$0.01
Tourism-supported retail	5%-15%	\$4.6 – \$13.9	\$1.9 – \$5.6	\$2.8 – \$8.4	44 – 131	\$0.2 – \$0.7
UCSC	15% – 25%	\$4.3 – \$7.2	\$2.1 – \$3.4	\$2.8 – \$4.6	64 – 107	\$0.06 – \$0.09
Golf courses	25%-35%	\$3.3 – \$4.6	\$1.7 – \$2.4	\$1.8 - \$2.5	51 – 71	\$0.04 - \$0.07
North Coast agriculture	5%-15%	\$3.2 – \$9.6	\$1.9 – \$5.8	\$2.1 – \$6.3	37 – 110	\$0.01 - \$0.04
Total		\$114.4 - \$242.9	\$53.8 - \$109.1	\$68.6 - \$144.8	1,146 - 2,428	\$2.1 - \$5.4

Table E1. Range of negative economic impacts (losses) of Stage 3 water curtailments on included businesses by sector: City/Service Area.

* Includes sub-county general and sub-county special districts (e.g., road maintenance, fire protection). ²⁰

²⁰ A complete list of the Santa Cruz Special Districts can be found at: https://www.co.santacruz.ca.us/Departments/Auditor-

 $Controller Home/County {\it Special Districts/List of Santa Cruz County {\it Special Districts.aspx}$

	Assumed	Output lost	Labor	Value added	Employment (# of jobs	Tax revenues lost: City of Santa
Sector	reduction	(\$M)	(\$M)	lost (\$M)	lost)	Cruz*(\$M)
Nursery, landscape, and garden	45% – 60%	\$59.5 – \$83.4	\$31.1 – \$43.6	\$36.2 – \$50.6	562 – 787	\$0.4 - \$0.5
Food services and drinking places	5% – 15%	\$148.5 – \$237.6	\$66.3 – \$106	\$94.2 – \$150.7	1,651 – 2,641	\$4.3 – \$6.8
Food manufacturing	5% – 15%	\$25.2 – \$40.3	\$5.1 – \$8.1	\$7.6 – \$12.1	116 – 185	\$0.6 – \$1.0
Breweries and distilleries	5% – 15%	\$5.8 – \$9.3	\$0.7 – \$1	\$2.3 - \$3.7	13 – 21	\$0.5 – \$0.7
Car washes	5% – 15%	\$4.8 – \$7.7	\$2.3 – \$3.7	\$3.4 – \$5.4	31 – 50	\$0.3 – \$0.4
Cement/concrete manufacturing	5% – 15%	\$5.6 – \$9	\$1 - \$1.6	\$1.8 – \$2.9	13 – 20	\$0.03 – \$0.06
Accommodation	5% – 15%	\$16.8 – \$25.2	\$7 — \$10.5	\$10.5 – \$15.7	150 – 224	\$0.4 – \$0.5
Amusement and theme parks	5%-15%	\$11.7 – \$17.5	\$5 – \$7.5	\$7.7 – \$11.5	148 – 222	\$0.4 - \$0.6
Fitness and Recreational Centers	5%-15%	\$1.1 - \$1.7	\$0.5 – \$0.7	\$0.6 – \$0.8	21 – 32	\$0.02 – \$0.03
Tourism-supported retail	5%-15%	\$18.5 – \$27.8	\$7.5 – \$11.3	\$11.2 – \$16.7	175 – 262	\$1.0 - \$1.5
UCSC	15% – 25%	\$8.6 – \$18.6	\$4.1 – \$8.9	\$5.6 – \$12	128 – 277	\$0.1 - \$0.2
Golf courses	25%-35%	\$5.3 – \$8	\$2.8 – \$4.2	\$2.9 – \$4.3	82 – 122	\$0.07 – \$0.1
North Coast agriculture	5%-15%	\$12.8 – \$19.3	\$7.8 – \$11.6	\$8.4 – \$12.6	147 – 220	\$0.06 - \$0.1
Total		\$324.3 – \$505.3	\$141 – \$218.6	\$192.2 – \$299.3	3,236 – 5,066	\$8.0 - \$12.7

Table E2. Range of negative economic impacts (losses) of Stage 4 water curtailments on included businesses by sector: City/Service Area.

