TRUCKEE MEADOWS WATER AUTHORITY
Board of Directors

REVISED AGENDA

Wednesday, October 16, 2019 at 10:00 a.m.
NEW VENUE: TMWA Corporate, 1355 Capital Blvd., Reno, NV

Board Members

Chair Vaughn Hartung
Vice Chair Kristopher Dahir
Member Neoma Jardon
Member Jeanne Herman
Member Jenny Brekhus
Member Naomi Duerr
Member Paul Anderson

NOTES:

1. The announcement of this meeting has been posted at the following locations: Truckee Meadows Water Authority (1355 Capital Blvd., Reno), Reno City Hall (1 E. First St., Reno), Sparks City Hall (431 Prater Way, Sparks), Sparks Justice Court (1675 E. Prater Way, Sparks), Washoe County Courthouse (75 Court St., Reno), Washoe County Central Library (301 South Center St., Reno), Washoe County Administration (1001 East Ninth St., Reno), at http://www.tmwa.com, and State of Nevada Public Notice Website, https://notice.nv.gov/.

2. In accordance with NRS 241.020, this agenda closes three working days prior to the meeting. We are pleased to make reasonable accommodations for persons who are disabled and wish to attend meetings. If you require special arrangements for the meeting, please call (775) 834-8002 at least 24 hours before the meeting date.

3. Staff reports and supporting material for the meeting are available at TMWA and on the TMWA website at http://www.tmwa.com/meeting/ or you can contact Sonia Folsom at (775) 834-8002. Supporting material is made available to the general public in accordance with NRS 241.020(6).

4. The Board may elect to combine agenda items, consider agenda items out of order, remove agenda items, or delay discussion on agenda items. Arrive at the meeting at the posted time to hear item(s) of interest.

5. Asterisks (*) denote non-action items.

6. Public comment is limited to three minutes and is allowed during the public comment periods. The public may sign-up to speak during the public comment period or on a specific agenda item by completing a "Request to Speak" card and submitting it to the clerk. In addition to the public comment periods, the Chairman has the discretion to allow public comment on any agenda item, including any item on which action is to be taken.

7. In the event the Chairman and Vice-Chairman are absent, the remaining Board members may elect a temporary presiding officer to preside over the meeting until the Chairman or Vice-Chairman are present (**Standing Item of Possible Action**).

8. Notice of possible quorum of Western Regional Water Commission: Because several members of the Truckee Meadows Water Authority Board of Directors are also Trustees of the Western Regional Water Commission, it is possible that a quorum of the Western Regional Water Commission may be present, however, such members will not deliberate or take action at this meeting in their capacity as Trustees of the Western Regional Water Commission.

1. Roll call*

2. Pledge of allegiance*

3. Public comment — limited to no more than three minutes per speaker*

4. Approval of the agenda **(For Possible Action)**

5. Approval of the minutes of the September 18, 2019 meeting of the TMWA Board of Directors **(For Possible Action)**

[1] The Board may adjourn from the public meeting at any time during the agenda to receive information and conduct labor-oriented discussions in accordance with NRS 288.220 or receive information from legal counsel regarding potential or existing litigation and to deliberate toward a decision on such matters related to litigation or potential litigation.

6. Presentation of TMWA's Fiscal Year 2019 Customer Satisfaction Study — Sara Hart, Director of Research, Infosearch International*

7. Required communication from Eide Bailly in regards to TMWA's annual financial audit — Michele Sullivan*

8. Discussion and action, and possible direction to staff regarding the approval of agreement with Washoe County to utilize funds of up to $286,937 of remaining Washoe County AB9-SQ1 funds for the One Truckee River Restroom Project— John Enloe **(For Possible Action)**

9. Discussion and action, and possible direction to staff regarding approval of the Interlocal Agreement between the Truckee Meadows Water Authority and the City of Reno for providing a sanitary restroom facility on the City's Brodhead Park property for use by the public — John Enloe **(For Possible Action)**

10. Presentation of analysis of TMWA Rule 7 water demand estimates and discussion and possible action and direction to staff on potential future changes to Rule 7 demand estimates — John Zimmerman and Laine Christman **(For Possible Action)**

11. Reconsideration of Board action on Agenda Item No. 10 from the from the September 18, 2019 meeting of the TMWA Board of Directors and discussion and possible direction to staff regarding parameters for the sale of the Farad Property — Mark Foree **(For Possible Action)**

12. Reconsideration of Board action on Agenda Item No. 9 from the September 18, 2019 meeting of the TMWA Board of Directors: Public Hearing, consideration of written bids and consideration of possible oral bids for sale of Farad property and discussion and possible action regarding approval of sale or other disposition of Farad property consisting of approximately 111 acres in Nevada County, California generally referred to as Assessor's Parcels 48-030-14, 48-050-01, 48-050-10, 48-060-07, 48-040-02 and 48-130-04 — Mark Foree **(For Possible Action)**

13. Public Hearing, consideration of written bids and consideration of possible oral bids for sale of Farad property and discussion and possible action regarding approval of sale or other disposition of Farad property consisting of approximately 111 acres in Nevada County, California generally referred to as Assessor's Parcels 48-030-14, 48-050-01, 48-050-10, 48-060-07, 48-040-02 and 48-130-04 — John Zimmerman and Pat Nielson **(For Possible Action)**

14. Presentation of and discussion, and possible direction to staff regarding preliminary funding plan for Fiscal Years 2020 through 2024 — Michele Sullivan **(For Possible Action)**

15. Presentation of TMWA Goals and Objectives results for Fiscal Year 2019 — Mark Foree*

16. Discussion and action, and possible direction to staff on the proposed TMWA Goals and Objectives for Fiscal Year 2020 — Mark Foree **(For Possible Action)**

17. General Manager's Report*

18. Public comment — limited to no more than three minutes per speaker*

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19. Board comments and requests for future agenda items*

20. Adjournment **(For Possible Action)**

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TRUCKEE MEADOWS WATER AUTHORITY
MINUTES OF THE SEPTEMBER 18, 2019
DRAFT MEETING OF THE BOARD OF DIRECTORS

The Board of Directors met on Wednesday, September 18, 2019, at Sparks Council Chambers., 745 4th Street, Sparks, Nevada. Vice Chair Dahir called the meeting to order at 10:00 a.m.

1. ROLL CALL

Members Present: Paul Anderson, Jenny Brekhus, Kristopher Dahir, Naomi Duerr, Jeanne Herman, and *Alternate Devon Reese.

Members Absent: Neoma Jardon and Vaughn Hartung.

A quorum was present.

**Alternate Reese left at 11:07a.m.*

2. PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Andy Gebhardt, TMWA Director of Operations & Water Quality.

3. PUBLIC COMMENT

There was no public comment.

4. APPROVAL OF THE AGENDA

Upon motion by Member Duerr second by Member Herman, which motion duly carried by unanimous consent of the members present, the Board approved the agenda.

5. APPROVAL OF THE MINUTES OF THE AUGUST 15, 2019 WATER RESOURCE PLAN WORKSHOP MEETING

Upon motion by Member Duerr, second by Member Brekhus, which motion duly carried by unanimous consent of the members present, the Board approved the August 15, 2019 Water Resources Plan Workshop minutes.

6. APPROVAL OF THE MINUTES OF THE AUGUST 21, 2019 MEETING

Upon motion by Member Anderson, second by Member Brekhus, which motion duly carried by unanimous consent of the members present, the Board approved the August 21, 2019 minutes.

7. DISCUSSION AND ACTION ON ESTABLISHING A LEGISLATIVE SUBCOMMITTEE FOR THE 2019-2020 INTERIM LEGISLATIVE SESSION AND APPOINTMENT OF BOARD MEMBERS TO SUBCOMMITTEE

John Zimmerman, TMWA Water Resources Manager, informed the Board that there will be bills that will be discussed during the interim that staff would like to monitor, and as the Board directed, to be more engaged with legislators. As such, staff is recommending establishing a legislative sub-committee for the 2019-2020 interim legislative session.

Upon motion by Member Reese, second by Member Duerr, which motion duly carried by unanimous consent of the members present, the Board approved establishing a legislative subcommittee for the 2019-2020 interim legislative session and appointed Vaughn Hartung, Kristopher Dahir and Naomi Duerr as members, and Jeanne Herman as the alternate.

8. PRESENTATION OF PRELIMINARY FISCAL YEAR 2019 UNAUDITED FINANCIAL PERFORMANCE

Matt Bowman, TMWA Financial Controller, presented the preliminary findings and reported there were no major surprises in fiscal year 2019. Operating revenue was consistent with budget ($0.2m higher due to $0.8m more in water sales); investment earnings better than budget ($4.4m variance from budget of $2.8m); capital contributions were $25.5m higher than the budget of $16.7m due to non-cash developer infrastructure contributions (approximately $19.1m); record hydro earnings in August 2019 after Fleish hydropower plant closed for much of FY 2019 due to work on the flume; higher water sales, $6.3m due to the 3% rate increase in May 2018; total operating expenses were $0.9m less than budget; salaries and wages increased to do increase in head count (7% head count increase in preparation for 22 expected retirements occurring over the 3-5 years) and step increases; employee benefits are lower related to Governmental Accounting Standards Board (GASB) changes in Other Post-Employment Benefit (OPEB) and pensions in FY 2018; non-operating expenses were down $4.1m from budget due to higher investment earnings; and cash position is $197.8m ($152.9m unrestricted cash and $44.9m restricted cash to pay for scheduled bond principal and interest payments).

Board members inquired what TMWA does with the hydro generated power and if TMWA generates more than it uses. Staff advised that TMWA is under contract to sell the power to NV Energy and currently TMWA uses more than it produces. Board members inquired how much was left in the commercial paper program (there is approximately $23m and expect to pay $5m per year until fully paid); and where the

increased developer rates are indicated (the new developer rates are not indicated in this report, but would see it in developer contributions).

9. PUBLIC HEARING, CONSIDERATION OF WRITTEN BIDS AND CONSIDERATION OF POSSIBLE ORAL BIDS FOR SALE OF FARAD PROPERTY AND DISCUSSION AND POSSIBLE ACTION REGARDING APPROVAL OF SALE OR OTHER DISPOSITION OF FARAD PROPERTY CONSISTING OF APPROXIMATELY 111 ACRES IN NEVADA COUNTY, CALIFORNIA GENERALLY REFERRED TO AS ASSESSOR'S PARCELS 48-030-14, 48-050-01, 48-050-10, 48-060-07, 48-040-02 AND 48-130-04

Mr. Zimmerman and Pat Nielson, TMWA Director of Distribution, Maintenance and Generation, presented on this item. Mr. Zimmerman stated the Board rejected all bids at the last Board meeting, the highest of which was $63k by Bill Black. Since the last meeting, Mr. Black has submitted a bid of $127,500 and staff proceeded to re-notice the sale hearing to allow the Board to consider the bid today. As of today, no one other than Mr. Black has submitted a bid.

Vice Chair Dahir confirmed with Michael Pagni, TMWA General Counsel, due process for the public hearing. Mr. Pagni replied the next step would be to open to the public for auction and if no one came forward, to close the public hearing and the Board could discuss the written offer before them.

Member Duerr asked what the process would be if they rejected the bid since she has been contacted by conservation groups. Mr. Pagni replied the next steps would be to go to agenda item #10 under which item the Board could discuss other options. Member Brekhus added that, since no one has come forward, opportunity should be given to entities in California to make a claim. Mr. Nielson added that staff has had discussions with these groups.

Public Hearing

Vice Chair Dahir asked if there was anyone in the audience interested in submitting a bid.

No one from the public expressed interest in submitting an oral bid.

Closed Public Hearing

Public Comment

Janet Phillips, Tahoe-Pyramid Trail, thanked the Board for granting the easement for the trail going through the Farad property. She stated that California is interested in the other side of Donner Summit. Ms. Phillips stated she has spoken with a number of conservation organizations that are interested in the property, but are afraid of possible contaminants in the area that TMWA could assist in providing information. She is optimistic that there is room to get the property in recreational mode, and believes there is minimal liability to TMWA and suggested that TMWA keep the property as there are numerous utilities that own property for recreational purposes.

Close Public Comment

Mr. Zimmerman stated Mr. Black has offered $127,500 (more than double his original offer at the August Board meeting) to purchase the property as is under the same terms of the written purchase agreement previously considered.

Discussion ensued on the purchase proposal. The Board confirmed staff had not conducted an environmental examination of the property. Board members suggested staff consider grants that are given to utilities to provide recreational opportunities on otherwise unusable land. Board members commented that the Board should trust staff, who have gone to great lengths to advertise the sale of the property and recommended selling due to inability to rehabilitate the Farad hydro facility and the liability associated with the property. Discussion continued on the possibility to reconsider selling to a conservation agency (Staff indicated Truckee Donner Land Trust has expressed interest but not at this time and they are concerned about liability), and whether the community would benefit by returning it to the private sector as it would generate funds through taxes and it would no longer be TMWA's responsibility.

Member Anderson made a motion, second by Member Herman, to approve the sale of the Farad property consisting of approximately 111 acres in Nevada County, California generally referred to as Assessor's Parcels 48-030-14, 48-050-01, 48-050-10, 48-060-07, 48-040-02 and 48-130-04 to Bill Black for $127,500 as recommended. The motion failed to pass by a tie vote of three in favor (Anderson, Herman, and Dahir) and three opposed (Brekhus, Duerr and Reese).

10. DISCUSSION AND POSSIBLE DIRECTION TO STAFF REGARDING PARAMETERS FOR THE SALE OF THE FARAD PROPERTY

The Board discussed other options with respect to the sale of the Farad property. Some Board members expressed the importance of keeping the Farad property under public ownership and an indication of how the Board and TMWA operates, citing TMWA's role in the Portland Loo and bathroom facilities in order to protect the water supply. Other Board members suggested listing the property in a different way (through a realtor) to see potential buyers, noting the strong financial position of TMWA allows time to garner interest from buyers and users of the river to manage the property. Comments were made that the Board should consider the potential liability of retaining the property. The Board directed staff to go with a commercial broker that has expertise with conservation organizations and is licensed in California and reach out to organizations that may be interested with an offer that would be acceptable to the Board; and for staff to have the property listed for a period of up to six months and return to the Board during or after that period of time with offers that the Board may consider.

Upon motion by Member Anderson, second by Member Brekhus, which motion duly carried by unanimous consent of the members present, the Board directed staff to obtain the services of a commercial realtor and list

the Farad property for sale, and return to the Board in approximately six months for an update if no offers are received.

11. DISCUSSION AND ACTION ON RESOLUTION NO. 279: A RESOLUTION TO APPROVE FUNDING FOR THE PROJECTS RECOMMENDED BY THE TRUCKEE RIVER FUND ADVISORY COMMITTEE AND AN AUTHORIZATION FOR THE COMMUNITY FOUNDATION TO FUND SUCH PROJECTS FROM FUND PROCEEDS

John Enloe, TMWA Director of Natural Resources & Planning, presented the six projects for funding request of $537,599 for Board approval.

The Board discussed setting the criteria for the next proposal cycle to help address the homeless issue along the river (several One Truckee River efforts are targeted for this purpose); having staff provide a summary report and to schedule a tour (the summary report will be provided when the calendar year report is presented and a tour can be scheduled with project recipients); and understand the river has many complicated issues and acknowledged TMWA efforts.

Upon motion by Member Duerr, second by Member Brekhus, which motion duly carried by unanimous consent of the members present, the Board adopted Resolution No. 279: A Resolution to approve funding for the projects recommended by the Truckee River Fund Advisory Committee and an authorization for the Community Foundation to fund such projects from Fund proceeds.

12. PRESENTATION REGARDING OPERATIONAL READINESS FOR FIRE EMERGENCIES

Mr. Gebhardt informed the Board that due to the tragic fires in California and 162 square miles of service territory, TMWA staff is trained and ready to provide water for fire fighters and work in collaboration with regional agencies, including local hospitals.

13. DISCUSSION AND ACTION REGARDING GENERAL MANAGER PERFORMANCE REVIEW FOR CONTRACT YEAR 2018/2019 AND DISCUSSION AND ACTION ON POSSIBLE LUMP SUM AWARD AND/OR OTHER COMPENSATION ADJUSTMENT

Jessica Atkinson, TMWA Human Resources Manager, presented the staff report. Ms. Atkinson recapped that at the September 2018 meeting the Board approved extending the contract term with a stepped increase to the general manager's base salary towards market (which at the time was 13% below the 60th percentile) through an increase in 2018 and automatic adjustment on July 1, 2019 to the "market" step of the general manager wage band of 7.4% (bringing the salary within 1% of the 60th percentile). The Board

could consider an additional increase or lump sum award, provided the total award and 2019 adjustment cannot exceed 10% of his base salary. Mr. Pagni affirmed with the new contract in 2018 there was an initial increase to bring the general manager's salary to the market wage band, Step 5, and automatic annual increases to the "market" step (top step of the wage band) for the duration of the contract term which was adopted for the purpose of facilitating succession planning stability.

Discussion followed regarding additional compensation adjustment and/or lump sum (that range being $0 to $5,285) be given to Mr. Foree for such an exceptional job and recognition of an outstanding performance review; the Board is in a position to show future potential applicants that they take care of the general manager in order to secure qualified candidates; not consider giving a bonus as that is considered something done only in the private sector; the general manager goes through the same salary adjustment process as the Management, Professional, Technical and Administrative (MPATs) employees, and would receive an automatic 2.5% salary increase along with other MPATs; the general manager's salary fell so far below the market value due to where Mr. Foree began, how the market moved and not keeping up with the market; and consideration of giving a lump sum this year, but to continue looking at providing percentage in the future to recognize the great work.

Mr. Foree said he was grateful with the support of the Board over the years, and thanked his great team and staff since it wouldn't be possible without them.

Upon motion by Member Anderson, second by Member Herman, which motion duly carried by unanimous consent of the members present, the Board approved the General Manager performance review for contract year 2018/2019 and lump sum award of $5,285.

14. DISCUSSION AND ACTION ON REQUEST FOR BOARD INPUT AND ACCEPTANCE OF GENERAL MANAGER PERFORMANCE OBJECTIVES FOR CONTRACT YEAR 2019/2020

Mr. Foree presented TMWA's FY2020 proposed goals and objectives.

Member Duerr emphasized the need for the injection program at Bedell Flat and American Flat begin sooner than the five years staff estimation; requested staff to consider alternative solutions that would reduce impediments along the river and more collaboration with other regional agencies; complimented staff on the new approach to the update to the Water Resource Plan; and that she is pleased with the progress TMWA in taking a lead policy role in the region.

Member Brekhus agreed with Member Duerr's comments and requested consideration in evaluating the rate structure for service of effluent water.

Vice Chair Dahir expressed his appreciation in TMWA participating with local entities in the Blue Ribbon Data digital plan review initiative.

Upon motion by Member Duerr, second by Member Anderson, which motion duly carried by unanimous consent of the members present, the

Board approved the General Manager performance objectives for contract year 2019/2020.

15. GENERAL MANAGER'S REPORT

Mr. Foree reported TMWA received a credit upgrade from Fitch ratings, on the commercial paper program, from A+ to AA-, affirmed our 2015 bond refunding to A+, and changed the rating outlook from stable to positive.

16. PUBLIC COMMENT

There was no public comment.

17. BOARD COMMENTS AND REQUESTS FOR FUTURE AGENDA ITEMS

Member Brekhus requested staff to revisit the Truckee River Fund priorities before the spring request for proposals (RFP) is released; and to have staff present the rate structure into the context of household costs.

Vice Chair Dahir agreed and would like to have staff present what the plan is with collaborating agencies with regards to the spring RFP.

Member Duerr stated it was quite a shock on the developers when the connection fees increased and would like to discuss the possibility of it increasing slightly each year such as a consumer price index (CPI).

18. ADJOURNMENT

With no further discussion, Vice Chair Dahir adjourned the meeting at 11:44 a.m.

Approved by the TMWA Board of Directors in session on _____.

Sonia Folsom, Board Clerk.

Alternate Reese was present for agenda items 1 thru 11 only.

TRUCKEE MEADOWS WATER AUTHORITY

Quality. Delivered.