* Includes sub-county general and sub-county special districts (e.g., road maintenance, fire protection). ²¹
| | Assumed | Output lost | Labor income | Value added | Employment
(# of jobs | Tax revenues
lost: City of
Santa |
|-------------------------------------|-----------|-------------------|-------------------|-------------------|--------------------------|--|
| Sector | reduction | (\$M) | lost (\$M) | lost (\$M) | lost) | Cruz*(\$M) |
| Nursery, landscape,
and garden | 45% – 60% | \$59.5 – \$83.4 | \$31.1 – \$43.6 | \$36.2 – \$50.6 | 562 – 787 | \$0.7 – \$1.1 |
| Food services and drinking places | 5% – 15% | \$297 – \$386.1 | \$132.5 – \$172.3 | \$188.4 – \$245 | 3,301 – 4,292 | \$8.5 – \$11.1 |
| Food manufacturing | 5% – 15% | \$50.3 – \$65.4 | \$10.1 – \$13.1 | \$15.1 – \$19.7 | 232 – 301 | \$1.2 – \$1.6 |
| Breweries and distilleries | 5% – 15% | \$11.6 – \$15.1 | \$1.3 - \$1.7 | \$4.7 – \$6.1 | 27 – 35 | \$0.9 – \$1.2 |
| Car washes | 5% – 15% | \$9.7 – \$12.6 | \$4.6 – \$6 | \$6.8 – \$8.8 | 63 – 82 | \$0.6 – \$0.7 |
| Cement/concrete
manufacturing | 5% – 15% | \$11.3 – \$14.6 | \$2 – \$2.6 | \$3.6 – \$4.7 | 26 – 33 | \$0.06 – \$0.09 |
| Accommodation | 5% – 15% | \$33.6 – \$50.4 | \$14.1 – \$21.1 | \$21 – \$31.5 | 299 – 449 | \$0.7 – \$1.1 |
| Amusement and theme parks | 5%-15% | \$23.4 – \$35.1 | \$9.9 – \$14.9 | \$15.3 – \$23 | 296 – 445 | \$0.9 – \$1.3 |
| Fitness and
Recreational Centers | 5%-15% | \$2.2 – \$3.4 | \$0.9 – \$1.4 | \$1.1 – \$1.7 | 43 – 64 | \$0.03 – \$0.06 |
| Tourism-supported retail | 5%-15% | \$37 – \$55.5 | \$15 – \$22.6 | \$22.3 – \$33.5 | 350 – 525 | \$2.0 – \$2.9 |
| UCSC | 15% – 25% | \$8.6 – \$18.6 | \$4.1 – \$8.9 | \$5.6 – \$12 | 128 – 277 | \$0.1 – \$0.2 |
| Golf courses | 25%-35% | \$8.6 - \$11.3 | \$4.5 – \$5.9 | \$4.7 – \$6.1 | 133 – 173 | \$0.1 - \$0.2 |
| North Coast
agriculture | 5%-15% | \$25.7 – \$38.5 | \$15.5 – \$23.3 | \$16.8 – \$25.2 | 293 – 440 | \$0.1 – \$0.2 |
| Total | | \$578.5 – \$789.9 | \$245.7 – \$337.3 | \$341.6 – \$467.8 | 5,752 – 7,902 | \$15.5 – \$21.1 |

Table E3. Range of negative economic impacts (losses) of Stage 5 water curtailments on included businesses by sector: City/Service Area

* Includes sub-county general and sub-county special districts (e.g., road maintenance, fire protection). ²²

Agenda Item 6.2.2.2

Note: this item is included in the MGA Board Meeting Packet (12/15/22) as an informational update regarding work conducted by the City of Santa Cruz Water Department. Aquifer Storage and Recovery (ASR) in Mid-County Groundwater Basin (MCGB)