Customer Satisfaction Study Fiscal Year 2019

InfoSearch™

Survey Purpose & Methodology
Fiscal Year 2019

Purpose:

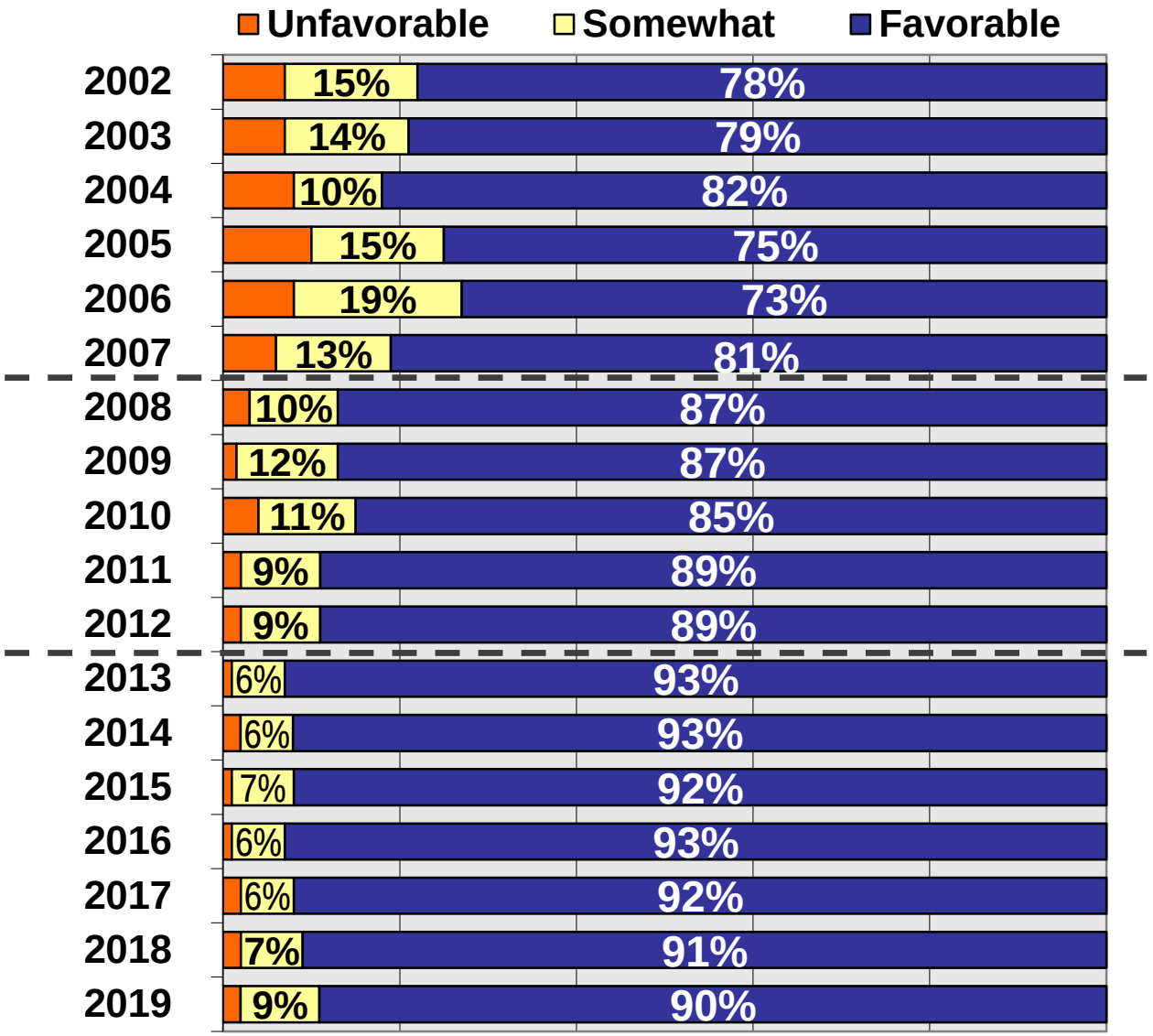
- To assess TMWA customers' overall level of satisfaction and attitudes toward water-related issues including quality, sufficiency, and security
- To identify significant differences between customer groups
- To identify trends since 2002 with 18 annual studies to date

2019 Methodology:

- Telephone surveys managed by InfoSearch International
- In the field from July 2018 to June 2019; interviews averaged 8-10 minutes
- Sample of **500**: 400 Residential and 100 Commercial Customers
- Total sample, at 95% confidence level, ± 4.4% confidence interval

Overall Customer Satisfaction

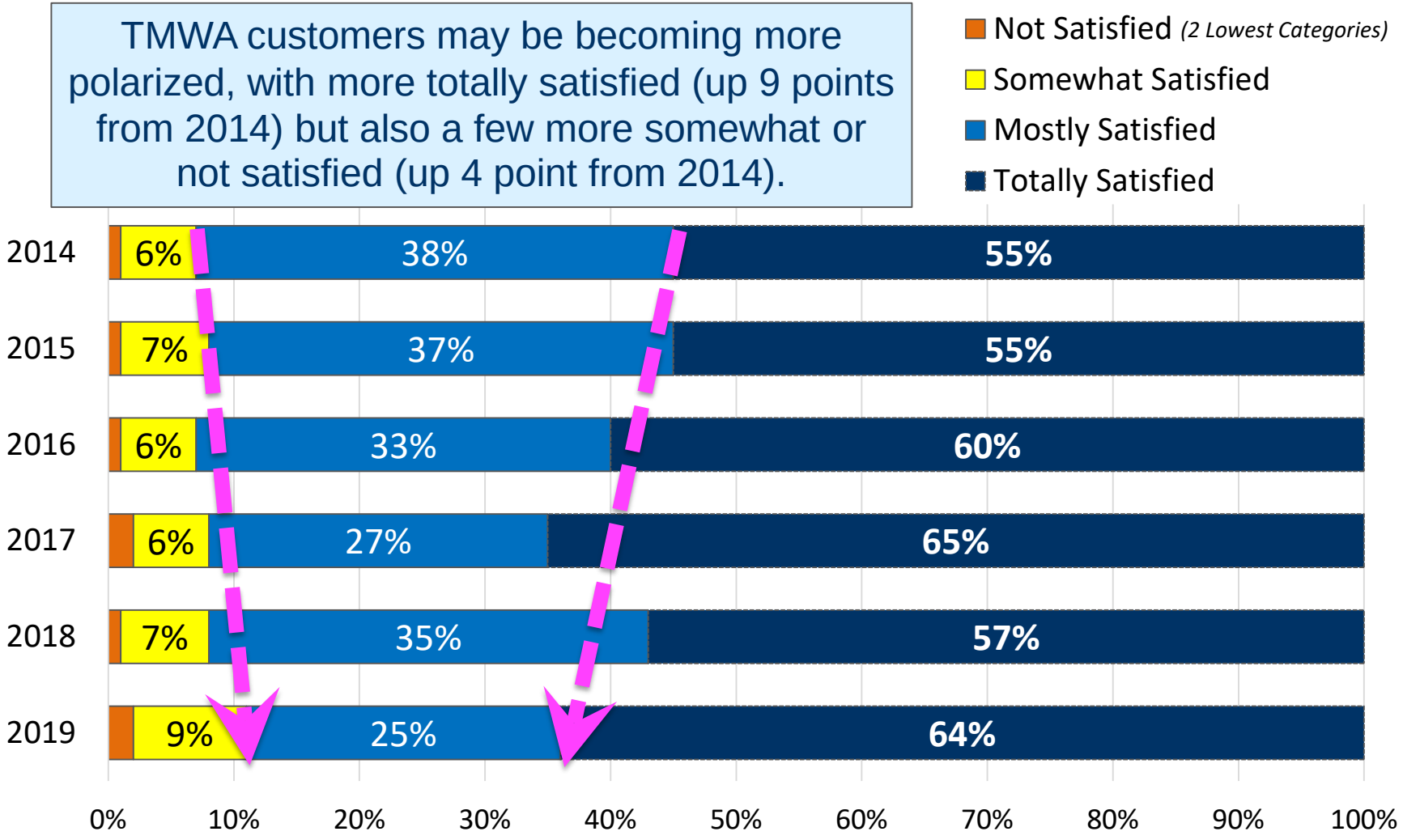
2002 - 2019



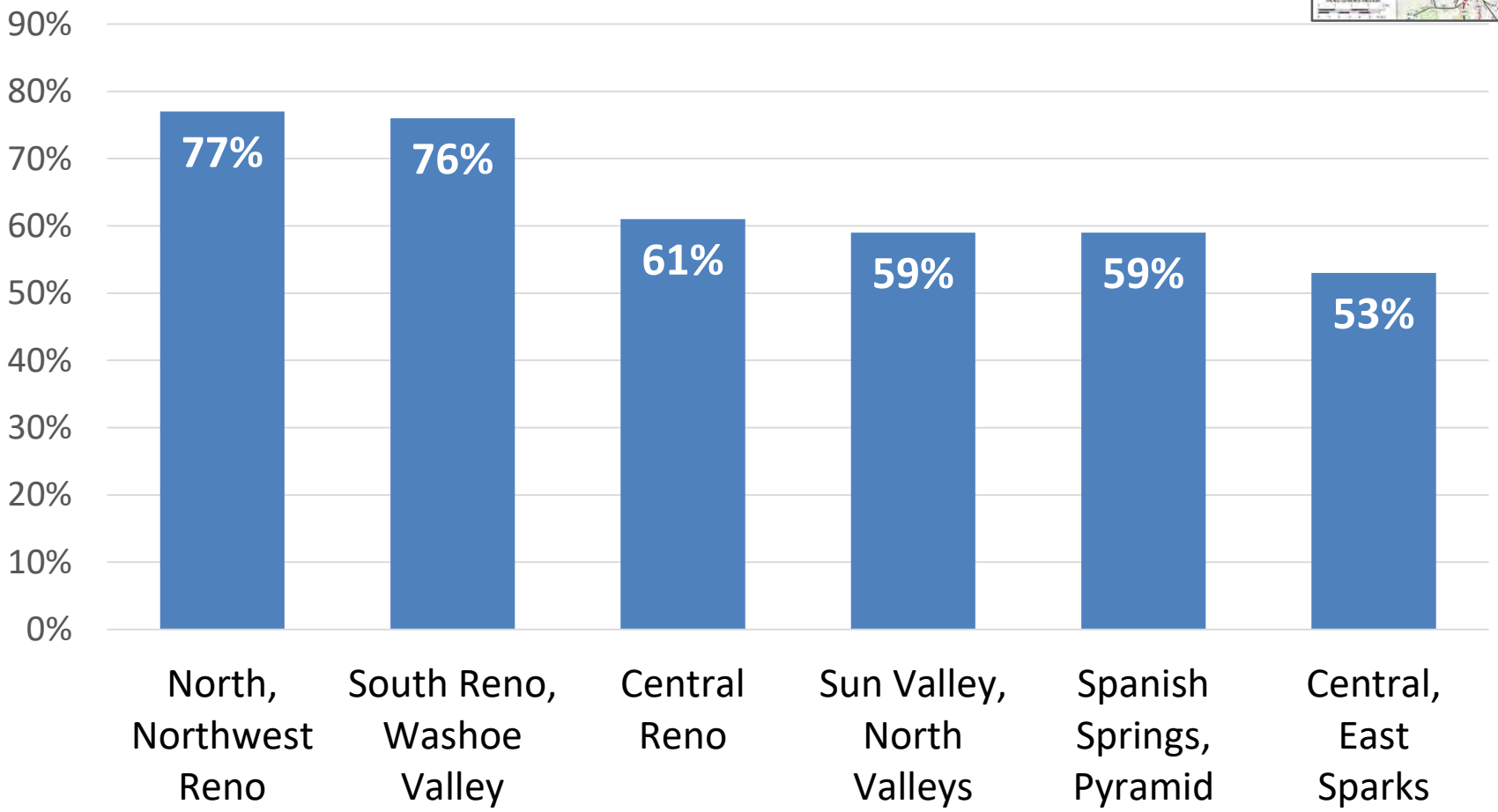
- From 2002 to 2007, overall satisfaction ratings ranged from 73-82% favorable.
- From 2008 to 2012, overall satisfaction ratings ranged from 85-89% favorable.
- For the last seven years, overall satisfaction ratings have been in the 90-93% range.

A Potential Developing Trend Regarding Overall Satisfaction – 2014 - 2019

TMWA customers may be becoming more polarized, with more totally satisfied (up 9 points from 2014) but also a few more somewhat or not satisfied (up 4 point from 2014).



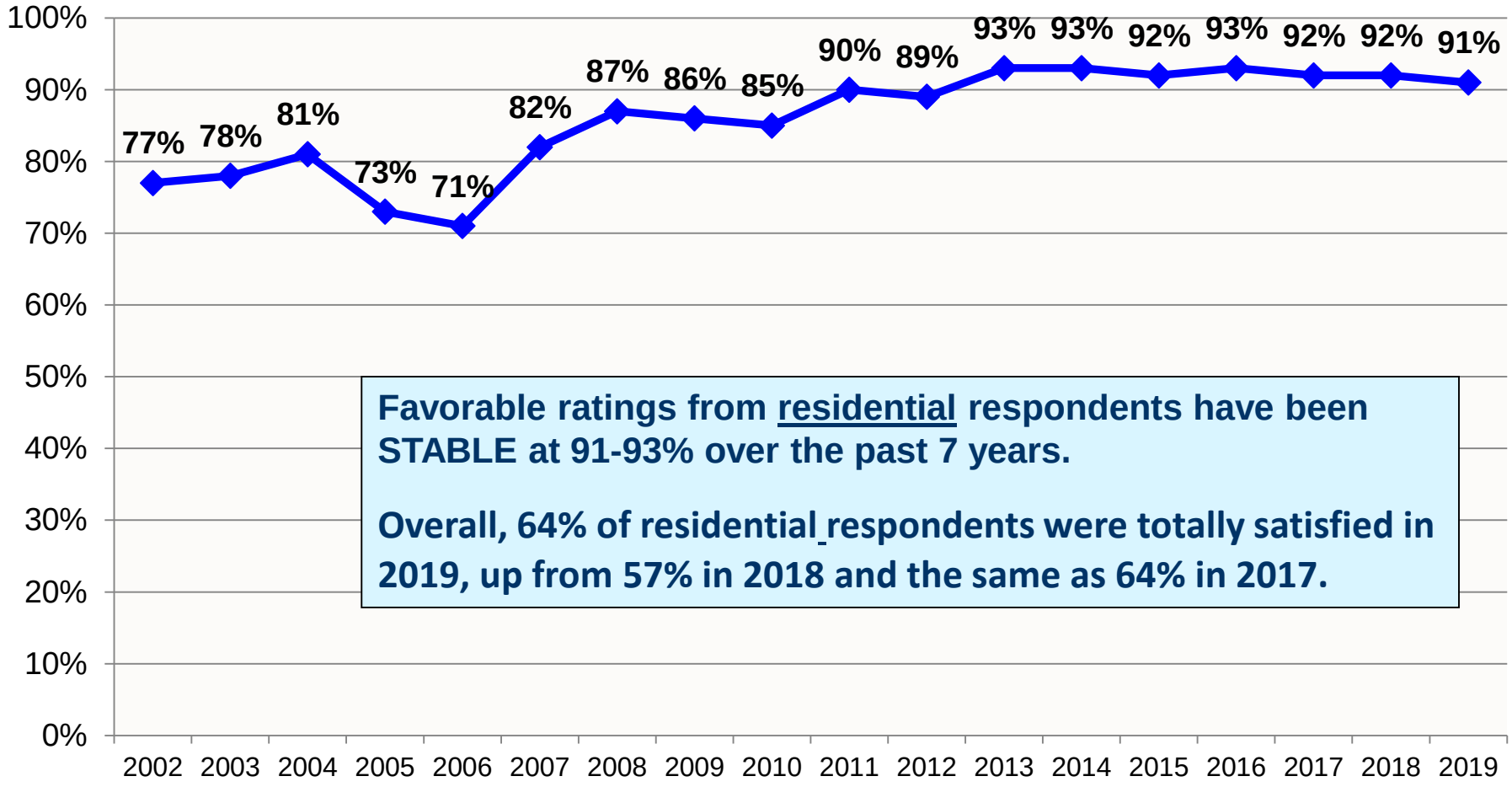
Percentage Who are "Totally Satisfied" – By Geographic Area in 2019



Overall Customer Satisfaction with Example Comments - 2019

- **Totally Satisfied (64%)**
  - *"I really appreciate all the help TMWA gave me."*
  - *"Keep providing water that tastes good."*
  - *"They are doing a great job and they provide good service."*
- **Mostly Satisfied (25%)**
  - *"A government entity doing an above average job."*
  - *"Would like to have someone come out and test our water quality."*
  - *"Would rather get notified of issues on the website, rather than in the bill or news."*
- **Somewhat Satisfied (9%)**
  - *"Communicate more through email."*
  - *"I have problems with the taste of the water sometimes."*
- **Not Very Satisfied or Not at All Satisfied (2% Combined)**
  - *"Do more community meetings."*
  - *"I will have to buy a water compressor to get my water pressure up."*

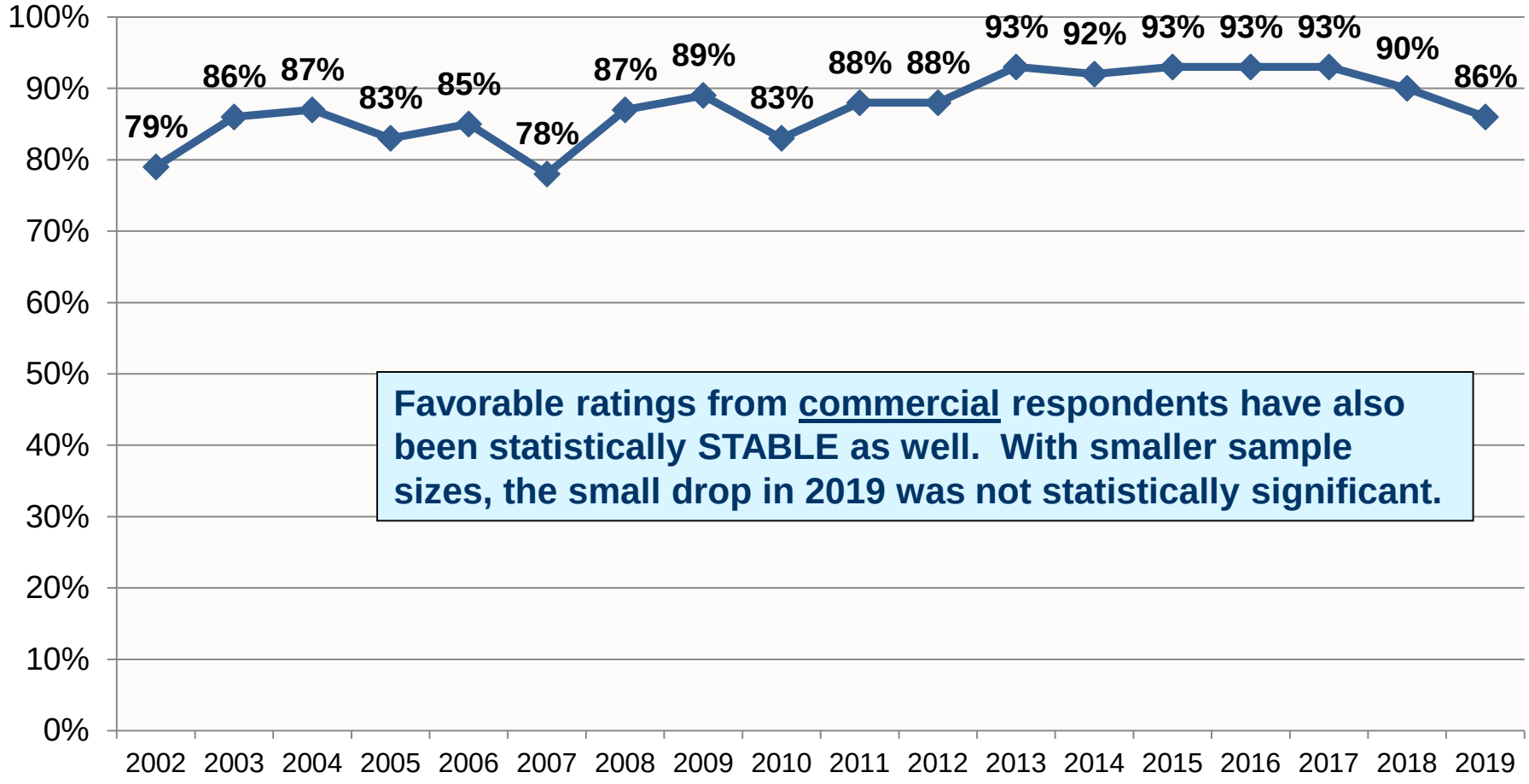
Overall Satisfaction Among Residential Respondents
2002 - 2019



Favorable ratings from residential respondents have been STABLE at 91-93% over the past 7 years.