Concept 1

Fact Sheet				
Description	Available winter flows from the City's surface water sources, treated at the Graham Hill Water Treatment Plant (GHWTP), would be injected into the Mid-County Groundwater Basin (MCGB) at four existing Beltz wells and four new wells, and recovered as a supplemental groundwater supply in dry summer periods. (Referred to as "Scenario 11.2" in prior ASR feasibility investigations and groundwater modeling efforts) ¹			
Water Source(s)	Average Injection: 1.7 MGD (920 AFY / 300 MGY) of potable city water supply ² Maximum Injection: 2.0 MGD (1,100 AFY / 360 MGY) of potable city water supply ²			
Project Yield	Average Extraction: 0.8 MGD (430 AFY / 140 MGY) of groundwater ³ Maximum Extraction: 3.0 MGD (1,630 AFY / 530 MGY) of groundwater ³			
	Evaluation Criteria ⁴			
Project's supply contribution as a % of worst year supply shortfall	60% ⁵			
Increases resilience to climate change	Yes, the project would utilize available capacity in the MCGB for storing winter flows, to be recovered through additional groundwater extraction during dry periods, thereby increasing resilience to drought and the impacts of climate change.			
Total Annualized Cost 6	Total Capital Cost: \$96.1 M Annualized Capital Cost: \$4.2 M O&M Annual Cost: \$2.7 M Total Unit Cost: \$4,200 – \$15,800 per AF (\$13,000 - \$48,300 per MG)			
Is understood and accepted by the public and key stakeholders	Yes, this alternative is understood and continues to be viewed favorably as a viable alternative to address water shortages.			
Scalable or can be implemented incrementally or in phases	Yes, ASR can and in fact should be implemented over time to ensure predicted outcomes. ASR is limited by groundwater basin capacity, surface water availability, and influence of the Pure Water Soquel (PWS) injection to the MCGB.			
Technical Feasibility	Yes. Ongoing pilot testing demonstrated technical feasibility.			
Likelihood project being funded by state or federal grants	Likely. Funding from the Bureau of Reclamation and State Water Resources Control Board (SWRCB) is available for construction of new wells.			
Opportunity for shared funding	No, the City does not have a project partner and would likely assume all costs.			
Greenhouse gas emissions	100 - 140 MT of carbon dioxide (CO ₂) emissions per year ⁷			
Time required for implementation	8 to 10 years for complete implementation of all ASR wells ⁸			
Operational Complexity	Low to Medium; would require minimal changes to current potable water supply operations, but increased effort for O&M of ASR wells.			
Energy Use	630,000 – 930,000 KWh/yr ⁹ 0.6 – 1.4 MWh/AF ⁹			
Potential impacts for CEQA required mitigations to impact project cost or timeliness	Low. Preliminary analysis indicates that the project would not have significant environmental impacts due to limited footprint of new facilities. The first phase of this project (conversion of existing Beltz Wells) was evaluated in the Water Rights EIR.			
Adaptable to future regulatory or source water changes	Yes, for regulatory changes, and ability to adapt to source water changes relies on treatment elsewhere; e.g., GHWTP process improvements. Prior to source water changes, geochemistry, travel time, and post-recovery water treatment needs will need to be revisited.			
Degree of administrative complexity	Low. The project is located within the City of Santa Cruz water service area with no need for partnerships with outside agencies.			

Concept 1

Aquifer Storage and Recovery (ASR) in Mid-County Groundwater Basin (MCGB)

Fact Sheet				
Evaluation Criteria (cont.) ⁴				
Ancillary Benefits	 Contributes to groundwater replenishment May assist in limiting seawater intrusion and meeting GSP objectives Adds to system supply portfolio Opportunity for regional collaboration 			
Ancillary Costs/Risks	 May mobilize constituents in basin Subject to leakage from groundwater basin, aka "losses" Sufficient cumulative storage may not be available in time of need Reliant on surface water availability 			
Assumptions	 Based on Scenario 11.2 and has not yet been modeled with the Pure Water Soquel project Pipelines sized for peak injection (2.0 MGD) and peak extraction (3.0 MGD) Injection period = 6-month (Nov – Apr) Extraction period = 6-month extraction (May – Oct) 			

NOTES:

¹ Scenario 11.2 was performed by Pueblo Water Resources and Montgomery & Associates in their Phase 1 ASR Feasibility Investigation groundwater modeling (Pueblo, 2021). This scenario uses 2016-18 demands (2.6 bgy), the GFDL2.1A2 climate change scenario, the four existing Beltz wells plus four new wells. Does not include utilization of native groundwater supplies.

² Average and Maximum daily injection rates used as modeled for Scenario 11.2 by Gary Fiske and Pueblo Water Resources (Pueblo 2021).

³ Average and Maximum annual extraction rates from Santa Cruz Water System Model results for ASR adaptation scenario under Realization 1270 (UMass, 2022).

⁴ Evaluation criteria listed in order of importance as ranked by Commissioners.

⁵ ASR Project can reduce the water supply shortage during the worst drought sequence projection, from 2,190 MG (cumulative shortage without adaptation project) to 870 MG (cumulative shortage with ASR project). Results for the water supply shortage are based on model results of the Santa Cruz Water Supply System Model for the worst drought sequence of 5 years, using Realization 1270, +2-degree Celsius warming, no change in average annual precipitation, and a change in climate variability coefficient of 1.1.