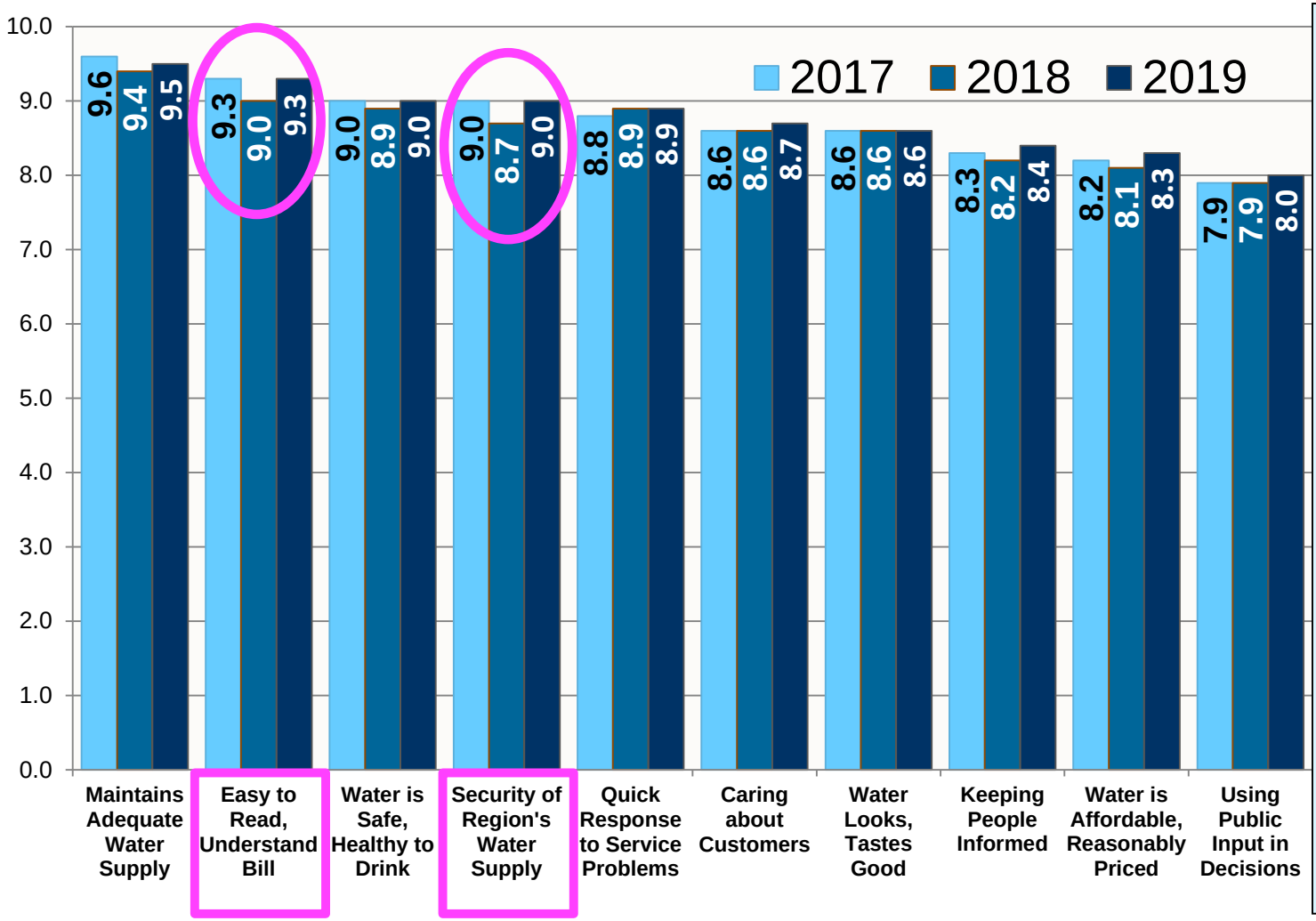
Overall, 64% of residential respondents were totally satisfied in 2019, up from 57% in 2018 and the same as 64% in 2017.

Overall Satisfaction Among Commercial Respondents
2002 - 2019



TMWA's Performance – 2017-2019

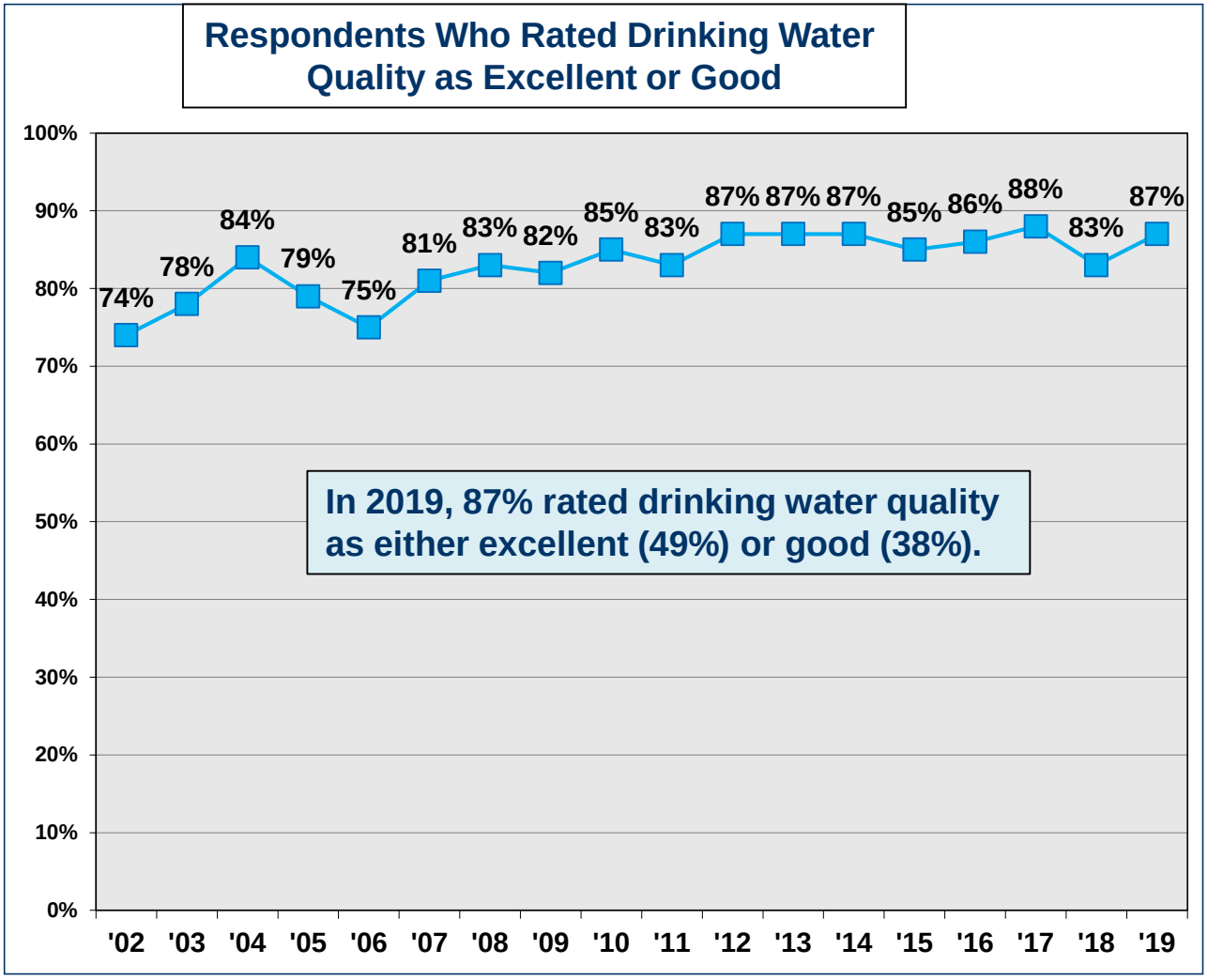
Scale from 0 "Very Poor Job" to 10 "Excellent Job"



In 2019:

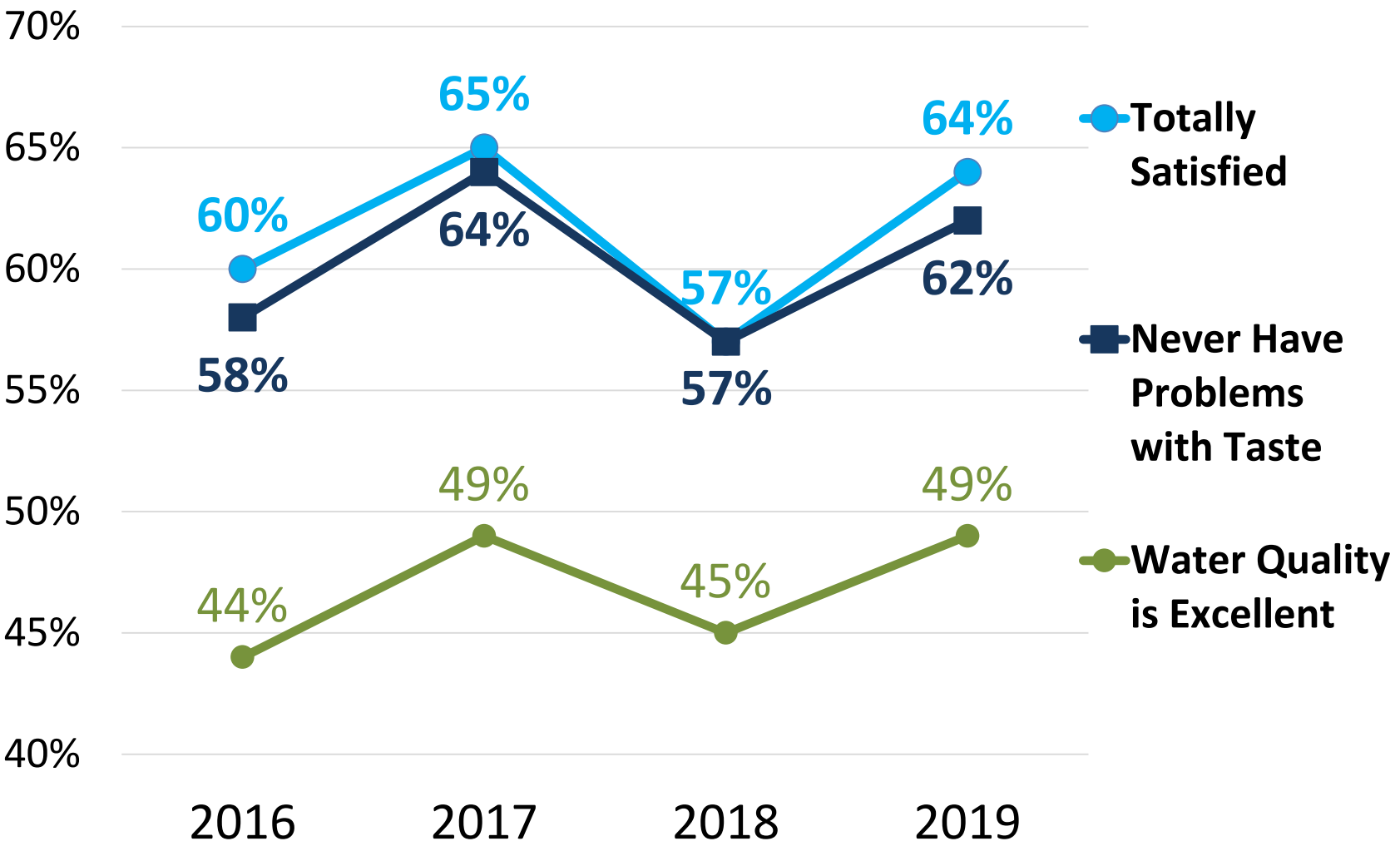
- **All 10 performance measures had a mean of 8.0 or higher on a 0-to-10 scale.**
- **The highest rated item was maintaining an adequate water supply (9.5), while the lowest was using public input in decisions (8.0).**
- **Residential and commercial respondents provided statistically similar ratings for all 10 performance measures.**
- **Ratings dropped then rebounded up significantly for ease of reading the water bill and security of the water supply.**

Quality of Drinking Water
2002 - 2019



- **UNCHANGED: Nearly all respondents (94%) noted no difference in water quality as compared to one year ago; 4% said it was better and 2% said it was worse.**
- **UNCHANGED: Three out of five (60%) reported that the overall quality of tap water was better than that of other cities, while just 4% said it was worse.**
- **REBOUNDED UP: The percentage who reported "never" having problems with the taste (62%) rebounded up from 57% in 2018 and was similar to 64% in 2017.**

Relationships between Satisfaction and Perceptions of Water Quality



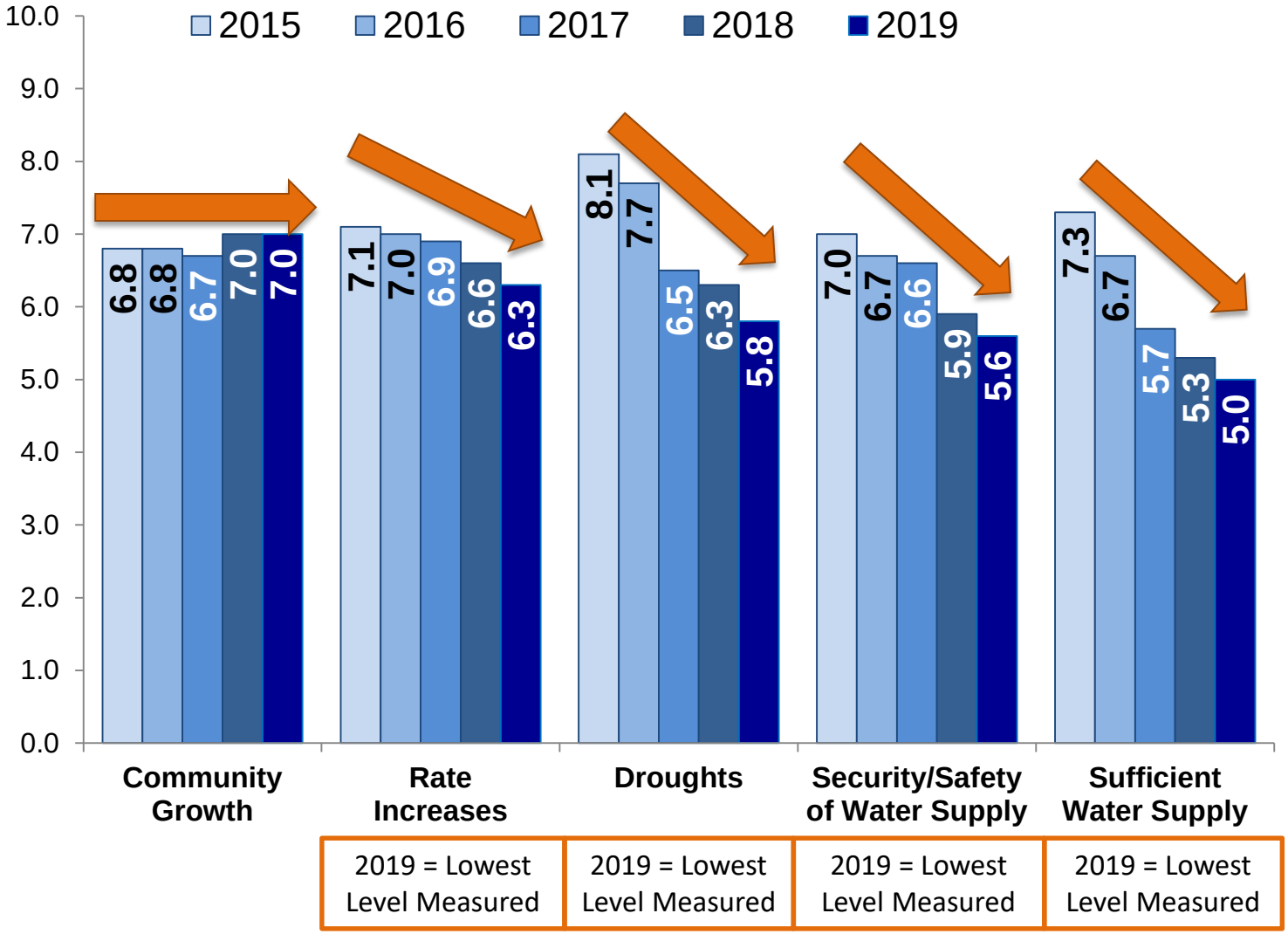
Use of Water Filter in Home for Tap Water
(New Question in 2019)

- **In 2019, 36% of residential respondents indicated that they use a water filter in their home for tap water.**
- **Those who lived alone and/or who were age 65 or older were less likely to have a water filter.**
- **Respondents with older homes were <u>not</u> more likely to have a water filter.**
- **The top reason for using a filter was for the taste of the water.**

Reason	%	Example Comments
Taste, Flavor	29%	"*Tastes better," "Because of the taste."*
Filter in Fridge	19%	*"Fridge line," "It's on our fridge."*
Chemicals, Residue	18%	*"Clear out impurities," "Get Chlorine out."*
Health, Safety,	13%	*"Pregnant," "Can never be too careful."*
Availability	6%	*"Came with the house," "A present."*
Old House/Pipes	3%	*"It's an old house," "Don't trust pipes."*
Other Reasons	12%	*"Hard water," "For wife," "To keep cold."*

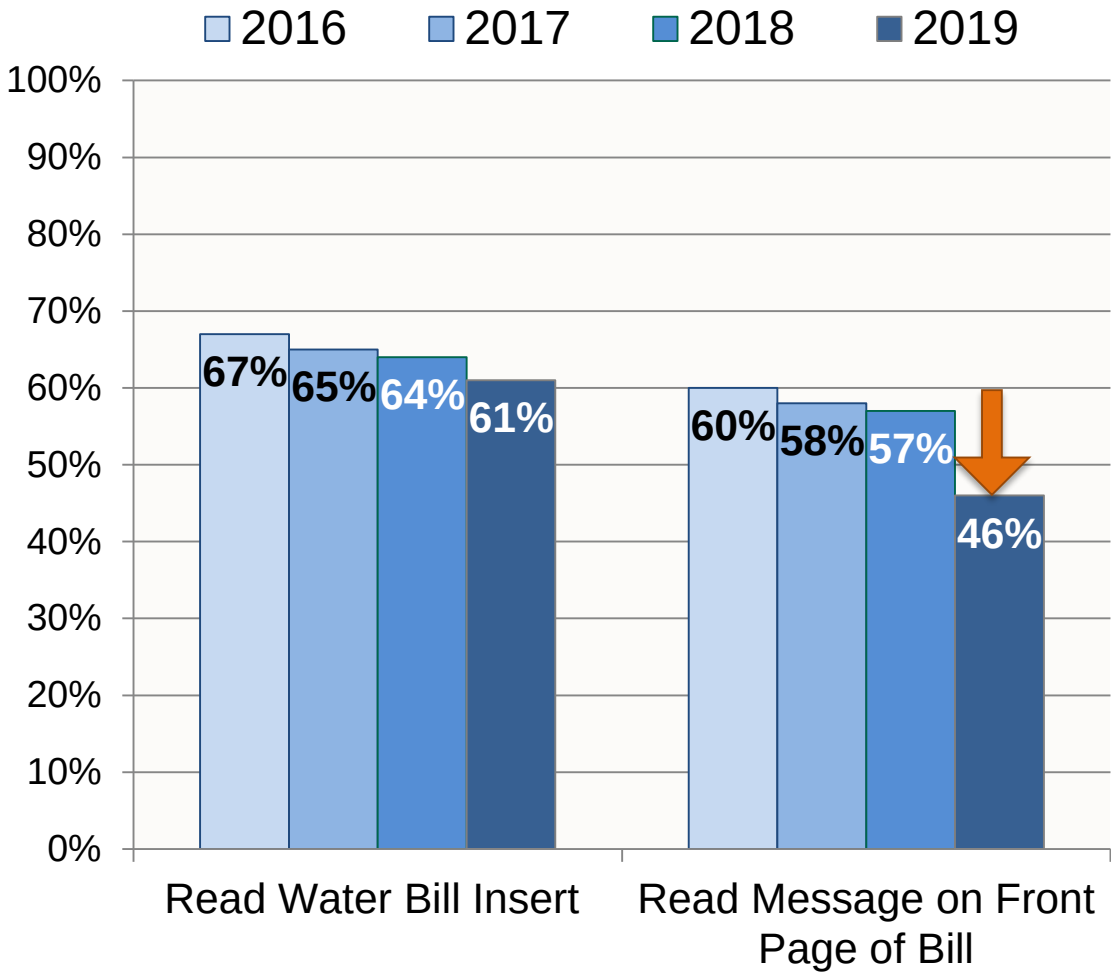
Trends for Concerns – 2015-2019

Scale from 0 "Not at all Concerned" to 10 "Very Concerned"