⁶ Costs are estimated at an AACE Class 5 level with -/+50% cost variation. Costs include conversion of 4 Beltz wells to ASR wells, 4 new ASR wells, modifications to wellhead treatment for Beltz 12 and wellhead treatment at new wells, upgrades to Beltz Water Treatment Plant, pilot testing, connections to/from water system, site acquisition, and additional facility costs. Costs also include markups, mobilization, contractor overhead, and a 30% estimate contingency. If additional new wells are required, infrastructure and treatment costs would be added accordingly. Escalation of 7% used due to current supply chain impacts and inflation. The cost estimates should be revisited when more design details are available. O&M costs are based on full production capacity. Unit costs are estimated for average production capacity (high end) and max production capacity (low end). Cost sources: Santa Cruz ASR Project - Phase 1 Feasibility Investigation; Summary of Groundwater Modeling Scenario 11.2 Results (Pueblo, 2021); Beltz Treatment Plant Rehabilitation Project (CDM, 2008); Beltz 12 Capital Asset Record Construction & Treatment Cost (City, 2015), and estimates from the City for Beltz 12 ammonia treatment costs (Dec, 2021).

⁷ Based on average emission rates for PG&E (2014-2018). Low emissions range based on energy use for an average extraction year, and high emissions range based on energy used for a max extraction year. PG&E increase in use of green energy sources in the future will reduce or eliminate GHG emissions. GHG emissions from pipelines represent 1-5% of the total emissions, with the rest being emissions due to energy use.

⁸ Based on estimates from the City and Pueblo Water Resources of 1.5 years for pilot testing existing wells, 3 years for pilot testing new wells, 1.5 years per well for upgrading existing wells, 2.5 years for developing new wells, and assuming 2 years of injection before commencing extraction. Estimates include property acquisition, permitting, design, contractor procurement and construction. To date pilot testing of wells Beltz 8 and 12 has been completed. The rest of the implementation for ASR wells will occur in phases.

⁹ Energy estimates for injection and extraction based on pumping information provided by the City. Energy for treatment based on estimate of energy use from Beltz Treatment Plant Rehabilitation Project (CDM, 2008). Low range is based on energy use for an average extraction year and high range is for energy used for a max extraction year. Unit energy estimated based on average and max AFY extraction rates.





Modified figure from "Santa Cruz ASR Project - Phase 1 Feasibility Investigation; Summary of Groundwater Modeling Scenario 11.2 Results (Pueblo, 2021)"

Concept 2 Indirect Potable Reuse (IPR) in Santa Margarita Groundwater Basin (SMGWB)

Fact Sheet				
Description	Expansion of treatment capacity of the Pure Water Soquel (PWS) Advanced Water Treatment Facility (AWTF) and conveyance of purified water to Scotts Valley for injection into the Santa Margarita Groundwater Basin (SMGWB). This concept would require a purchase agreement with Soquel Creek Water District (SqCWD).			
Water Source(s)	1.4 MGD (1,500 AFY / 510 MGY) of purified water ¹			
Project Yield	1.1 MGD (950 AFY / 310 MGY) extracted May – Oct (20% leave-behind to replenish SMGWB levels) ² 0.7 MGD (370 AFY /120 MGY) extracted Nov- Apr (50% leave-behind to replenish SMGWB levels) ²			
	Evaluation Criteria ³			
Project's supply contribution as a % of worst year supply shortfall	32% 4			
Increases resilience to climate change	Yes, the project would utilize available capacity in the SMGWB for storing purified water to be recovered as additional groundwater source during dry periods, increasing resilience to drought and the impacts of climate change.			
Total Annualized Cost ⁵	Total Capital Cost: \$239.7 Mil Annualized Capital Cost: \$11.4 Mil O&M Annual Cost: \$ 4.7 Mil Total Unit Cost: \$10,800 per AF (\$31,700 per MG)			
Is understood and accepted by the public and key stakeholders	Yes, this alternative is viewed somewhat favorably by the public as a way to address water shortages.			
Scalable or can be implemented incrementally or in phases	Yes, although limited by groundwater basin capacity and PWS AWTF expansion capacity unless additional AWTF capacity is added elsewhere.			
Technical Feasibility	Yes, groundwater replenishment reuse projects have been succesfully implemented in Southern California for over 50 years. Additional groundwater modeling and/or pilot testing may be required to demonstrate feasibility for the SMGWB.			
Likelihood project being funded by state or federal grants	Likely. Funding from the Bureau of Reclamation and SWRCB is available for water reuse projects.			
Opportunity for shared funding	Yes, Scotts Valley Water District could provide cost-share, and potentially other member agencies of the Santa Margarita Groundwater Agency (SMGWA)			
Greenhouse Gas Emissions	1,180 MT of CO ₂ emissions per year ⁶			
Time required for implementation	8 -10 years 7			
Operational complexity	High. The project would require coordination with multiple agencies to construct and operate the system and meet regulatory requirements.			
Energy Use	8,000,000 KWh/yr ⁸ 5.3 MHh/AF ⁸			
Potential impacts for CEQA required mitigations to impact project cost or timeliness	High. Short-term construction-related impacts could likely be mitigated through alternative construction techniques, preconstruction surveys, and implementation of best management practices.			
Adaptable to future regulatory or source water changes	Yes, beneficial to meet groundwater sustainability goals as well as potential opportunity to blend surface water could be considered.			
Degree of administrative complexity	High; due to multi-agency involvement and complex regulatory requirements.			