- **Concern about community growth has remained moderately high, while levels of concern about the other four measures have trended down.**
- **Four of these measure were at their lowest level measured to date since 2002!**

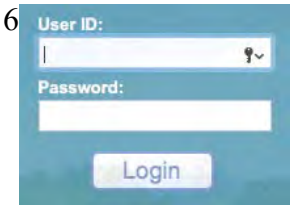
Attention to Written Messages in the Water Bill – 2016-2019



- **Consistently, slightly more people read the water bill <u>insert</u> than read the message on the front page of the bill.**
- **The percentage who said they read the front page message dropped from 57% last year to 46% in 2019; this is the lowest percentage measured to date.**
- **In 2019, 57% of respondents age 65 or older read the front page message, as compared to 40% of those age 45-64, and 38% of those under age 45.**

Accessed Online TMWA Account

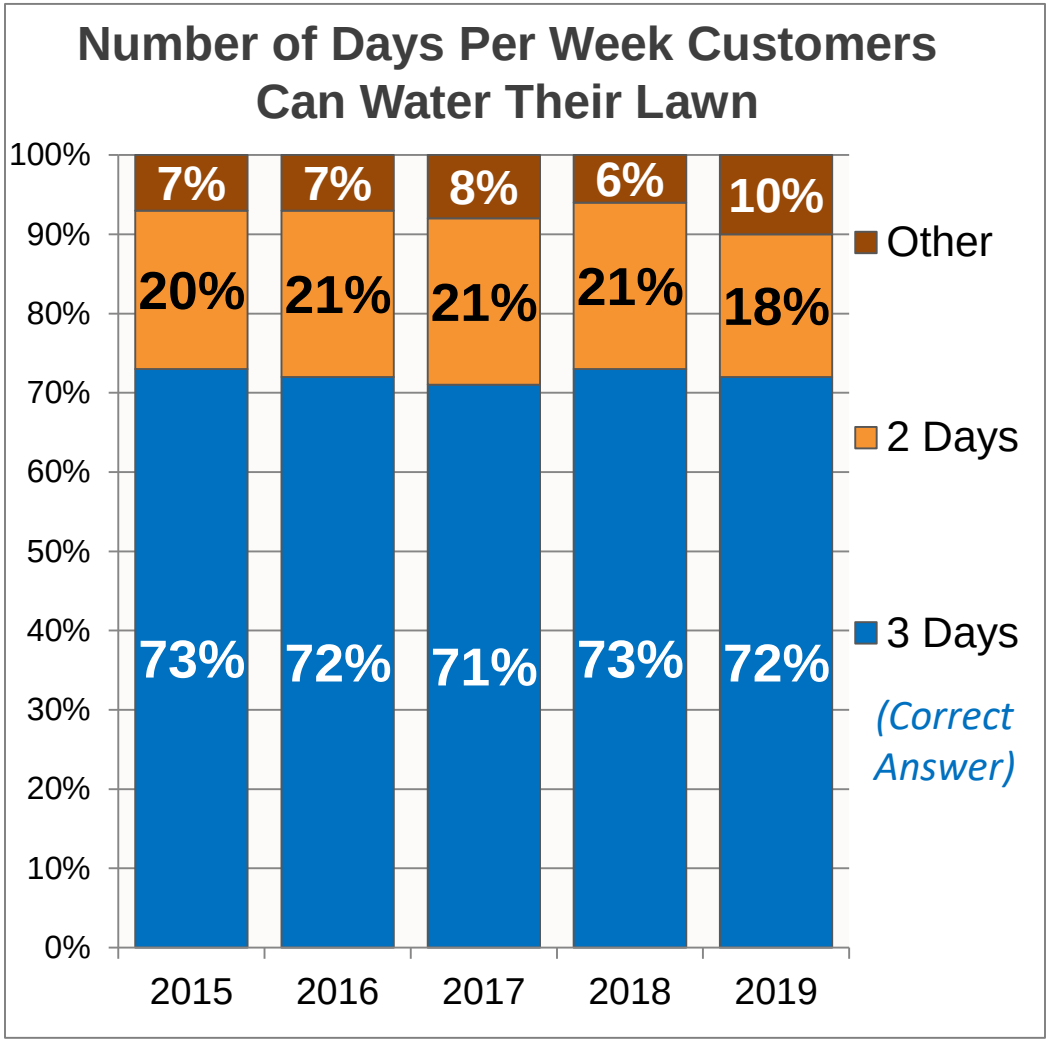
2003-2019



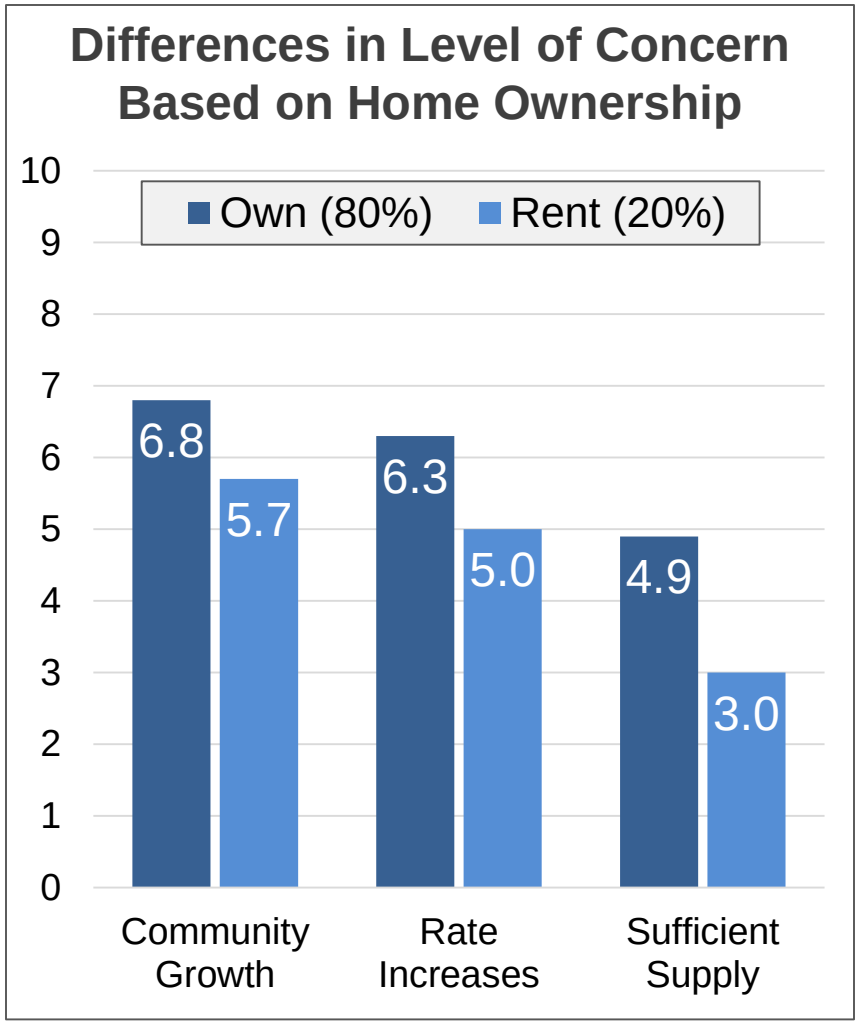
- In 2019, most (88%) were aware that they could view their TMWA account online; 39% of all respondents did.

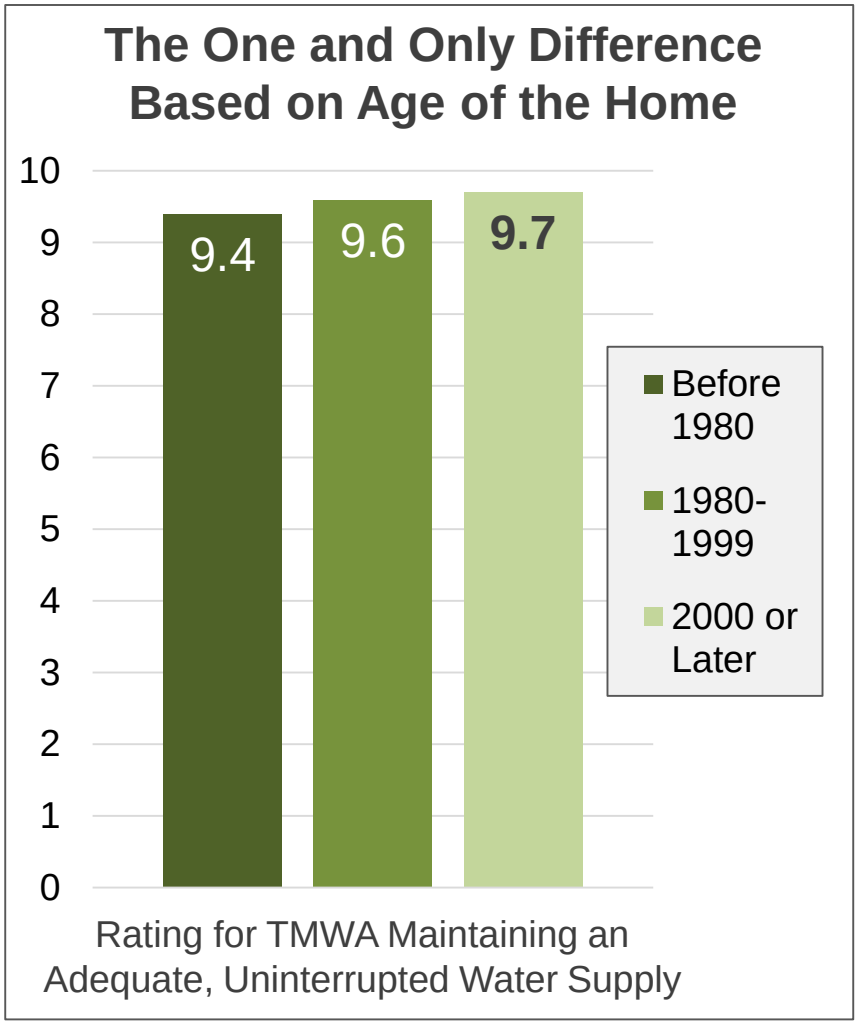
Assigned Day Watering Awareness
2015 - 2019

- **In 2019, 90% of all respondents were aware of Assigned Day Watering.**
- **Respondents with less than 5 years of residency were less likely to be aware of Assigned Day Watering (79%) than were those with longer residency (92%).**
- **In 2019, two out of three (64%) had a lawn that they water.**
- **Among those who were aware of Assigned Day Watering and had a lawn, 72% reported that they could water 3 days a week, similar to 71%-73% over the prior four years.**
- **In 2019, residential respondents with a lawn reported that, on average, one-third (34%) of their yard was lawn, the same percentage as in 2018.**



Factors Based on Home Ownership and Age of the Home





2019 Summary: Connection to TMWA's Goals and Communication Initiatives

TMWA's Goals for Customer Satisfaction	
Residential: Achieve at least 71% favorable ratings; 82%-86% is "excellent" and over 86% is "outstanding"	In 2019, 91% favorable – "**Outstanding**." Rating remained stable with a similar score to last year (92%).
Commercial: Achieve at least 77% favorable ratings; 88%-90% is "excellent" and over 90% is "outstanding"	In 2019, 86% favorable. Rating remained stable with a similar score to last year (90%)."

Communication Initiatives	
Increase awareness of value	***Stable.*** In 2019, 75% rated value for price as excellent or good; this score has be 74% or 75% since 2016.
Increase awareness of water quality	***Stable.*** In 2019, 87% rated drinking water quality as either excellent or good, similar to 83% last year and 88% in 2017.
Increase awareness of opportunities for public input in decision making	***Stable.*** In 2019, the mean rating for using public input was 8.0; this rating has been statistically stable since 2012.

TRUCKEE MEADOWS WATER AUTHORITY

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Customer Satisfaction Study Fiscal Year 2019

InfoSearch™ INTERNATIONAL

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STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: Michele Sullivan, Chief Financial Officer
DATE: October 7, 2019
SUBJECT: **Required Communication from Eide Bailly in regards to TMWA's Annual Financial Audit**

Summary

The attached written communication from TMWA's external auditors, Eide Bailly, sets forth expectations for conducting and completing the audit of TMWA's financial statements and related disclosures for the fiscal year ended June 30, 2019. The Eide Bailly communication also defines the roles and responsibilities of TMWA's management, Eide Bailly, and the TMWA Board of Directors.

EideBailly
CPAs & BUSINESS ADVISORS

October 8, 2019

To the Board of Directors
Truckee Meadows Water Authority
Reno, Nevada

This letter is provided in connection with our engagement to audit the financial statements of Truckee Meadows Water Authority as of and for the year ended June 30, 2019. Professional standards require that we communicate with you certain items including our responsibilities with regard to the financial statement audit and the planned scope and timing of our audit.

Our Responsibilities
As stated in our engagement letter dated March 6, 2019, we are responsible for conducting our audit in accordance with auditing standards generally accepted in the United States of America and, in accordance with *Government Auditing Standards*, for the purpose of forming and expressing an opinion about whether the financial statements that have been prepared by management, with your oversight, are prepared, in all material respects, in accordance with accounting principles generally accepted in the United States of America. Our audit of the financial statements does not relieve you or management of your respective responsibilities.

Planned Scope of the Audit
Our audit will include examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements; therefore, our audit will involve judgment about the number of transactions to be examined and the areas to be tested. Our audit is designed to provide reasonable, but not absolute, assurance about whether the financial statements as a whole are free of material misstatement, whether due to error, fraudulent financial reporting, misappropriation of assets, or violations of laws or governmental regulations. Because of this concept of reasonable assurance and because we will not examine all transactions, there is a risk that material misstatements may exist and not be detected by us.

Our audit will include obtaining an understanding of the entity and its environment, including its internal control, sufficient to assess the risks of material misstatement of the financial statements and as a basis for designing the nature, timing, and extent of further audit procedures. Our audit is not designed to express an opinion or provide assurance on internal control over financial reporting. However, we will communicate to you at the conclusion of our audit, significant matters that are relevant to your responsibilities in overseeing the financial reporting process, including any material weaknesses, significant deficiencies, and violation of laws or regulations that come to our attention.

We began our audit in May 2019 and issue our report by November 30, 2019.

This information is intended solely for the information and use of the Board of Directors and management of Truckee Meadows Water Authority and is not intended to be and should not be used by anyone other than these specified parties.

Respectfully,

Eide Bailly LLP

Reno, Nevada

TRUCKEE MEADOWS WATER AUTHORITY
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STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: John Enloe, Director Natural Resources
DATE: October 10, 2019
SUBJECT: **Discussion and action, and possible direction to staff regarding the approval of agreement with Washoe County to utilize funds of up to $286,937 of remaining Washoe County AB9-SQ1 funds for the One Truckee River Restroom Project**

Recommendation

Staff recommends the Board authorize the General Manager to finalize and execute an agreement with Washoe County to utilize funds of up to $286,937 of remaining Washoe County AB9-SQ1 funds for the One Truckee River Restroom Project.

Summary: In November 2002, the voters of Nevada approved a bond measure (State Question 1) which included the allocation of $10,000,000 for the enhancement of the Truckee River corridor. Washoe County has designated the One Truckee River Restroom Project as being eligible for AB9-SQ1 money and has entered into a memorandum of understanding with the State of Nevada Department of Conservation and Natural Resources regarding such use. The parties, in collaboration with the One Truckee River Partnership, wish to begin the One Truckee River Restroom Project to address high priority Action Items from the One Truckee River Corridor Management Plan, including initiation of a pilot study of additional public restroom facilities in priority areas along the river corridor.

The State of Nevada Department of Conservation and Natural Resources approved the Project Application and Work Plan on July 10, 2019 to use $286,937 of remaining Washoe County AB9-SQ1 funds for the One Truckee River Restroom Project. The Project will consist of the purchase and installation of "Portland Loo" style restrooms at priority sites along the Truckee River identified through the One Truckee River Partnership. Phase I of the project includes the pilot restroom installation which is planned to occur at Brodhead Park. Subsequent installations may occur as part of Phase II at any other identified priority site with permission from the managing agency.

Under the terms of the funding agreement with Washoe County, TMWA is authorized to purchase "Portland Loo" or other approved restrooms for current or future installation. The State Bond Funds must be spent by the TMWA prior to June 30, 2020. All invoices must be submitted to the Washoe County for reimbursement by June 1, 2020. If the State Bond Funds have not been spent by June 30, 2020, all funds will go back to the State of Nevada Department of Conservation and Natural Resources.

Staff is seeking authorization for the General Manager to finalize and execute an agreement (in substantially the same form as the attached agreement) with Washoe County to utilize funds of up to $286,937 of remaining Washoe County AB9-SQ1 funds for the One Truckee River Restroom Project.

Attached: Agreement Regarding November 2002 State Question 1: Parks and Open Space Bond Issue - Truckee River, One Truckee River Restroom Project Implementation Funding

AGREEMENT REGARDING
NOVEMBER 2002 STATE QUESTION 1:
PARKS AND OPEN SPACE BOND ISSUE - TRUCKEE RIVER
ONE TRUCKEE RIVER RESTROOM PROJECT IMPLEMENTATION FUNDING

This Agreement is entered into this ___day of **October**, 2019, by and between Washoe County, a political subdivision of the State of Nevada (hereinafter, "Washoe County or Grantor") and Truckee Meadows Water Authority, a joint powers authority entity created pursuant to a cooperative agreement among the cities of Reno, Nevada, Sparks, Nevada, and Washoe County, Nevada, pursuant to NRS Chapter 277 (hereinafter, the "Grantee"), collectively referred to as the "Parties."

WHEREAS, In 2001, The Nevada Legislature (AB 9 of the 17th Special Session) proposed and in November 2002, the voters of Nevada (State Question 1) approved a bond measure which included the allocation of $10,000,000 for the enhancement of the Truckee River corridor, authorizing the use of funds to acquire and develop land and water rights, provide recreational facilities, provide parking for and access to and along the river, or restore the Truckee River Corridor. Washoe County has designated the Project, as described below, as being eligible for AB9-SQ1 money and has entered into a memorandum of understanding with the State of Nevada Department of Conservation and Natural Resources regarding such use.

WHEREAS, the One Truckee River Corridor Management Plan-One River Initiative Phase I is complete and the parties as part of and in collaboration with the One Truckee River Partnership wish to begin the One Truckee River Restroom Project (the "Project") to address high priority Action Items from the Master Plan including 1.3.c (Ensure adequate public restrooms along the Truckee River. Initiate a pilot study of temporary restroom facilities in priority areas along the river corridor.), and 2.1.e (Enhance Truckee River visitor safety, access, public facilities (bathrooms) and education.)

WHEREAS, the State of Nevada Department of Conservation and Natural Resources approved the Project Application and Work Plan on July 10, 2019 to use $286,937 of remaining Washoe County AB9-SQ1 funds for the One Truckee River Restroom Project.

WHEREAS, the parties desire to document, by this Agreement, a funding arrangement pursuant to which Washoe County will reimburse Grantee for the Project;

NOW, THEREFORE, be it resolved the parties agree as follows:

1. **Project Scope of Work ("the work")**
   The Project will consist of the purchase and installation of "Portland Loo" style restrooms at priority sites along the Truckee River identified through the One Truckee River Partnership. Phase I of the project includes the pilot restroom installation which is planned to occur at Brodhead Park. Subsequent installations may occur as part of Phase II at any other identified priority site with permission from the managing agency. Installing the "Portland Loo" style restroom is

recommended by the One Truckee River's Housing and Sanitation Working Group, but other styles of restroom may be purchased and installed by Grantee based on site conditions.

2. Exhibits

Attached hereto and incorporated herein are the following Exhibits

Exhibit A –Draft 9-27-19 River Restroom Project – Proposed Phases I through IV

Exhibit B – Approved SQ1 Project Application and Work Plan

3. Term This Project Funding Agreement shall be effective from **OCTOBER , 2019**, to June 30, 2020, unless sooner terminated by either party as specified in paragraph 8 herein.