Concept 2 Indirect Potable Reuse (IPR) in Santa Margarita Groundwater Basin (SMGWB)

Fact Sheet				
Ancillary Benefits	 Source water supply not entirely reliant on surface water Contributes to groundwater replenishment May assist with compliance with GSP objectives Adds storage water to system supply portfolio Opportunity for regional collaboration Provides foundational treatment infrastructure for potential future consideration of DPR 			
Ancillary Costs/Risks	 May mobilize constituents in basin Subject to leakage from groundwater basin, aka "losses" Sufficient cumulative storage may not be available in time of need Public acceptance of purified recycled water may be limited 			
Assumptions	 Injection of 1,500 AFY Leave behind of 20% May – Oct, and 50% Nov to Apr to replenish the SMGWB Groundwater modeling required to confirm sustainable injection and extraction rates and well locations 			

NOTES:

¹ PWS project was designed to be able to expand production by an additional 1,500 AFY for a total project capacity of 3,000 AFY of purified water produced. PWS will inject 1,500 AFY of purified water into the MCGB.

² Annual extraction rates from Santa Cruz Water System Model results for IPR adaptation scenario under Realization 1270 (UMass, 2022). Assumed a 20% leave behind of the injected flows between May to October, increasing to 50% leave behind of the injected flows between November and April to replenish basin levels. SMGWB Groundwater Sustainability Plan (GSP) objective to restore groundwater levels require maintaining 710 AFY in the basin. The leave behind requirements would be updated in future phases of the work based on the requirements for the SMGWB.

³ Evaluation criteria listed in order of importance as ranked by Water Commissioners.

⁴ IPR Project can reduce the water supply shortage during the worst drought sequence projection, from 2,190 MG (cumulative shortage without adaptation project) to 1,480 MG (cumulative shortage with IPR project). Results for the water supply shortage are based on model results of the Santa Cruz Water Supply System Model for the worst drought sequence of 5 years, using Realization 1270, +2-degree Celsius warming, no change in average annual precipitation, and a change in climate variability coefficient of 1.1.

⁵ Costs are estimated at an AACE Class 5 level with -/+50% cost variation. Costs include expansion of PWS treatment capacity, conveyance to Scotts Valley, upgrading 2 wells for injection at El Pueblo, 7 new injection wells, 2 new extraction wells, conveyance of extracted water to Newell Creek pipeline connection, and additional facility costs. Costs also include markups, mobilization, contractor overhead, and a 30% estimate contingency. Escalation of 7% used due to current supply chain impacts and inflation. The cost estimates should be revisited often and when more design details are available. O&M costs and unit costs are based on full production capacity of 1,500 AFY. Cost sharing with SVWD is not accounted for. Costs based on Regional Recycled Water Alternatives Evaluation TM (KJ, 2021), escalated to 2022.

⁶ Based on average emission rates for PG&E (2014-2018). PG&E increase in use of green energy sources in the future will reduce or eliminate GHG emissions. GHG emissions from pipelines represent 1-5% of the total emissions, with the rest being emissions due to energy use.

⁷ Timeline for implementation includes permitting, environmental review, design, bidding, construction, and commissioning.

⁸ Energy estimates for treatment and conveyance. Energy estimates are based on total project capacity, not including variations due to seasonal operations.