4. Purchase and Installation of Restrooms

a. Grantee is hereby authorized to purchase "Portland Loo" or other approved restrooms for current or future installation as part of Phases I through II of the Project. Grantee is further authorized to perform or have another perform necessary, qualified, and competent consulting, data gathering, design, survey, engineering, permitting, geotechnical, site preparation including installing additional utility lines, construction, and any other related work for restroom installation as part of the Project subject to the terms and conditions herein.

b. General Project Administration. Grantee shall perform or have performed, without limitation, Project schedules, coordination, notices, meeting space, planning, design, contract preparation, and financial administration, including, obtaining any required permitting, conducting environmental assessments and National Environmental Policy Act (NEPA), Commission on Cultural Affairs (CCA), Nevada Department Environmental Protection (NDEP and EPA), review processes advertising and bid award. Grantee shall follow its own established procurement procedures for all Project purchases and contract awards.

c. By execution of this Agreement, Grantee covenants with Grantor, through its Community Services Department, to perform the Work pursuant to and in accordance with the terms and conditions of this Agreement, as set forth in Exhibits A and B, and any future developed and approved Scope of Work. Grantee further covenants to perform or covenants to have another perform the Work in compliance with all applicable federal, state, local laws and applicable regulations, including, without limitation, competitive bidding laws, prevailing wage requirements and United States Army Corps of Engineers' ("USACE") Section 104 cost credit requirements. Grantee shall select consultants and award bids to contractors who can perform with the requisite skill, judgment, and experience required by the Work under this Agreement or any future Scope of Work approved by Washoe County.

5. Project Funding.

a. Funding Sources. The total estimated Project costs for Phases I and II are $254,974 and $510,504 respectively, as identified in Exhibit A. Grantee has identified cash match of $150,000 for Phases I and II as outlined in Exhibit A. Grantor has allocated the amount of $286,937 from the State Question 1 Parks and Open Space Bond funds for Phase I and II elements identified in paragraphs 1 and 2 herein. If the total cost of Phases I and II does not exceed $286,937, Grantee shall not be reimbursed above the value of actual cost. Grantee is solely responsible to obtain funding for any Project costs that exceed Grantor's total SQ-1 contribution amount of $286,937.

b. Grantor shall not be responsible for any increased Project costs caused by Grantee's negligence, including but not limited to, material errors and omissions in all application and permitting processes, plans, specifications and contract documents, material defects in scope of work or plans and specifications matters; material failure to meet the Project's performance or hydrologic/hydraulic standards; change orders not accepted by Washoe County; and contractor claims of any kind or nature.

c. State Question 1 Policies. Grantee covenants to comply with all policies and procedures adopted by the State for State Question 1 projects and Grantor has provided a complete and current copy of such policies and procedures to Grantee or shall provide online internet access to such policies and procedures. Grantee shall submit Project and budget information on forms, and within specified deadlines, prescribed by Grantor and State. It is Grantee's responsibility to be aware of and adhere to all policies and procedures required by the State. In the event of any inconsistency between this Agreement and the State policies and procedures, the State policy and procedures shall govern.

d. Obligation of Funding. The State Bond Funds must be spent by the Grantor prior to June 30, 2020. All invoices must be submitted to the Grantor for reimbursement by June 1, 2020. If the State Bond Funds have not been spent by June 30, 2020, all funds will go back to the State of Nevada Department of Conservation and Natural Resources.

e. Grantee understands and agrees that the Grantor shall only reimburse Grantee for authorized expenses after Grantor reviews and approves invoices submitted by Grantee for compliance with this Agreement, plans and specifications for the Work and any future Scope of Work approved by Grantor. For any up-front costs incurred by Grantee after the execution of the agreement that are directly related to the Project, Grantor shall reimburse Grantee for those authorized costs, charges and expenses, as long as the total amount reimbursed, including such up-front costs, does not exceed the total amount of $286,937. Grantee shall be solely responsible for any costs, charges, and expenses of the Project that exceed the amount of $286,937.

f. Authorized Reimbursements. Funding for the Project will be disbursed by Grantor to Grantee on a reimbursement basis. Reimbursement of Grantee expenses will be paid as

invoices, accompanied by supporting documentation, are received by Grantor. Final invoices are due to Grantor by June 1, 2020. Supporting documentation includes an exact itemization of project expenditures for the period of the invoice, a listing of check numbers, amounts and payees for the period, copies of itemized invoices for all expenditures and copies of properly documented timesheets or labor reports. Grantor shall cause payment to be made within thirty (30) days of receipt of complete, undisputed reimbursement requests.

g. The State Question One Program prohibits reimbursement of Project funds for the following expenses: Secretarial or word processing services (normal, temporary, or overtime);

a. Other staff charges, such as filing; proofreading, regardless of when
b. Indirect and administrative overhead costs such as salaries and benefits;
c. Photocopy expenses
d. Computer time.

h. Notwithstanding those unauthorized reimbursements contained in Section 5(g) above, the State allows reimbursement of Project Funds for the following:

a. Local telephone expenses or office supply costs; and
b. The cost of first-class travel not to exceed the Government Standard Approved Rate.

i. Project Funding Match. As required by Assembly Bill 9, eligibility to receive the bond proceeds is contingent upon meeting the required matching contribution of project related expenditures. The Nevada State Department of Conservation and Natural Resources determined that the Grantor has already met the match requirements for the original amount of $10,000,000 SQ-1 funds received as documented in Exhibit B. The Grantee is not required to provide additional matching funds for the Project.

6. Reporting and Auditing Requirements.

a. Grantee shall be responsible to Washoe County for providing a final Project status report within sixty (60) days after final invoices are submitted or by June 30, 2020, whichever comes first.

The final report shall provide a description of work completed to date, future planned work, and what was accomplished with SQ1 funding. Attached to final report shall be a final accounting and exact itemization of total project revenue and expenditures, with a list of all check numbers, amounts and payees.

b. All accounting documentation must be maintained by Grantee and is subject to audit by any of Grantor's agents. Grantee must maintain and make available its books, files and records to facilitate any such audit. Grantee must comply with and fully participate with any federal, state or local audit requirements. Grantor reserves the right to request additional documentation from Grantee regarding revenues or

expenditures. Grantor reserves the right to reject all or part of any proffered documentation of recipient's expenditures that does not materially comply with State policies and procedures.

c. Grantee agrees to maintain all records relevant to its SQ1 One Truckee River Restroom Project for which funds were allocated in accordance with NRS Chapter 239; additionally, Grantee must keep records at least six (6) years from the end of the state fiscal year (July-June) in which the project was completed. If any litigation concerning the project is begun before the expiration of this six (6) year period, the individual file must be retained for six (6) calendar years from the date of resolution of the litigation; and before any files are destroyed Grantee must contact the State Department of Conservation and Natural Resources to obtain and verify final disposition instructions. This requirement also applies to the Grantee's contractors and any subcontractors.

7. Termination. In the event Grantee fails to perform any duty or satisfy any term or condition contained in this Agreement, Grantor shall provide Grantee with written notice thereof and Grantee shall thereafter have thirty (30) days or other reasonable time period to cure or diligently commence to cure such failure. If Grantee fails to cure, or fails to diligently pursue curing, any defect in performance to the reasonable satisfaction of Grantor, Grantor may terminate this Agreement with thirty (30) days advance written notice to Grantee.

In the event no funds or insufficient funds are appropriated and budgeted in any fiscal year for the payments due to Grantee under this Agreement, the County will immediately notify Grantee of such occurrence. In such event, this Agreement shall immediately terminate, without penalty or expense to the County, except for any such funds, which are due and payable to Grantee hereunder, for which services have been rendered on or before the date of said notice from the Grantor. County acknowledges that $286,937 have been appropriated and are budgeted for this Project for fiscal year 2019-2020.

Grantee may terminate this Funding Agreement prior to commencement of construction upon 30 days written notice to Grantor if (i) final design plans are not approved; or (ii) required permits, agreements, or subcontracts cannot be secured upon terms reasonably satisfactory to Grantee, and in that event, all unexpended funds shall promptly be returned to Grantor.

8. Insurance.

a. Grantee's contracts with any consultants or subcontractors hired for the purposes of designing or constructing any phase or element of the Project mentioned herein shall require each consultant or subcontractor to provide evidence of insurance for:
   (1) General liability;
   (2) Automobile liability; and
   (3) Professional liability (if the contract involves any design work).

b. All policies of general liability and automobile liability insurance shall be endorsed to add Grantor and Grantee as additional insureds.

9. General Provisions.

a. Entire Agreement. This Agreement represents the full and complete understanding by all of the parties and changes may be made only with the written approval of the parties.

b. Assignment. This Agreement shall be binding upon the parties, their representatives, successors and assigns. No assignment or transfer of this agreement or any part thereof shall occur unless mutually agreed upon in writing by both parties.

c. Modification. This Agreement may be modified in writing and signed by both parties.

d. Severability. Each paragraph and provision of this Agreement is severable, and if one or more paragraphs or provisions of this Agreement are declared invalid, the remaining paragraphs and provisions of this Agreement will, if possible, remain in full force and effect.

e. Covenants of Further Assurance. The parties to this Agreement covenant and agree to act in good faith and to take such further action as may be required to fully effectuate the intentions of the parties under this Agreement.

f. All notices required by this Agreement shall be in writing, must be sent to the addresses provided below and are deemed effective upon placement in the United States Mail, postage prepaid addressed to:

Grantor
Washoe County
Attn: Director Community Services Dept.
1001 E. Ninth St.
Reno, NV 89512

Grantee
Truckee Meadows Water Authority
Attn: General Manager
1355 Capital Blvd.
Reno, NV 89502

g. Choice of law; venue. This Agreement shall be construed in accordance with and be governed by the laws of the State of Nevada. All parties hereto consent to the personal jurisdiction of the Nevada State Courts located in Washoe County, Nevada and to the service of process by any means authorized by rules of Court or under the laws of the State of Nevada. The exclusive venue of any action, proceeding or counterclaim arising out of or in connection with this Agreement shall be Washoe County, Nevada.

IN WITNESS WHEREOF, the parties hereto have executed this agreement this _____ day of _____, 2019

TRUCKEE MEADOWS WATER AUTHORITY

_____

GENERAL MANAGER

STATE OF NEVADA

COUNTY OF WASHOE

On the _____ day of _____, 2019, _____ personally appeared before me, a Notary Public, and acknowledged to me that he executed the above instrument for the purpose therein contained.

_____

Notary Public

COUNTY OF WASHOE, by and through its Board of County Commissioners

_____

CHAIR

STATE OF NEVADA

COUNTY OF WASHOE

On the _____ day of _____, 2019, _____ personally appeared before me, a Notary Public, and acknowledged to me that she executed the above instrument for the purpose therein contained.

_____

Notary Public

TRUCKEE MEADOWS WATER AUTHORITY
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STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: John Enloe, Director Natural Resources
DATE: October 8, 2019
SUBJECT: **Discussion and action, and possible direction to staff regarding approval of the Interlocal Agreement between the Truckee Meadows Water Authority and the City of Reno for providing a sanitary restroom facility on the City's Brodhead Park property for use by the public**

Recommendation

Staff recommends the Board authorize the General Manager to finalize and execute an Interlocal Agreement with the City of Reno for providing a sanitary restroom facility on the City's Brodhead Park property for use by the public as part of the One Truckee River Restroom Project.

Summary

The City and TMWA seek to promote public health and safety and improve water quality in the Truckee River by providing a sanitary restroom facility on the City's Brodhead Park property for use by the public. The purpose is to provide the public with a sanitary restroom to reduce the amount of human waste created near the Park and along the Truckee River and thereby improve public health and safety in the area around the Park and water quality in the Truckee River. The Parties desire TMWA to install a Portland Loo restroom, which has been used successfully in other urban areas, or another restroom facility of a similar nature and functionality.

Per the Agreement, TMWA will use a portion of the Brodhead Park property to construct, install, operate, and maintain, a restroom and related facilities for use by the public. The City shall have no responsibility for the operation and maintenance of the Restroom Facilities, it being the intention that TMWA or third parties be responsible for operation and maintenance of the Restroom Facilities as may be delegated by TMWA. The City, by action through the Reno City Council, may terminate this Agreement at any time so long as it provides TMWA with 90 days advance notice of such termination and provides TMWA a reasonable time period to remove the Restroom Facilities.

Staff is seeking authorization for the General Manager to finalize and execute an Interlocal Agreement (in substantially the same form as the attached agreement) with the City of Reno for providing a sanitary restroom facility on the City's Brodhead Park property for use by the public as part of the One Truckee River Restroom Project.

Attached: Interlocal Agreement Between the Truckee Meadows Water Authority and the City of Reno

INTERLOCAL AGREEMENT BETWEEN THE TRUCKEE MEADOWS WATER AUTHORITY AND THE CITY OF RENO

This Interlocal Agreement dated _____ __, 2019 (Effective Date) is between the Truckee Meadows Water Authority, a joint powers authority under the laws of the State of Nevada (TMWA) and the City of Reno, a municipal corporation (City).

RECITALS

A. NRS 277.180 provides that any one or more public agencies may contract with any one or more other public agencies to perform any governmental service, activity, or undertaking which any public agency, entering into the contract, is authorized to perform.

B. The City and TMWA seek to promote public health and safety and improve water quality in the Truckee River by providing a sanitary restroom facility on the City's Brodhead Park property for use by the public. The purpose is to provide the public with a sanitary restroom to reduce the amount of human waste created near the Park and along the Truckee River and thereby improve public health and safety in the area around the Park and water quality in the Truckee River.

C. The use of a portion of the Park for a restroom facility is an acceptable park use and related to the public purpose for which the Park was established. The Parties desire TMWA to install a Portland Loo restroom, which has been used successfully in other urban areas, or another restroom facility of a similar nature and functionality. The Portland Loo was developed by Madden Fabrication with City of Portland, Oregon staff and officials and is specifically designed to prevent the type of problems encountered with other public restrooms such as cleanliness, crime, and upkeep.

AGREEMENT

NOW THEREFORE, in consideration of the forgoing recitals, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, TMWA and the City agree as follows:

1. Grant of Access and Use Rights. The City hereby grants TMWA, its successors, assigns, agents, and licensees, a revocable license to access and use a portion of the Brodhead Park property, as more particularly described in Exhibit A (License Area), to construct, install, operate, and maintain, a restroom and related facilities (Restroom Facilities) for use by the public. TMWA may install within the License Area minimally intrusive signs and symbols to identify the Restroom Facilities, however, TMWA must consult with the City regarding the design and location of such signs before they are installed. TMWA shall be solely responsible for the design, construction, and installation of the Restroom Facilities. City shall have no responsibility for the operation and maintenance of the Restroom Facilities, it being the intention that TMWA or third parties (such third party(ies) referred to as "O&M Party") be responsible for operation and

maintenance of the Restroom Facilities as such duties may be delegated by TMWA from time to time. The City reserves the right to remove or exclude from the License Area any persons who are engaged in illegal activities, including, but not limited to, violation of the City's park rules and regulations as set forth in Reno Municipal Code Ch. 8.23. The City reserves the right to close Brodhead Park and prohibit access to the License Area to protect the public health, safety, and welfare or for any other purpose within its sole discretion.

2. Cooperation. TMWA and the City shall cooperate with each other and the O&M Party as applicable regarding the operation and maintenance of the Restroom Facility to maximize the benefits to the public and the Truckee River including public outreach and working with various stakeholders to ensure that the Restroom Facility is a success and achieves the objectives described in the Recitals.

3. City Disclaimers and Liability Limitations. City disclaims any obligation or no duty of care: i) to keep the License Area safe for entry or use by others for any purpose; ii) to give any warning of hazardous conditions, uses of, structures, or activities on such premises to persons entering the License Area; iii) for defects in the location, design, construction, installation, maintenance or repair of the Restroom Facilities; iv) for any unsafe conditions within the License Area or for failure to inspect for or warn against possibly unsafe conditions; and v) to close the Restroom Facilities when unsafe conditions may be present. The City does not assume responsibility for or incur liability for any injury to person or property caused by any act of such person to whom permission has been granted except to the extent provided by applicable law. Use of the License Area is at the risk of the user. Nothing in this Agreement limits, reduces, or otherwise impairs the right and ability of the City or TMWA to avail itself of the protections offered by any applicable law affording immunity or limited liability to the City or TMWA.

4. No Dedication for Public Use. The Parties covenant and agree that nothing herein is intended to be nor shall be construed to be a dedication or offer of dedication of land to public use, and that all rights granted herein and use of the License Area is expressly authorized by permission of the City.

5. Liability Limitation. TMWA and City specifically reserve the right to assert and do not waive any liability limitations and immunities conferred by NRS Chapter 41 with respect to any claims, damages, liabilities or actions asserted by any person in connection with the rights and obligations set forth in this Agreement.

6. Insurance. Prior to the use of the License Area, and at all times thereafter during the term of this Agreement, TMWA shall, at TMWA's expense, maintain a commercial general liability insurance policy as provided in this Section to cover the use of the Restroom Facilities on the License Area. The commercial general liability insurance policy shall have a limit of liability of not less than $2,000,000 each occurrence. The liability insurance policy shall be primary with any insurance or self-insurance which may be carried by the City and shall name the City as an additional insured. To the extent TMWA is self-insured, TMWA may satisfy the foregoing insurance obligations through such self-insurance, and TMWA agrees that all the foregoing insurance requirements apply to and will be covered by TMWA's self-insurance program.

7. Compliance with Laws. All work by or on behalf of TMWA within the License Area shall be conducted in compliance with all applicable Federal, state and local laws, rules, regulations, and ordinances, including but not limited to all rules, regulations and procedures of the applicable utility and local government with jurisdiction over such work. The City shall not be responsible for obtaining any permits and approvals required to install and maintain the Restroom Facilities, but must cooperate with TMWA to obtain any approvals required to be issued by the City or which require the City's acceptance or action.

8. Default. If City staff determine that the Restroom Facility is, or is becoming, a detriment to the public health, safety, and welfare, then City staff must use reasonable efforts to work in good faith with TMWA staff to reach a mutually agreeable solution. If any Party defaults on their obligations under this Agreement, then the other Party shall send written notice of such default, which notice must clearly describe the default and the steps to take to cure it. If the defaulting Party (i) fails to cure the default within 30 days of receiving the notice of default or (ii), for defaults that cannot reasonably be cured within 30 days, fails to take all necessary steps to cure the default within 30 days of receiving notice and diligently work to cure the default within a reasonable time period, then the non-defaulting Party may, at its option, terminate this Agreement by providing 60 days prior written notice.

9. Termination; Restroom Removal. The City, by action through the Reno City Manager, may terminate this Agreement at any time so long as it provides TMWA with 90 days advance notice of such termination and provides TMWA a reasonable time period to remove the Restroom Facilities. TMWA must restore the License Area, as near as reasonably possible, to the condition it was in before the Restroom Facilities were installed.

10. Notices. Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing and either served personally or sent by first class mail, postage prepaid, addressed as follows:

To Grantor:
City of Reno
Attn: City Manager
1 East First Street, 15th Floor
Reno, Nevada 89501

With a copy to:
Lori Miles, SR/WA
1 East First Street, 12th Floor
Reno, Nevada 89501

To Grantee:
Truckee Meadows Water Authority
Attn: General Manager
1355 Corporate Blvd.

Reno, Nevada 89502

With a copy to:

Michael Pagni, Esq.
McDonald Carano LLP
P.O. Box 2670
Reno, Nevada 89505
mpagni@mcdonaldcarano.com

or such other address specified in written notice to the other party. Notice, if mailed, shall be deemed to have been given upon the day following the day shown on the postmark of the envelope in which the notice is mailed.

11. Severability; Modification; No Third-Party Beneficiaries. If any term, provision, covenant, condition, or restriction of this Agreement is held by a court of competent jurisdiction to be unlawful, invalid, void, unenforceable, or not effective, the remainder of this Agreement shall remain in full force and effect and shall in no way be affected, impaired, or invalidated. This Agreement constitutes the entire contract between the Parties and shall not be modified unless in writing and signed by the parties. This Agreement shall not be construed to provide any person or entity not a party to this Agreement with any benefits or cause of action arising from the performance of this Agreement.

12. Governing Law. The laws of the State of Nevada shall be applied in interpreting and construing this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their authorized officers the day and year first above written.

CITY OF RENO

By: _____
Hillary L. Schieve, Mayor

ATTEST:

_____
Ashley D. Turney, Reno City Clerk

APPROVED AS TO FORM:

_____
Susan Ball Rothe, Deputy City Attorney

TRUCKEE MEADOWS WATER AUTHORITY

_____
Mark Foree, General Manager

APPROVED AS TO FORM:

_____
Michael Pagni

STATE OF NEVADA)
)
COUNTY OF WASHOE)

This instrument was acknowledged before me this _____ day of _____, 2019, by Mark Foree, General Manager of the TRUCKEE MEADOWS WATER AUTHORITY, on behalf of said Joint Powers Authority therein named.