Figure 1 - Concept 2 - IPR in the SMGWB



Note: Service laterals to individual meters are not shown

151 of 158

Concept 3 Direct Potable Reuse (DPR) via Raw Water Augmentation

Fact Sheet				
Description	Develop a new AWTF to treat effluent from the Santa Cruz WWTF and produce purifed water to be blended with raw surface water prior to additional treatment at the GHWTP.			
Water Source(s)	4.2 MGD (4,670 AFY/ 1,520 MGY) of Santa Cruz WWTF effluent ¹			
Project Yield	3 MGD (2,700 AFY/ 880 MGY) of purified water production capacity ² 1 MGD produced Nov to April and 2 MGD produced May to October 3 MGD produced when Loch Lomond reservoir levels are below 2.0 billion gallons.			
	Evaluation Criteria ³			
Project's supply contribution as a % of worst year supply shortfall	87% 4			
Increases resilience to climate change	Yes, although wastewater flows are linked to customer demands, this project would provide a consistent supply of locally produced, purified water to directly supplement the City's potable water system, increasing resilience to drought and the impacts of climate change.			
Total Annualized Cost ⁵	Total Capital Cost: \$163.2 Mil Annualized Capital Cost: \$6.6 Mil O&M Annual Cost: \$ 5.0 Mil Total Unit Cost: \$4,300 per AF (\$13,200 per MG)			
Is understood and accepted by the public and key stakeholders	Yes, this project type is generally understood by the public and key stakeholders; however, additional information would be needed about local understanding and acceptance of this form of water reuse.			
Scalable or can be implemented incrementally or in phases	Yes, initial assessments show that the City has adequate source supply and can produce purified water incrementally to fill the water supply gap. Updated source supply assessment is needed.			
Technical Feasibility	Yes. The existing and proven treatment technologies are available to meet the proposed criteria and anticipated regulatory requirements for DPR.			
Likelihood project being funded by state or federal grants	Likely. Funding from the Bureau of Reclamation and SWRCB is currently available for water reuse and demonstration projects, and additional future funding will likley be made available for DPR once regulations are finalized.			
Opportunity for shared funding	No, the City does not have a project partner identified and would likely assume all costs; however, future purchase agreement(s) may present an opportunity for water transfers and exchanges.			
Greenhouse Gas Emissions	870 MT of CO ₂ emissions per year ⁶			
Operational complexity	High. This project would require operation of a new AWTF and meeting complex regulatory requirements, which are still in development.			
Time required for implementation	More than 10 years. ⁷			
Energy Use	6,100,000 KWh/yr ⁸ 1.8 MWh/AF ⁸			
Potential impacts for CEQA required mitigations to impact project cost or timeliness	High. Short-term construction-related impacts could likely be mitigated through alternative construction techniques, preconstruction surveys and implementation of best management practices.			
Adaptable to future regulatory or source water changes	Uncertain and may depend on adopted regulations by the SWRCB Division of Drinking Water, expected by December 2023. Potential opportunities to treat seawater, brackish water, or impaired groundwater at the AWTF could be considered.			
Degree of administrative complexity	High due to complex regulatory requirements.			

	Concept 3 Direct Potable Reuse (DPR) via Raw Water Augmentation			
Fact Sheet				
Evaluation Criteria (cont.) ³				
Ancillary Benefits	 Independent source from surface water although linked to water use Relatively cost-effective compared to \$/AF of other alternatives 			
Ancillary Costs/Risks	 Public acceptance of purified recycled water may be limited, especially for DPR State regulations not yet in place (pending, anticipated December 2023) 			
Assumptions	 New AWTF located near the Santa Cruz WWTF Treatment train based on draft DPR criteria but does not include nitrification of City effluent. 			

NOTES:

¹ Wastewater availability will be further evaluated to refine sizing of DPR project based on effluent available from the Santa Cruz WWTF for production of purified water, with consideration of effluent required for the Pure Water Soquel project needs.

² For modeling this alternative in the Santa Cruz Water Supply System Model, assumed 1MGD production November to April and 2 MGD production May to October. Assumed increased production of 3 MGD when levels at Loch Lomond reservoir are below 2.0 billion gallons and until reservoir levels reach 2.8 billion gallons.

³ Evaluation criteria listed in order of importance as ranked by Commissioners.