_____
Notary Public

EXHIBIT "A" to Interlocal Agreement

License Area Description

(See attached)

River Restroom Project – Proposed Phases I through IV

One Truckee River (OTR) is a collaboration of public and private partners focused on the implementation of the OTR Management Plan Phase I unanimously adopted by the three local jurisdictions (Washoe County, City of Reno, and the City of Sparks) in 2016. In 2017, OTR prioritized the effort to increase public restrooms along the Truckee River in the urban Reno-Sparks core. With key supporters including the Truckee Meadows Water Authority (TMWA), Truckee River Fund (TRF), Washoe County, Renown Health, and the Tahoe-to-Pyramid Trail (TPT) is to add up to nine new public restrooms (an increase from 9 to 18) along the Truckee River's 116-mile stretch to improve the region's water quality and well-being.

Summary of Project Need and Benefit: Lack of public restrooms has created a human waste issue that impacts the water quality of the Truckee River and its terminus, Pyramid Lake, which serve as drinking water sources, recreational waters, irrigation water sources, and habitat for federally-listed fishes. TMWA and other agencies regularly record elevated Escherichia coli (E. coli) in the river, and while the source of E. coli has not been tied directly to a single source, human waste is a probable contributor. Human impact on water quality is a crucial concern as the Truckee Meadow's region is forecasted to grow to 120,000+ new residents by 2035. Restrooms are a basic building block of a complete public park. By improving public spaces for everyone, restrooms build community resilience, support social cohesion, increase urban renewal, and improve public health. With less human waste going into the river, everyone will enjoy it more safely and comfortably, potential vectors for infectious disease will be reduced, and the region's water quality will improve.

Summary of Project work in 2018: OTR, TMWA and Keep Truckee Meadows Beautiful (KTMB) joined forces to advance the idea of expanding public restrooms with the City of Reno and the City of Sparks. The Project developed out of an OTR Housing and Sanitation Working Group including local government staff. The Group researched restroom options, explored the Portland Loo in detail and conducted multiple interviews with local cities' staff and elected officials. Proposed timelines, marketing tools, and design plans were given to local government entities. General Project support was garnered. Yet, at the end of 2018, for multiple reasons, both cities felt it was not the right time for their departments to establish more restrooms along the Truckee River. A TMWA-owned property was identified as a possible location for a new restroom along the river.

Summary of Project work in 2019: TRF awarded OTR funding for Project leadership and community engagement activities supporting the Project. In March of 2019, TMWA Board approved the expenditures to install a public restroom on their property near Brodhead Park *(both TRF award and TMWA Board approval subject to the condition to secure another Project partner and develop Project metrics).* OTR staff collected support letters from businesses within the Brodhead Park neighborhood including the Courtyard Marriott and Reno Aces and met with City of Reno police chief Jason Soto about the restroom. Washoe County Regional Parks and Open Space received approval from the state to spend the remaining SQ-1 funding towards the purchase/installation of restrooms. Renown Health awarded TMWA funding to support the Project. OTR partnered with Downtown Reno Partnership to house a River Ambassador hired by Street Plus to conduct outreach to the currently homeless population along the river to support Project success and submitted a proposal to Nevada Division of Environmental Protection (NDEP) to support the position. In August 2019, TMWA Board approved staff to explore restroom installation in Brodhead Park instead of on their property nearby with installation challenges identified by staff, work with the County pertaining to SQ-1 funding, and to use TMWA's $150,000 capital contribution approved in March 2019 for other appropriate Project expenses if needed to move the Project forward. Sept. 2019 Washoe County Health District decided to finically support the pilot Project O&M restroom expenses.

Project Funding Secured as of 9/27/19		
Funder	**Use**	**Amount**
Washoe County Regional Parks and Open Space – SQ-1 funding	Restroom capital *subject to Washoe County and TMWA Board approval*	$286,973
Truckee Meadows Water Authority	Project support	$150,000
Truckee River Fund (TRF) #221	Project oversight, capacity building, and community engagement activities	$107,976
Nevada Division of Environmental Protection (NDEP)	OTR Partnership Coordinator's engagement **currently being used*	$31,200
TRF #221	OTR fiscal agent Nevada Land Trust allotted a portion of their admin funds for TRF #221 to Phase I restroom maintenance	$17,000
Washoe County Health District	Restroom maintenance	$14,000
Renown Health	Restroom maintenance	$13,000
	Total Secured as of 9/27/19	**$620,149**
	Pending proposal to NDEP including a request to support the River Ambassador position	*$32,168*

Restroom Needs Identified along the Truckee River in Nevada ***DRAFT – CONCEPTUAL – FOR PLANNING PURPOSES ONLY – NOT FINAL***				
Number of Restrooms	**Locations where if a public restroom was established could improve river conditions**	**Property Owned By**	**Proposed Phase**	**Basic Funding Required**
1	Brodhead Park	City of Reno	Phase I	$254,974
With success from Phase I				
2	Fisherman's Park II	City Sparks	Phase II	$510,504
3	West Street Plaza	City of Reno	Phase II	
With success from Phase II				
4	City Plaza	City of Reno	Phase III	$861,202
5	Lundsford Park	City of Reno	Phase III	
6	John Champion Park	City of Reno	Phase III	
With success from Phase III				
7	Mayberry Park	Washoe County	Phase IV	$1,047,426
8	Veteran's Parkway river crossing	City Sparks	Phase IV	
9	River bridge just N. of 1-80 on west side of the river in the Wadworth area	Pyramid Lake Paiute Tribe	Phase IV	
			Total	**$2,674,106**
**Listed above is the proposed locations to focus installation. Yet, there are additional locations identified where if a public restroom was established could improve water quality conditions.*				

Funding Required – Phase I – To start Spring 2020					
Expenses	**TMWA Funds Secured**	**County Funds Secured** *(subject to County and TMWA Board approval)*	**Funds Secured by Renown Health and NLT (TRF)**	**Requesting Funding from NDEP**	**Total**
Restroom purchase ($113,250 per restroom x 1 restroom)		$113,250			$113,250
Installation at Brodhead Park at $73,000	$73,000				$73,000
Maintenance ($26,556 per yr. per restroom x 1 restroom) to be carried to Phase II budget		$6,556	$20,000		$26,556
Repair costs ($10,000 per restroom x 1 restroom)			$10,000		$10,000
River Ambassador ($32,168 per 1 part-time staff member x 1 staff)				$32,168	$32,168
Total	**$73,000**	**$119,806**	**$30,000**	**$32,168**	**$254,974**
Phase I received TMWA Board approval to establish a restroom on TMWA-owned property near Brodhead Park, Reno. Due to installation challenges, TMWA and City of Reno staff are now exploring installation in Brodhead Park. A perpetuity of property between City of Reno and TMWA is being developed to establish a restroom at Brodhead Park.					
In addition, auxiliary funding is secured to support the success of Phase I including leadership oversight, capacity building, and community engagement activities equaling $107,976.					

Funding Required – Phase II – Start June 2021 *with funding and perpetuity in place*				
Expenses	**TMWA Funds Secured**	**County Funds Secured** *(subject to County and TMWA Board approval)*	**Requesting Funding**	**Total**
Restroom purchase ($113,250 per restroom x 2 restrooms)		$173,723	$52,777	$226,500
Installation at Fisherman's Park II at $50,000 and West Street Plaza at $60,000	$77,000		$33,000	$110,000
Maintenance ($26,556 per yr. per restroom x 2 restrooms + Phase I restroom expense) to be carried to Phase III budget		$7,444	$72,224	$79,668
Repair costs ($10,000 per restroom x 3 restroom)			$30,000	$30,000
River Ambassador ($64,336 per 1 full-time staff member x 1 staff)			$64,336	$64,336
Total	**$77,000**	**$181,167**	**$252,337**	**$510,504**
A perpetuity between all relevant parties need to be established for properties to install and start Phase II.				

Funding Required – Phase III – Start June 2022 *with funding and perpetuity in place*		
Expenses	**Requesting Funding**	**Total**
Restroom purchase ($113,250 per restroom x 3 restrooms)	$339,750	$339,750
Installation at City Plaza at $100,000, Lundsford at $50,000 and John Champion Park at $60,000	$210,000	$210,000
Maintenance ($26,556 per yr. per restroom x 3 restrooms x 2 restrooms from Phase I and II) to be carried to Phase III budget	$132,780	$132,780
Repair costs ($10,000 per restroom x 5 restroom)	$50,000	$50,000
River Ambassador ($64,336 per 1 full-time staff member x 2 staff)	$128,672	$128,672
Total	**$861,202**	**$861,202**
A perpetuity between all relevant parties need to be established for properties to install and start Phase III.		

Funding Required – Phase IV– Start June 2023 *with funding and perpetuity in place*		
Expenses	**Requesting Funding**	**Total**
Restroom purchase ($113,250 per restroom x 3 restrooms)	$339,750	$339,750
Installation at Mayberry Park at $80,000, Veteran's Parkway at $70,000 and river bridge just N. of 1-80 on west side of the river in the Wadworth area at $100,000 **Wadworth estimate is still in process*	$250,000	$250,000
Maintenance ($26,556 per yr. per restroom x 3 restrooms x 6 restrooms from phase I, II, and III)	$239,004	$239,004
Repair costs ($10,000 per restroom x 9 restroom)	$90,000	$90,000
River Ambassador ($64,336 per 1 full-time staff member x 2 staff)	$128,672	$128,672
Total	**$1,047,426**	**$1,047,426**
A perpetuity between all relevant parties need to be established for properties to install and start Phase IV.		

TRUCKEE MEADOWS WATER AUTHORITY
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STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: John Zimmerman, Water Resources Manager
Laine Christman, Resource Economist and Conservation Supervisor
DATE: October 8, 2019
SUBJECT: **Presentation of analysis of TMWA Rule 7 water demand estimates and discussion and possible action and direction to staff on potential future changes to Rule 7 demand estimates**

SUMMARY

Staff analyzes how much water its customers use each year to evaluate the water right dedication requirements under TMWA Rule 7. The past several years of water usage data for single-family and multi-family customers show a statistically distinct downward pattern of water use on average, which staff believes is permanent. Staff presented the results of this analysis to the State Engineer and he agreed with staff's conclusion and approved a change to the water right dedication formula under Rule 7 (see attached). Staff will present the details regarding the results of the analysis at the Board Meeting and seek approval to move forward with public outreach and a formal rule change.

RECOMMENDATION

Staff recommends the Board adopt a motion to proceed with public outreach according to the below schedule and bring back a formal rule change to the Board for possible adoption after considering all public input.

Public Outreach and Engagement Schedule:

November	Staff would present the rule change to, and consider input from, the TMWA Standing Advisory Committee, the general public through a public workshop, and local developers and other interested stakeholders.
December	First Reading
January	Second Reading and possible adoption

STATE OF NEVADA

STEVE SISOLAK
Governor

BRADLEY CROWELL
Director

TIM WILSON, P.E.
Acting State Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

901 South Stewart Street, Suite 2002
Carson City, Nevada 89701-5250
(775) 684-2800 • Fax (775) 684-2811
http://water.nv.gov

October 4, 2019

Truckee Meadows Water Authority
P.O. Box 30013
Reno, NV 89520-3013

Re: Request to Amend Rule 7 for Single Family Residences

Dear Sir or Madam:

The Division of Water Resources has reviewed your request to change the Truckee Meadows Water Authority Rule 7 dedication rates for single-family residences (SFR).

The existing formula for SFR water right dedication amounts is as follows:

$$Dedication\ Rate = \frac{1\ afa}{1.1 + \frac{10{,}000\ sq.ft.}{Lot\ Size}}$$

The proposed formula for SFR water right dedication amounts is as follows:

$$Dedication\ Rate = \frac{1\ afa}{1.1 + \frac{15{,}000\ sq.ft.}{Lot\ Size}}$$

After examination of the data and assumptions supporting the request, the State Engineer finds that the revised formula is reasonable and is accepted as the means to calculate water demand for SFR for future projects. This new formula only applies prospectively and will not be applied retroactively to existing dedications.

Please contact this office if you have any questions.

Sincerely,

Tim Wilson, P.E.

Tim Wilson, P.E.
Acting State Engineer

TW/mjw/ls

Analysis of TMWA Rule 7 Water Demand Estimates

Oct. 16, 2019

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TMWA Demand Estimating Procedures

Rule 7 controls the volume of water rights that must be dedicated to TMWA for water service

Single Family:	1 ***/*** [1.1 + (10,000/Lot Size in ft^2)]
Condos/Apts/Duplexes:	0.12 acre-feet per unit
Mobile Homes:	0.25 acre-feet per unit
Irrigation:	Turf – 3.41 acre-feet per acre of turf
	Drip – Landscape plans
Commercial:	Best available data and estimating procedures

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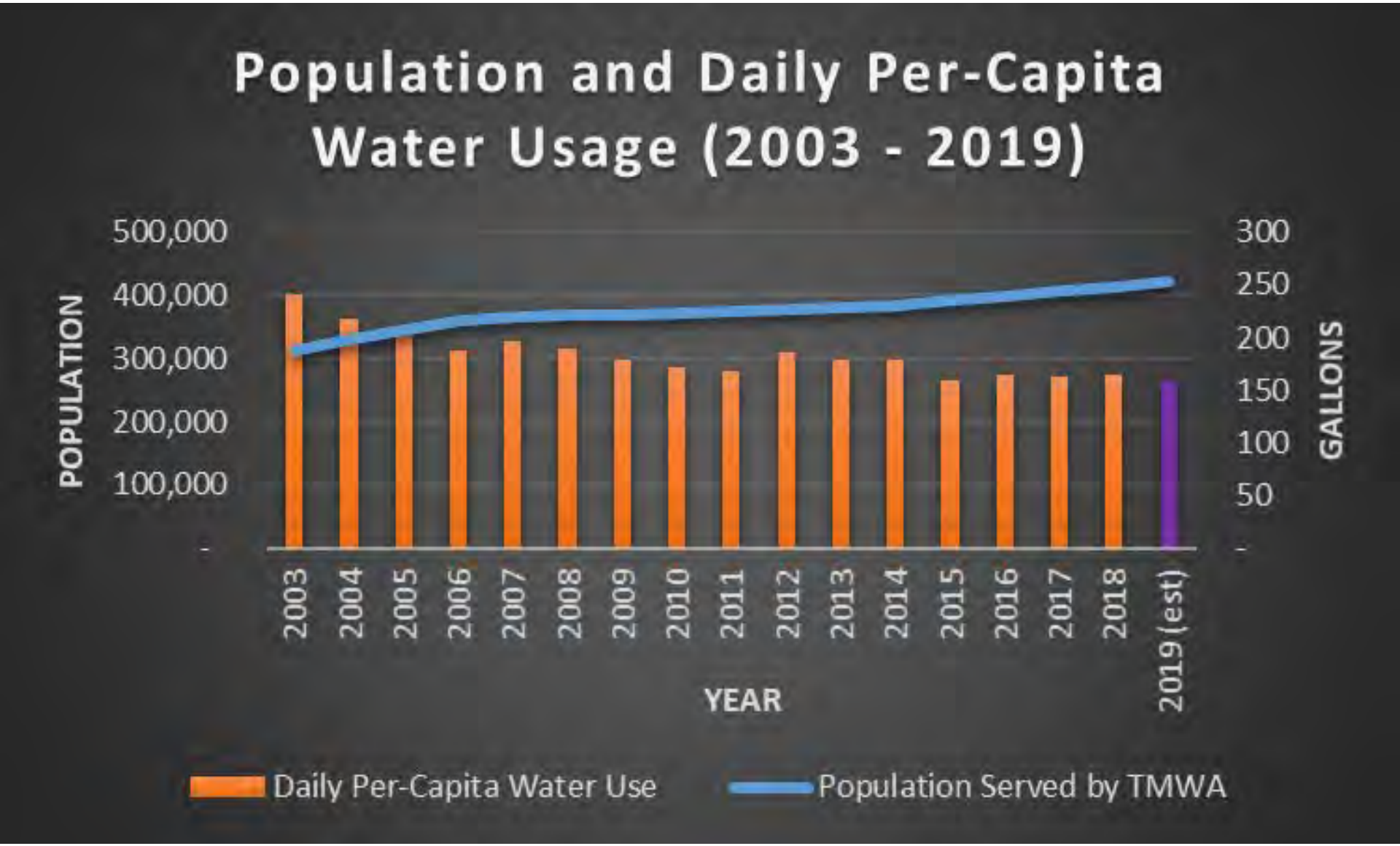
Customer Water Use Trend

Customer Water Use Trend



Single-Family Residential Use Analysis

- Customer Annual Water Use v. Estimated Demand Studied
- TMWA Conducts Analysis Every Year to Check Whether The Existing Rule 7 Demand Formula Accurately Estimates Water Use.
- Analyzed Usage Data For Newer Homes (Built from 2013 – 2015)
  - 2014, 2016, 2017 and 2018 Water Use
  - Omitted 2015 Because TMWA Requested 10% Conservation and Customers Reduced Water Use
  - At Least 3 years of Water Use History To Be Included
    - Ensure Landscaping Is Fully Established
  - Dataset Includes Over 3,000 Services That Are Representative Of Newer Services In TMWA Service Territory
  - Above Services Appear To Be Fundamentally Different Than Older Services