⁴ DPR Project can reduce the water supply shortage during the worst drought sequence projection, from 2,190 MG (cumulative shortage without adaptation project) to 280 MG (cumulative shortage with DPR project). Results for the water supply shortage are based on model results of the Santa Cruz Water Supply System Model for the worst drought sequence of 5 years, using Realization 1270, +2-degree Celsius warming, no change in average annual precipitation, and a change in climate variability coefficient of 1.1.

⁵ Costs are estimated at an AACE Class 5 level with -/+50% cost variation. Costs include new AWTF, conveyance to raw water blending station, and additional facility costs. Costs also include markups, mobilization, contractor overhead, and a 30% estimate contingency. Costs based on Recycled Water Facilities Planning Study RWFPS (KJ, 2018), escalated to 2022. Escalation of 7% used due to current supply chain impacts and inflation. The cost estimates should be revisited when more design details are available. O&M costs and unit costs are based on full production capacity.

⁶ Based on average emission rates for PG&E (2014-2018). PG&E increase in use of green energy sources in the future will reduce or eliminate GHG emissions. GHG emissions from pipelines represent 1-5% of the total emissions, with the rest being emissions due to energy use.

⁷ Timeline for implementation includes permitting, environmental review, design, bidding, construction, and commissioning.

⁸ Energy estimates for treatment and conveyance, based on RWFPS (KJ, 2018). Energy estimates are based on total project capacity, not including variations due to seasonal operations.

Figure 2 - Concept 3 - DPR with Raw Water Augmentation



154 of 158

Concept 4 Seawater Desalination

Fact Sheet				
Description Construct a new, local seawater desalination facility and ocean intake (3 option				
Water Source(s)	6 MGD (5,400 AFY / 1,760 MGY) of seawater from Monterey Bay 1			
Project Yield	3 MGD (2,700 AFY/ 880 MGY) of desalinated water production capacity. 1 MGD produced Nov to April and 2 MGD produced May to October 3 MGD produced when Loch Lomond reservoir levels are below 2.0 billion gallons ²			
	Evaluation Criteria ³			
Project's supply contribution as a % of worst year supply shortfall	87% 4			
Increases resilience to climate change	Yes. Project would provide a consistent supply of locally produced potable water to directly supplement the City's potable water system, increasing resilience to drought and the impacts of climate change. The location of the seawater desalination facility would consider sea-level rise.			
Total Annualized Cost 5	Total Capital Cost: \$290.6 - \$443.9 Mil Annualized Capital Cost: \$13.0 - \$23.9 Mil O&M Annual Cost: \$ 6.8 - \$7.1 Mil Total Unit Cost: \$7,400 - \$11,500 per AF (\$22,700 - \$35,300 per MG)			
Is understood and accepted by the public and key stakeholders	This project is generally understood by the public and key stakeholders. While desalination is recognized as a potential supply alternative, broad acceptance is unknown.			
Scalable or can be implemented incrementally or in phases	Yes. The desalination plant could be designed to be scalable to incrementally fill the water supply gap.			
Technical Feasibility	Yes. Although challenging to permit, desalination is technically feasible as demonstrated by projects implemented in the state of California and elsewhere.			
Likelihood project being funded by state or federal grants	Likely. Funding from the Bureau of Reclamation is available for desalination projects that have an approved Title XVI feasibility study. Additional future funding from the SWRCB could be available if drought persists.			
Opportunity for shared funding	No, the City has not identified a project partner and would therefore likely assume all costs; however future purchase agreement(s) may present an opportunity for water transfers and exchanges.			
Greenhouse Gas Emissions	2,500 MT of CO2 emissions per year 6			
Time required for implementation	More than 10 years. 7			
Operational complexity	High. Would require operation of a new desalination facility; balancing cost to operate versus ramping down or shutting down the plant in favor of less costly supplies.			
Energy Use	17,500,000 KWh/yr ⁸ 4.7 MWh/AF ⁷			
Potential impacts for CEQA required mitigations to impact project cost or timeliness	High. In addition to short-term mitigations, desalination projects may result in additional required mitigations to protect marine life in Monterey Bay and the complex permitting process would impact timeline for construction.			
Adaptable to future regulatory or source water changes	Potentially. Although no current example exists in California, ocean water could potentially be blended with effluent from the Santa Cruz WWTF at the desalination plant to produced purified water to augment the potable water system; or the desalination plant could be converted to a DPR facility once DPR regulations are finalized.			
Degree of administrative complexity	High, due to complexity of regulations and permitting requirements.			