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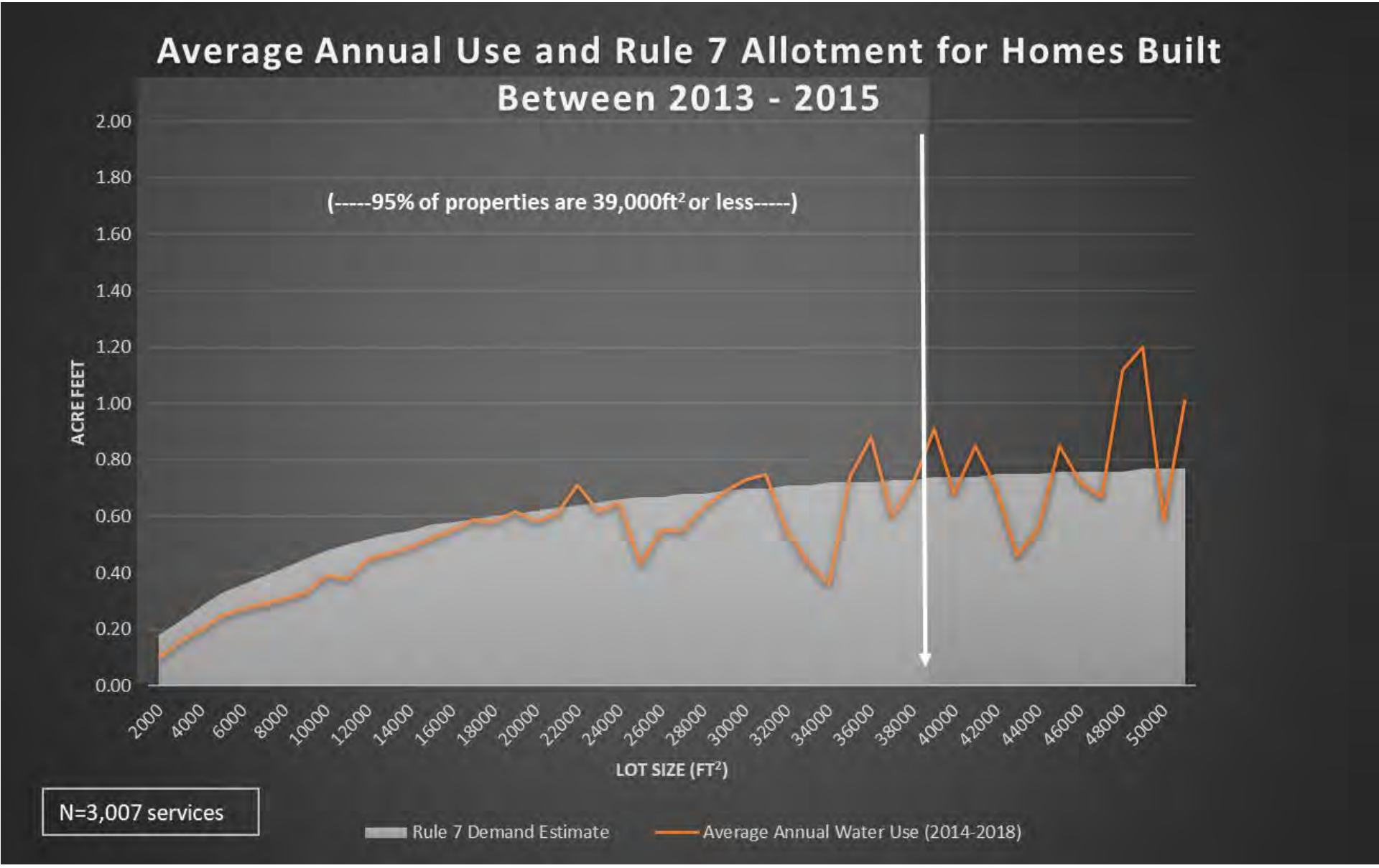
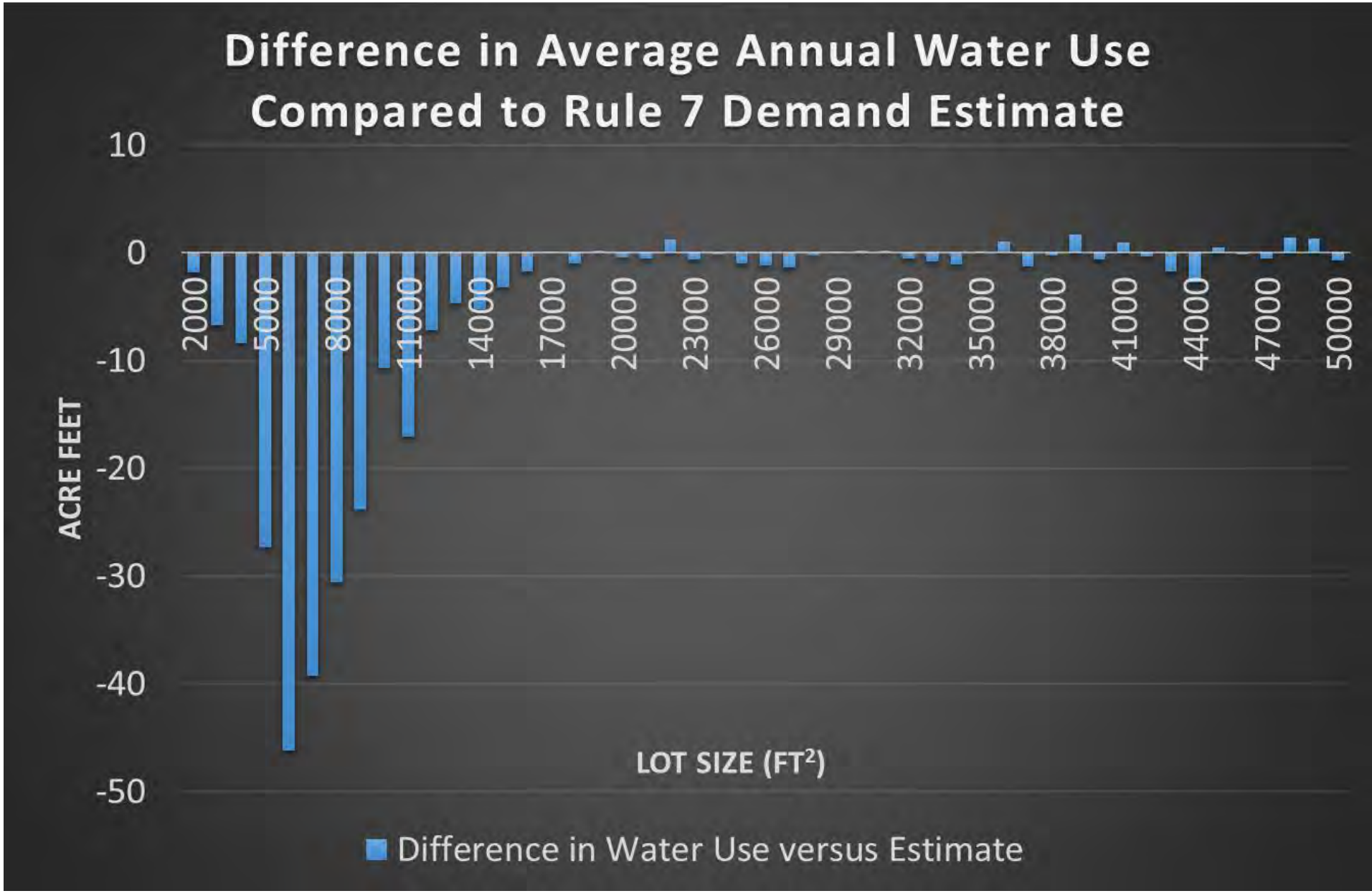
Single-Family Residential Results

On average, newer services use 0.08 acre-feet (18%) ***less*** than demand estimate.



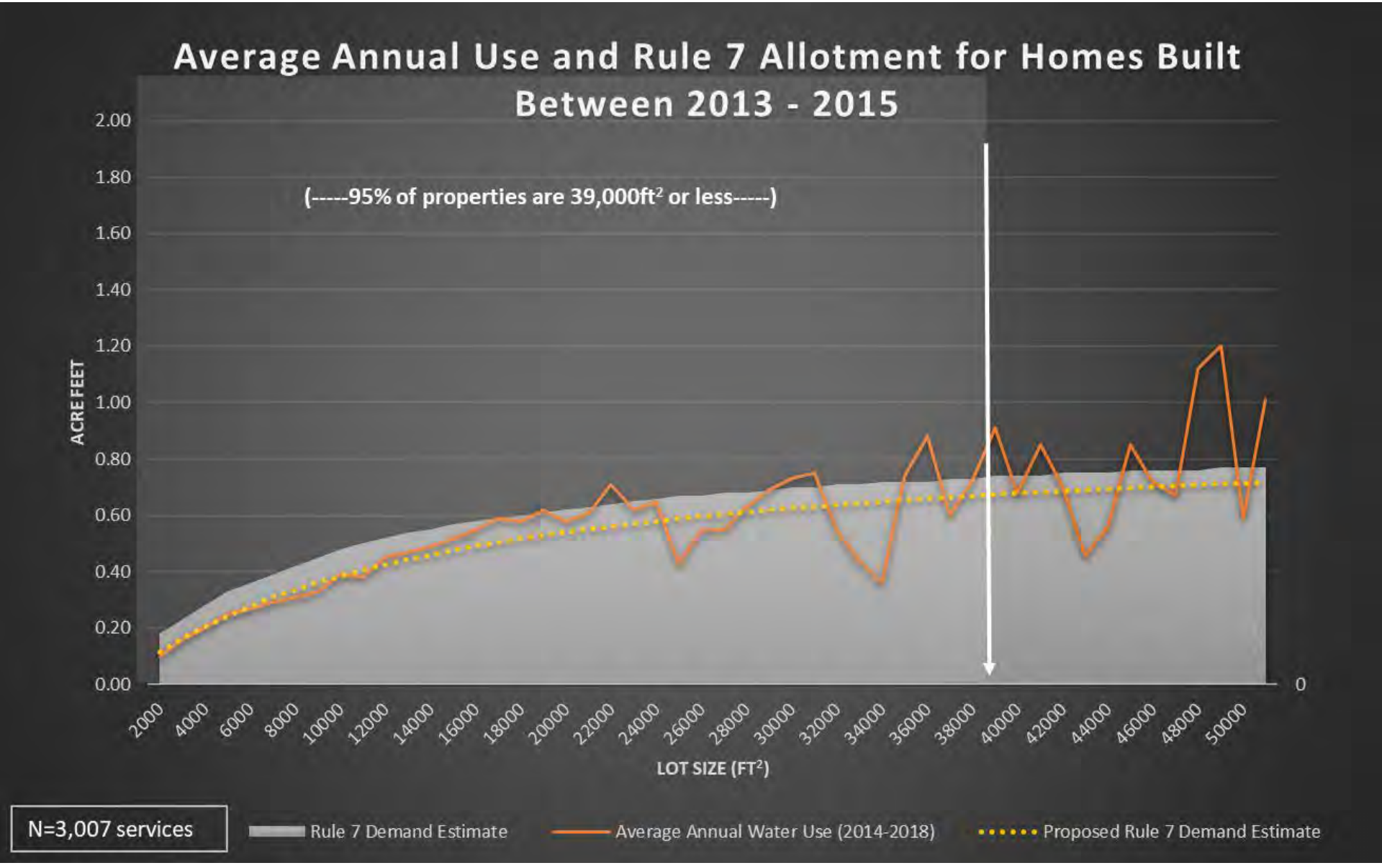
Single-Family Residential Results



Proposed Rule 7 Change

- Current Equation 1 / [1.1 + (10,000/Lot Size SF)]
- Proposed Equation 1 / [1.1 + (15,000/Lot Size SF)]

Proposed Rule 7 Change



Proposed Rule 7 Change

- The difference in estimated demand under the existing Rule 7 equation and the proposed equation can range from 26% for very small lots to 1% for very large lots. The savings to the average lot size is approximately 20%.

Property Size (ft2)	Rule 7 Demand Estimate*	Proposed Rule Estimate*
2000	0.18	0.13
5000	0.36	0.27
10000	0.53	0.42
15000	0.63	0.53
20000	0.69	0.60
25000	0.74	0.65
30000	0.78	0.70
35000	0.8	0.72
40000	0.82	0.75
45000	0.83	0.78
50000	0.85	0.79

*Includes a 0.11 Drought Factor

Proposed Rule 7 Change

- Aligned With Water Use Trends for New Single-Family Services
- Increases the Efficient Use of Water Rights
- Helps with Affordable Housing Concerns by Lowering Total Cost of Housing
- Approved by the Nevada State Engineer for Residential Subdivisions

Multi-Family Residential Use Analysis

- Customer Annual Water Use v. Estimated Demand Studied
- Same Parameters as the Single-Family Analysis
  - 2014, 2016, 2017 and 2018 Water Use
  - Omitted 2015 Because TMWA Requested 10% Conservation and Customers' Reduced Water Use
  - At Least 3 years of Water Use History To Be Included
  - Dataset Includes 82 Services / 1,177 Units That Are Representative Of Newer Services In TMWA Service Territory
  - Above Services Likely Have Greater Efficiencies Than Older Services (newer appliances and fixtures)

Multi-Family Residential Results

- 3-year Average Use for New Multi-Family Services is 0.11 AF per Unit
- Current Rule 7 Estimate is 0.12 AF per unit
- Difference of 0.01 AF per unit
- Proposed Rule 7 Change is to Lower the Estimate to New 3-year Average of 0.11AF

Proposed Schedule

October Present to TMWA Board for Input and Direction

November Public Outreach

- TMWA Citizens Standing Advisory Committee
- General Public Open House
- Builders Association of Northern Nevada

December TMWA Board First Official Reading

January TMWA Board Second Official Reading/Adoption

Thank you!

Questions?

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STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: John Zimmerman, Water Resources Manager
Pat Nielson, Distribution, Maintenance and Generation, Director
DATE: September 10, 2019
SUBJECT: **Discussion and possible direction to staff regarding parameters for the sale of the Farad Property**

SUMMARY

The Board directed staff to put an item on the September Board meeting agenda regarding certain parameters related to the sale of the Farad property, to include: exploring the possibility of an economic development sale, contracting with a real estate broker to assist with the sale, setting a minimum bid amount, and providing clarity on the Truckee River water right associated with Farad. The following is a brief update regarding the sale of the Farad property and a list of the items to discuss if the property is not sold at the September Board meeting.

Update on Property Sale

At the August Board meeting Bill Black offered $63,000 to purchase the property, which bid the Board rejected. Shortly after the Board meeting Mr. Black told staff that he was willing to increase his bid to purchase the property and has since submitted a bid of $127,500. Accordingly, in case the Board was willing to accept Mr. Black's new bid, staff proceeded to re-notice the sale hearing to allow the Board to consider the bid at the September Board meeting. The sale is subject to the same terms and conditions as discussed at the August Board meeting. In addition to again publishing and posting the notice of sale as required by TMWA policy, staff also notified everyone who submitted their contact information and those who had previously expressed an interest in the property. To date, no one other than Mr. Black has submitted a bid.

Parameters to Discuss if the Property is not Sold

If the Board rejects all bids, then the following parameters should be discussed to determine the next steps to proceed with the sale of the property.

1. Selling the property outside the bid process to an entity for economic development;
2. Engaging a real estate broker to assist with selling the property;
3. Setting a minimum bid; and
4. Allowing the buyer to lease the Farad water right for hydroelectric purposes.

TRUCKEE MEADOWS WATER AUTHORITY
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STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: Pat Nielson, Distribution, Maintenance and Generation, Director
John Zimmerman, Water Resources Manager
DATE: October 8, 2019
SUBJECT: **Public Hearing, consideration of written bids and consideration of possible oral bids for sale of Farad property and discussion and possible action regarding approval of sale or other disposition of Farad property consisting of approximately 111 acres in Nevada County, California generally referred to as Assessor's Parcels 48-030-14, 48-050-01, 48-050-10, 48-060-07, 48-040-02 and 48-130-04**.

SUMMARY

At the September Board meeting, a motion to sell the Farad property to Bill Black for $127,500 failed to pass by virtue of a tie vote. The Board then voted to approve member Anderson's motion to hire a broker to help market the property and to list it with the broker for six months before bringing back any offers to the Board for consideration. After the Board meeting, member Anderson made a request to the Chair and General Manager that his motion to hire a broker and the motion to sell the property be placed on the October 16 Board meeting agenda for reconsideration. Accordingly, staff published, posted, and noticed the notice of sale in the same manner as the previous two notices. For the Board's reference, attached to this report is a timeline of the sale and public notice process.

In the event the Board elects to reconsider the motion to sell the property, this agenda item is property styled so the Board may receive oral bids (if any) and take action on the possible sale of the property at the October 16th meeting on the terms previously noticed.

The only current responsive offer to purchase the property received to date is $127,500 from Mr. Black. Navitas Companies, the entity that bid $21,000 in August, has proposed general terms for negotiating a possible joint venture with TMWA to rebuild the hydroelectric facility, including the diversion dam, wooden flume, forebay, and powerhouse. However, Navitas' proposal does not comply with the Board's direction to sell the property and does not appear in TMWA's best interests as it would require TMWA to contribute all land and water rights associated with the Farad property, contribute $1M in cash to finance a feasibility study, encumber the property with significant additional debt, and maintain all liability associated with ownership, while reserving to Navitas certain rights to exit as feasibility is evaluated.

Furthermore, staff has previously determined that rebuilding the facilities and restoring hydrogeneration is not financially justifiable at this time, or in the foreseeable future, further weighing against the viability of the proposal. For these reasons, the Navitas proposal is nonresponsive to the sale terms proposed and should not be considered under this agenda item.

Summary of Farad Meetings and Public Engagement Efforts

2017	October TMWA Board Meeting; Board Directed Staff to Seek Public Input on Future of Property
2018	
January	Posted, Published, and Sent Request for Statements of Interest
February	Gave Tour of Farad Property to Interested Parties; Presented to TMWA Standing Advisory Committee
April	TMWA Board Meeting; Presented Summary of Statements of Interest Received from the Public
May	Met with Nevada County on potential interest in property and planning and zoning restrictions
June	TMWA Board Meeting; Presented Summary of Nevada County Zoning Restrictions and Appraisal Cost
	TMWA Standing Advisory Committee Meeting; Presented Status Update
September	TMWA Standing Advisory Committee Meeting; Presented Status Update
October	TMWA Board Meeting; Presented General Manager goal to continue discussions with Truckee-Donner Land Trust and return a recommendation to the Board
2019	
February	Sent Proposed Letter of Intent to Truckee-Donner Land Trust to Acquire the Property
April	TMWA Board Meeting; Presented Status Update in the General Manager Report
June	TMWA Board Meeting; Presented Status Update; Published, Posted, and Sent Notice of Sale
August	First Board Sale Hearing; Published, Posted, and Sent Notice of Sale
September	Second Board Sale Hearing; Published, Posted, and Sent Notice of Sale
October	TMWA Standing Advisory Committee Meeting; Presented Status Update

Publications: Reno-Gazette Journal, Nevada Appeal, Tahoe Daily Tribune, The Record-Courier, Tahoe World, Sierra Sun, Lahontan Valley News & Fallon, Sacramento Bee (July notice of sale), and San Francisco Chronicle (July notice of sale)

Posted: City of Reno, City of Sparks, Washoe County, and TMWA

Notices Sent To: TMWA SAC members
Town of Truckee
Nevada County Supervisor
California Legislative District 1 Senator
California Dept. of Fish and Wildlife
California Dept. of Natural Resources
Federal Water Master
Bureau of Reclamation
Sierra County Manager
United States Forest Service
Truckee River Fund, Board of Advisors
Nature Conservancy, Mickey Hazelwood, Michael Cameron
One Truckee River, Christi Cakiroglu
Patagonia, Gregor Finke
Comm. Found. of Northern Nevada, Chris Aksin
Truckee Donner Land Trust, Perry Norris
Sierra Club, Dennis Ghiglieri
California Council of Land Trusts, Ane Diester
Truckee River Watershed Council, Lisa Wallace
Tahoe-Pyramid Trail, Janet Phillips
Walton Foundation, Ted Kowalski
Carson-Truckee Subconservancy District, Ed James
Washoe County Water Cons. District, Robert Quilici
American Energy, Scott Goodwin
Nevada Land Trust, Alicia Reban

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STAFF REPORT

TO: TMWA Board of Directors
THRU: Mark Foree, General Manager
FROM: Michele Sullivan, Chief Financial Officer/Treasurer
DATE: September 25, 2019
SUBJECT: **Presentation of and discussion, and possible direction to staff regarding preliminary funding plan for Fiscal Years 2020 through 2024**

Recommendation

Recommendation to consider processing the next rate increase of 2.5% scheduled for May, 2020 with a final vote by the Board of Directors (BOD) at their scheduled meeting in January or February of 2020, and maintain the possibility of two rate increases in May of 2021, and 2022 at a maximum of 2.5% each. Continue to monitor the closing of the funding gap between recurring revenues and the cost of servicing TMWA customers, based on the Funding Plan annually. Staff presented the preliminary funding plan to the Standing Advisory Committee (SAC) on October 1, 2019 and SAC voted to support staff's recommendation to process the 2.5% increase in May, 2020.

Summary

At the April, 2017 TMWA Board meeting, the TMWA BOD approved Resolution No. 250 which included rate increases of 3% in May, 2017 and May, 2018 with additional rate increases of 2.5% in May, 2019 through 2021 to be brought for reconsideration to the SAC and BOD before they are implemented, so that they can be thoroughly vetted. Principal payments on Senior Lien debt were deferred in the 2016 Bond Refunding to give TMWA time to bring rates in line with cost of service. Annual principal payments averaging $11 million annually will resume in 2020, and should be covered by recurring revenue, which is mainly water sales. Increases of 3% in May of 2017 and 2018 were implemented, and the 2.5% rate increase scheduled for May, 2019 was deferred for one year.

The 2020-2024 Draft Funding Plan shows that rate adjustments are still necessary to close the funding gap between recurring revenues and the cost of servicing the customer base. Increases in water sales revenues, hydroelectric and other operating revenues, and investment earnings have helped to close some of the funding gap. Water flows in the Truckee River are projected to be

sufficient to operate hydroelectric plants at near capacity levels, but required maintenance will need to be performed which will take them out of service for periods of time. Higher than anticipated cash balances resulted in higher than originally anticipated investment earnings. One time cash windfalls of $21.4 million from an insurance settlement related to Farad, and $9.5 million from banks for releasing them from Forward Delivery Agreements have placed TMWA in a strong cash position; However, closing the funding gap still needs to occur to ensure TMWA can maintain critical financial goals which are essential to maintain adequate cash balances and investment grade credit ratings.

Discussion

A survey performed by American Water Works Association (AWWA) of 318 water utilities nationwide showed that from 1996 to 2012, the average residential price of water (excluding wastewater) climbed 4.9% per year compared to an annual growth of 2.5% in general CPI, or almost twice CPI. The study also identified an average rate increase between July 2012 and July 2014 of 9.5%. The following graph published by the U.S. Bureau of Labor Statistics shows the water and sewage CPI compared to all in CPI.