Concept 4 Seawater Desalination

Fact Sheet			
Evaluation Criteria (cont.) ³			
Ancillary Benefits	 Reliable source water Independent from surface sources Potentially expandable if/as future needs arise 		
 Ancillary Costs/Risks Regulatory permitting timeline and feasibility is uncertain Public acceptance of seawater desalination locally is uncertain 			
Assumptions	Desalination treatment recovery of 50% (50% reject through membranes).		

NOTES:

¹ Estimated assuming 50% recovery through desalination treatment process.

² For modeling this alternative in the Santa Cruz Water Supply System Model, assumed 1 MGD production November to April and 2 MGD production May to October. Assumed increased production of 3 MGD when levels at Loch Lomond reservoir are below 2.0 billion gallons and until reservoir levels reach 2.8 billion gallons.

³ Evaluation criteria listed in order of importance as ranked by Water Commissioners.

⁴ Desalination Project can reduce the water supply shortage during the worst drought sequence projection, from 2,190 MG (cumulative shortage without adaptation project) to 280 MG (cumulative shortage with Desalination project). Results for the water supply shortage are based on model results of the Santa Cruz Water Supply System Model for the worst drought sequence of 5 years, using Realization 1270, +2-degree Celsius warming, no change in average annual precipitation, and a change in climate variability coefficient of 1.1.

⁵ Costs are estimated at an AACE Class 5 level with -/+50% cost variation. Cost range is based on 3 different Alternatives for ocean intake, SI-1, SI-2, and SI-3, per Desalination Feasibility Study by Dudek (August 2018). Costs were escalated to 2022 costs. Escalation of 7% used due to current supply chain impacts and inflation. The cost estimates should be revisited when more design details are available. O&M costs and unit costs are based on full production capacity.

⁶ Based on average emission rates for PG&E (2014-2018). PG&E increase in use of green energy sources in the future will reduce or eliminate GHG emissions. GHG emissions from pipelines represent 1-5% of the total emissions, with the rest being emissions due to energy use.

⁷ Timeline for implementation includes permitting, environmental review, design, bidding, construction, and commissioning.

⁸ Energy estimates based on SCWD Regional Desalination Plant Phase I Preliminary Design Report-Volume 1 Draft Report (2012, CDM Smith). Unit energy estimated based on volume of water treated. Energy estimates are based on total project capacity, not including variations due to seasonal operations.



FIGURE 4

DUDEK & 75D 1,500 Updated Seawater Desalination Project Overview

City of Santa Cruz Seawater Desalination Project

157 of 158

December 15, 2022

MEMO TO THE MGA BOARD OF DIRECTORS

Subject: Agenda Item 6.3

Title: Annual Status Report on Board FPPC Compliance (Required by First Amended Bylaws Section 10.2)

MGA BOARD AND EXECUTIVE TEAM ETHICS COMPLIANCE 2022				
	Form 700	AB 1234		Ethics Code
	Annual Filing	Ethics Training		SqCWD Ethics Policy
	2021	Current	Due	Date Provided
Board Members				
Curt Abramson	3/30/2022	2/25/2021	2/25/2023	4/13/2021
David Baskin	3/9/2022	8/12/2022	8/12/2024	n/a
Zach Friend	3/16/2022	2/2/2021	2/2/2023	n/a
Bruce Jaffe	3/31/2022	2/2/2021	2/2/2023	n/a
Jon Kennedy	2/10/2022	2/2/2021	2/2/2023	4/13/2021
Jim Kerr	2/15/2022	2/2/2021	2/2/2023	4/13/2021
Manu Koenig	3/30/2022	2/18/2021	2/18/2023	n/a
Tom LaHue	2/15/2022	2/2/2021	2/2/2023	n/a
Robert Marani	3/23/2022	7/7/2022	7/7/2024	n/a
Donna Meyers	3/31/2022	2/4/2021	2/4/2023	n/a
Marco Romanini	2/23/2022	2/2/2021	2/2/2023	n/a
Alternates				
John Benich	3/23/2022	2/2/2021	2/2/2023	n/a
Rachel Lather	3/8/2022	2/2/2021	2/2/2023	n/a
Doug Engfer	1/26/2022	4/11/2022	4/11/2024	n/a
Robert Schultz	3/31/2022	2/2/2021	2/2/2023	4/13/2021
Allyson Violante	3/30/2022	6/14/2021	6/14/2023	n/a

Submitted by Tim Carson

Program Director Regional Water Management Foundation