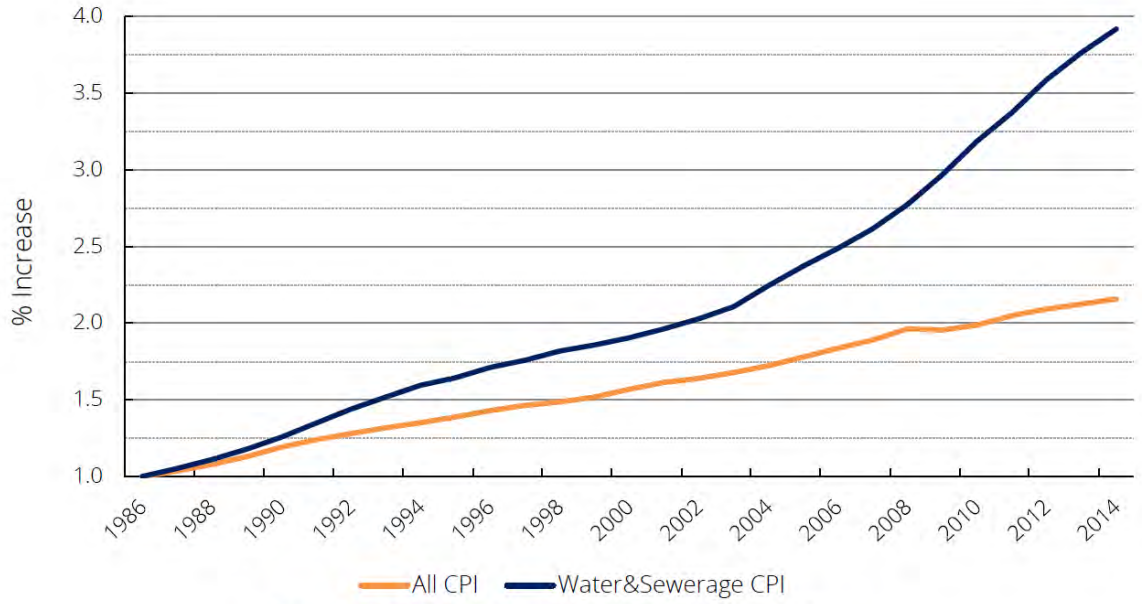


Figure 3.1 CPI for Water Rates versus CPI for All Items
Source: U.S. Bureau of Labor Statistics, http://www.bls.gov/cpi/data.htm

TMWA rates over the past 10 years have increased six times, with an average increase of 3.63%, and an average annual increase of 2.18%, which is considerably lower than the CPI for water, and slightly lower than all in CPI. Fitch ratings recently awarded TMWA an upgrade in ratings to AA- from A+, with an improved outlook of Positive from Stable. They state that "rates are low relative to median household income, suggesting the district has adequate flexibility to

implement possible inflation-like rate increases over the next several years." Fitch's affordability threshold is 1% of median household income and TMWA's bill equates to 0.7% as of 2018. They also note that if TMWA implements inflation-like rates, we will remain within their measure for affordability.

The last rate increase implemented was in May, 2018. Since then the all in CPI has increased by 2.3% from June, 2018 to August, 2019. CPI for water and sewer has increased 4.1%. If TMWA can stay in line with lower inflation-like rate increases it will best meet its financial objectives. CPI should be above 2.5% for the two-year period ended May, 2020, therefore, a rate increase of 2.5% in May, 2020 is advised by staff. If CPI starts to reduce, we would recommend using a lower rate increase. This can be reconsidered early next year.

Critical financial goals for TMWA that need to be considered in these funding plans are as follows:

- Maintain recurring revenues sufficient to cover the cost to serve customers.
- Maintain a senior lien coverage (DSC) ratio that not only meets bond covenants (1.25x) but also meets the board designated goal of 1.5x.
- Maintain sufficient cash balances to facilitate the payment for rehabilitative capital projects on a pay-go basis.
- Maintain high investment grade credit ratings to effectively access the credit markets.

The Draft Funding Plans analyze the ability of TMWA to fund the cost to serve customers which includes operating expenses, principal and interest payments on current outstanding debt related to customers, and all capital improvements presented in the TMWA 2019-2023 Capital Improvement Plan (CIP) that relate to maintaining service for current customers from recurring revenues. Recurring revenues are comprised of water sales, hydroelectric revenues, other miscellaneous operating revenues and investment income with water sales making up anywhere from 90 to 95% of recurring revenues. If recurring revenues are less than the cost to serve customers this is referred to as a funding gap.

This high-level presentation is based upon very detailed financial projections. Assumptions used in these financial projections can be found in ***Attachment C***.

Over the last three years, revenue has rebounded somewhat from drought levels. Compared to original projections in 2017, when the rate increase was adopted, water sales revenue for FY2019 was $1.0 million or 1.0% higher than the funding plan projection used at that time, even with the deferral of the 2.5% increase last year. It is uncertain whether this trend will continue. Hydroelectric revenues are expected to remain solid for several years due to sufficient Truckee River flows, but this could also change later in the funding plan period. TMWA had several one-time cash infusions from insurance proceeds for the Farad Hydro diversion, and settlements on release of forward delivery agreements totaling over $30 million. This additional cash gives TMWA time to reduce the funding gap, but current projections show that much of this cash will

be used to pay down debt principal when the debt service increases by $11 million annually in 2020.

The Draft Funding Plans found in ***Attachment A-1*** and ***A-2,*** present the financial metrics and disparity between recurring revenues and the cost to serve customers. ***Attachment A-1*** projects financial performance metrics if the next increase is not implemented. ***Attachment A-2*** projects financial performance metrics with the three approved increases beginning in May, 2020.

Critical metrics for TMWA are projected as follows related to ***Attachment A-1***:

- TMWA's revenue deficiency as a combined utility increases to $11.4 million and 9.1% in 2020 when principal payments on Senior Lien debt resume. Recurring revenue is below cost of service by 4.1% after two rate increases.
- Unrestricted cash balances decline significantly beginning in 2021 and fall below required levels based on TMWA's Reserves Policy which are needed to maintain investment grade credit ratings by 2023.

In ***Attachment A-2*** the funding plan from ***Attachment A-1*** is shown with all three approved 2.5% rate increases implemented, which strengthens TMWA's DSC calculations and better preserves cash balances.

Critical metrics for TMWA are projected as follows:

- Recurring revenue is within 1.9% of projected cost of service by 2023.
- TMWA maintains an adequate DSC ratio.
- Unrestricted cash balances are maintained at levels sufficient to maintain investment grade credit ratings and meet required cash reserves based on TMWA's Reserves Policy.

TMWA management will continue with strong cost control measures, as demonstrated over past years. The 3% increases approved by the board in May of 2017 and 2018 have put TMWA in a better position to address increased principal payments on debt in 2020. At this time, staff recommends implementing the 2.5% increase in May, 2020, and revisiting the increases in May, 2021 and 2022 to consider implementation.

Truckee Meadows Water Authority
2020-2024 Funding Plan with Delayed Rate Increases

TMWA's Revenue Sufficiency and Cost of Service	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Projected Rate Increases	**0.0%**	**2.5%**	**2.5%**	**0.0%**	**0.0%**
Operating Expenses	$ 64,696,259	$ 64,983,724	$ 65,633,489	$ 66,789,307	$ 68,518,656
Principal and Interest on customer related debt	29,102,896	28,221,433	28,602,175	28,531,333	28,465,258
Rehabilitative Capital Spending	30,675,000	30,675,000	30,675,000	30,675,000	30,675,000
Total Projected Cost of Service	**$ 124,474,155**	**$ 123,880,157**	**$ 124,910,664**	**$ 125,995,640**	**$ 127,658,914**
Recurring Revenues	**$ 113,101,031**	**$ 114,420,023**	**$ 117,697,192**	**$ 120,777,872**	**$ 122,409,402**
Surplus (Deficiency)	**$ (11,373,124)**	**$ (9,460,134)**	**$ (7,213,472)**	**$ (5,217,768)**	**$ (5,249,512)**
Surplus (Deficiency) as a % of Cost of Service	**-9.1%**	**-7.6%**	**-5.8%**	**-4.1%**	**-4.1%**

Debt Service Coverage Ratios	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Water Sales Revenues	102,508,086	104,781,095	108,456,053	111,632,442	112,477,556
Hydroelectric Sales	3,664,180	3,100,000	2,800,000	2,500,000	3,000,000
Other Operating Sales	3,518,950	2,673,823	2,331,513	2,269,902	2,263,820
Investment Income	3,409,815	3,865,105	4,109,626	4,375,528	4,668,026
Total Revenues	113,101,031	114,420,023	117,697,192	120,777,872	122,409,402
Operating Expenses	(66,633,759)	(64,983,724)	(65,633,489)	(66,789,307)	(68,518,656)
Net Revenues	46,467,272	49,436,299	52,063,703	53,988,565	53,890,746
Senior Lien Debt Service	28,185,550	27,829,750	28,275,250	28,274,500	28,287,250
Senior Lien DSC	**1.65**	**1.78**	**1.84**	**1.91**	**1.91**
Total Sr. Lien and SRF Debt Service	30,606,271	30,250,471	30,695,971	30,695,221	30,707,971
Total Sr. Lien and SRF DSC	**1.52**	**1.63**	**1.70**	**1.76**	**1.75**
Total Annual Debt Service incl. TECP Interest	31,358,959	30,479,829	30,864,842	30,794,938	30,732,821
Total Subordinate DSC	**1.48**	**1.62**	**1.69**	**1.75**	**1.75**

TMWA's Cash Balances	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Restricted Cash	**$ 53,409,093**	**$ 50,398,778**	**$ 50,965,363**	**$ 51,790,650**	**$ 52,637,426**
Rate Stabilization Fund	**9,171,715**	**9,746,088**	**9,976,982**	**10,124,142**	**10,203,237**
Unrestricted Cash Required by Policy	**94,242,472**	**93,692,460**	**93,909,048**	**94,294,320**	**94,870,770**
Required Cash Balances	**156,823,280**	**153,837,325**	**154,851,392**	**156,209,112**	**157,711,433**
Total Cash Balance	**193,128,755**	**181,638,514**	**168,325,456**	**157,068,015**	**149,343,361**
Difference	**$ 36,305,475**	**$ 27,801,189**	**$ 13,474,064**	**$ 858,903**	**$ (8,368,072)**

ATTACHMENT A-1

Truckee Meadows Water Authority
2020-2024 Funding Plan with Delayed Rate Increases

TMWA's Revenue Sufficiency and Cost of Service	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Projected Rate Increases	**2.5%**	**2.5%**	**2.5%**	**0.0%**	**0.0%**
Operating Expenses	$ 64,696,259	$ 64,983,724	$ 65,633,489	$ 66,789,307	$ 68,518,656
Principal and Interest on customer related debt	29,102,896	28,221,433	28,602,175	28,531,333	28,465,258
Rehabilitative Capital Spending	30,675,000	30,675,000	30,675,000	30,675,000	30,675,000
Total Projected Cost of Service	**$ 124,474,155**	**$ 123,880,157**	**$ 124,910,664**	**$ 125,995,640**	**$ 127,658,914**
Recurring Revenues	**$ 114,083,173**	**$ 117,069,663**	**$ 120,468,851**	**$ 123,603,831**	**$ 125,256,888**
Surplus (Deficiency)	**$ (10,390,982)**	**$ (6,810,494)**	**$ (4,441,813)**	**$ (2,391,809)**	**$ (2,402,026)**
Surplus (Deficiency) as a % of Cost of Service	**-8.3%**	**-5.5%**	**-3.6%**	**-1.9%**	**-1.9%**

Debt Service Coverage Ratios	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Water Sales Revenues	103,490,228	107,430,735	111,227,712	114,458,401	115,325,042
Hydroelectric Sales	3,664,180	3,100,000	2,800,000	2,500,000	3,000,000
Other Operating Sales	3,518,950	2,673,823	2,331,513	2,269,902	2,263,820
Investment Income	3,409,815	3,865,105	4,109,626	4,375,528	4,668,026
Total Revenues	114,083,173	117,069,663	120,468,851	123,603,831	125,256,888
Operating Expenses	(66,633,759)	(64,983,724)	(65,633,489)	(66,789,307)	(68,518,656)
Net Revenues	47,449,414	52,085,939	54,835,362	56,814,524	56,738,232
Senior Lien Debt Service	28,185,550	27,829,750	28,275,250	28,274,500	28,287,250
Senior Lien DSC	**1.68**	**1.87**	**1.94**	**2.01**	**2.01**
Total Sr. Lien and SRF Debt Service	30,606,271	30,250,471	30,695,971	30,695,221	30,707,971
Total Sr. Lien and SRF DSC	**1.55**	**1.72**	**1.79**	**1.85**	**1.85**
Total Annual Debt Service incl. TECP Interest	31,358,959	30,479,829	30,864,842	30,794,938	30,732,821
Total Subordinate DSC	**1.51**	**1.71**	**1.78**	**1.84**	**1.85**

TMWA's Cash Balances	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Restricted Cash	**$ 53,409,093**	**$ 50,398,778**	**$ 50,965,363**	**$ 51,790,650**	**$ 52,637,426**
Rate Stabilization Fund	**9,171,715**	**9,993,505**	**10,230,335**	**10,024,692**	**9,660,631**
Unrestricted Cash Required by Policy	**94,242,472**	**93,692,460**	**93,909,048**	**94,294,320**	**94,870,770**
Required Cash Balances	**156,823,280**	**154,084,743**	**155,104,745**	**156,109,661**	**157,168,826**
Total Cash Balance	**194,110,897**	**185,270,296**	**174,728,897**	**166,297,415**	**161,420,247**
Difference	**$ 37,287,617**	**$ 31,185,553**	**$ 19,624,152**	**$ 10,187,754**	**$ 4,251,421**

ATTACHMENT A-2

2020-2024 Draft Funding Plan Assumptions

Operational Assumptions

1) Reliance on surface water will continue due to improved weather patterns with groundwater supplies augmenting the surface water treatment plants.

2) Fish Springs Ranch (Vidler) groundwater will be made available to the North Valleys reducing reliance on groundwater in the Lemmon Valley Basin. Water flow will be maintained to optimize water quality.

3) The Mt. Rose/Galena Surface Water Treatment Plant operational in fiscal year 2021 with operating costs assumed to be $1000 per mgal with total annual production of 750mg.

Revenue/Capital Contribution Assumptions

1) The Draft Funding Plan anticipates an additional 6,477 service connections over the five-year period. Growth in service connections is slightly lower than growth projections presented in the Draft 2016-2035 Water Resource Plan and the prior year's funding plan. Growth percentage goes from 1.51% in 2020, decreasing to 0.81% in 2024. Usage is based on patterns over the last several years.

2)Hydroelectric sales projections are based on higher river flows in 2020 through 2022, and median river flows in 2023 and 2024. Downtime for construction and maintenance of hydro plants is considered.

3) Weighted average yield on investable cash is estimated to be 1.84% in fiscal year 2020 rising to 2.50% in fiscal year 2024. These yields are slightly lower than the prior year's funding plan.

4) Will serve sales are expected to be approximately $19.4 million over the ensuing period, and will be used to pay down commercial paper balances.

5) Other developer contributions are projected to be $55.7 million over the ensuing period. This does not include any significant funding to expand a water main to Verdi.

Operating Expense Assumptions

1) Wages and salaries increase for IBEW workers are based on the latest contract with the union or 3% in 2020, and 2021. Thereafter, IBEW increases are budget at 2.0%. MPAT employees increase by 2.75% annually in 2020 and 2021, 2.5% in 2022 and 2.0% in 2023 and 2024.

2) Headcount was increased by seven in the 2020 budget and is projected to increase by seven in 2021, and two in 2022. Headcount will decrease by four in 2023 and by another four in 2024 as retirements occur.

3) Public Employee contribution rates are assumed to remain at 29.25% in fiscal year 2020 through 2022, and increase to 30.5% in fiscal year 2023 through 2024.

4) Health care premiums and life insurance premiums are assumed to increase 3% annually. No change to employer/employee allocation of costs.

5) Workmen's compensation premiums assumed to increase 3% annually.

6) Funding for the Truckee River Fund is $850k in 2020-2024.

7) TMWA's anticipated share of TROA administration expenses is approximately $360k annually beginning in FY 2020.

8) General annual inflation of 2.0% is assumed on most service and supplies, with the exception of chemicals, ditch and storage fees which are assumed to increase 3% annually.

Debt Management Assumptions

1)Tax-exempt commercial paper interest rates are assumed to be 1.5% in fiscal year 2020 increasing to 1.9% in fiscal year 2023. Payments of $23.5 million are assumed based on will-serve sales and other revenue to reduce commercial paper to a zero balance before the end of the five-year period.

2) No new debt is assumed to be issued during the 2020-2024 period.

3)Debt service on developer related funding is assumed to be funded by developer fees.

Treasury Assumptions

1) Total cash and investments at the beginning of fiscal year 2020 are $197.8 million. Of this total $152.9 million is unrestricted.

2) Restricted reserves that were transferred from the South Truckee Meadows General Improvement District (STMGID) are sufficient to fund capital improvements in this former service area through 2021.

3) Customer funded capital spending from the five year CIP plan is spread evenly over the five year period to avoid fluctuations in the funding gap. Implementation of a new remote read meter system is planned during the period, and adds approximately $11 million to the CIP plan.

TMWA

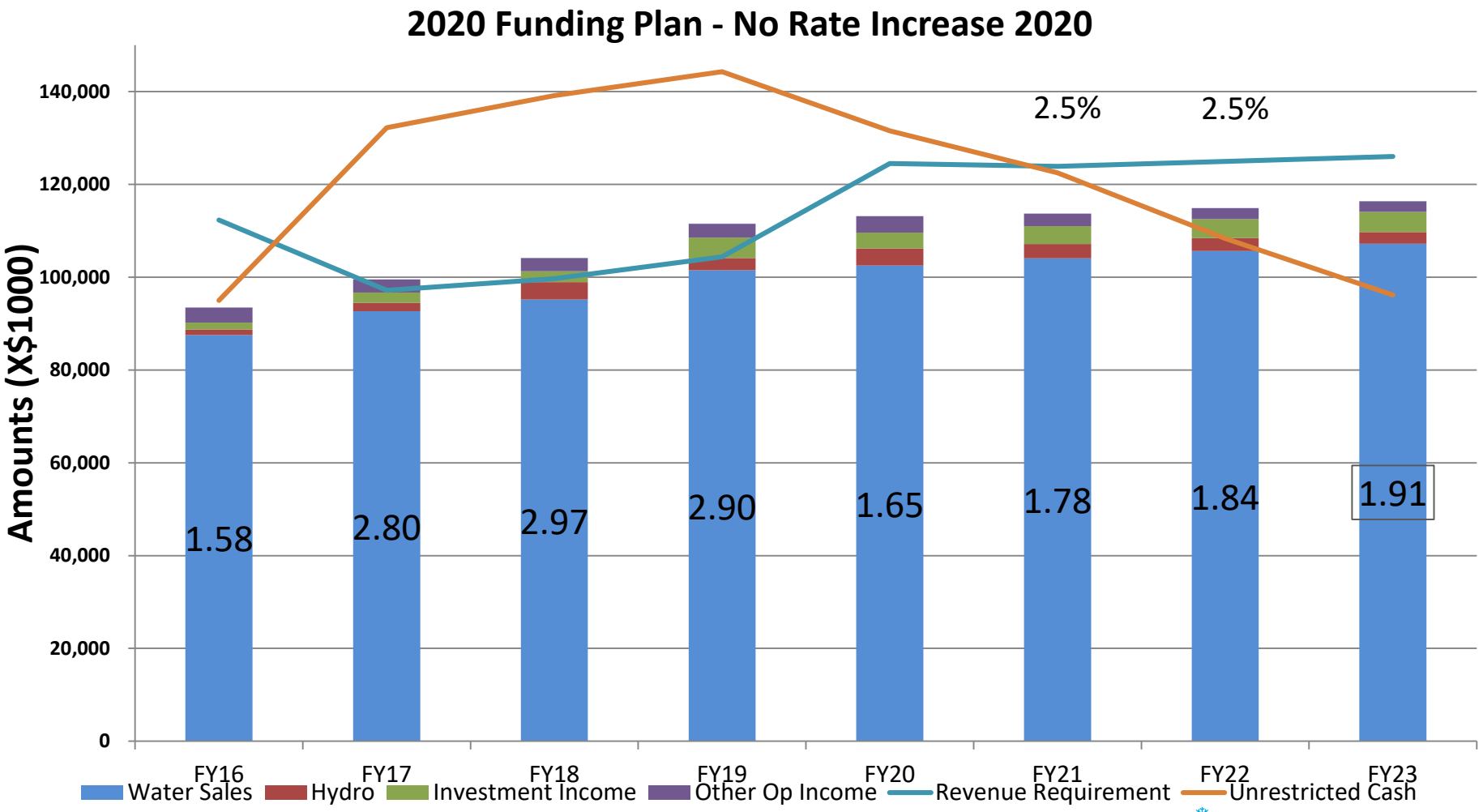
Financial Metrics Related to Draft Funding Plan 2020-2024

TRUCKEE MEADOWS WATER AUTHORITY

Quality. Delivered.

Truckee Meadows Water Authority (TMWA)

Financial Metrics 2016 - 2023 (Attachment A-1)



TRUCKEE MEADOWS WATER AUTHORITY
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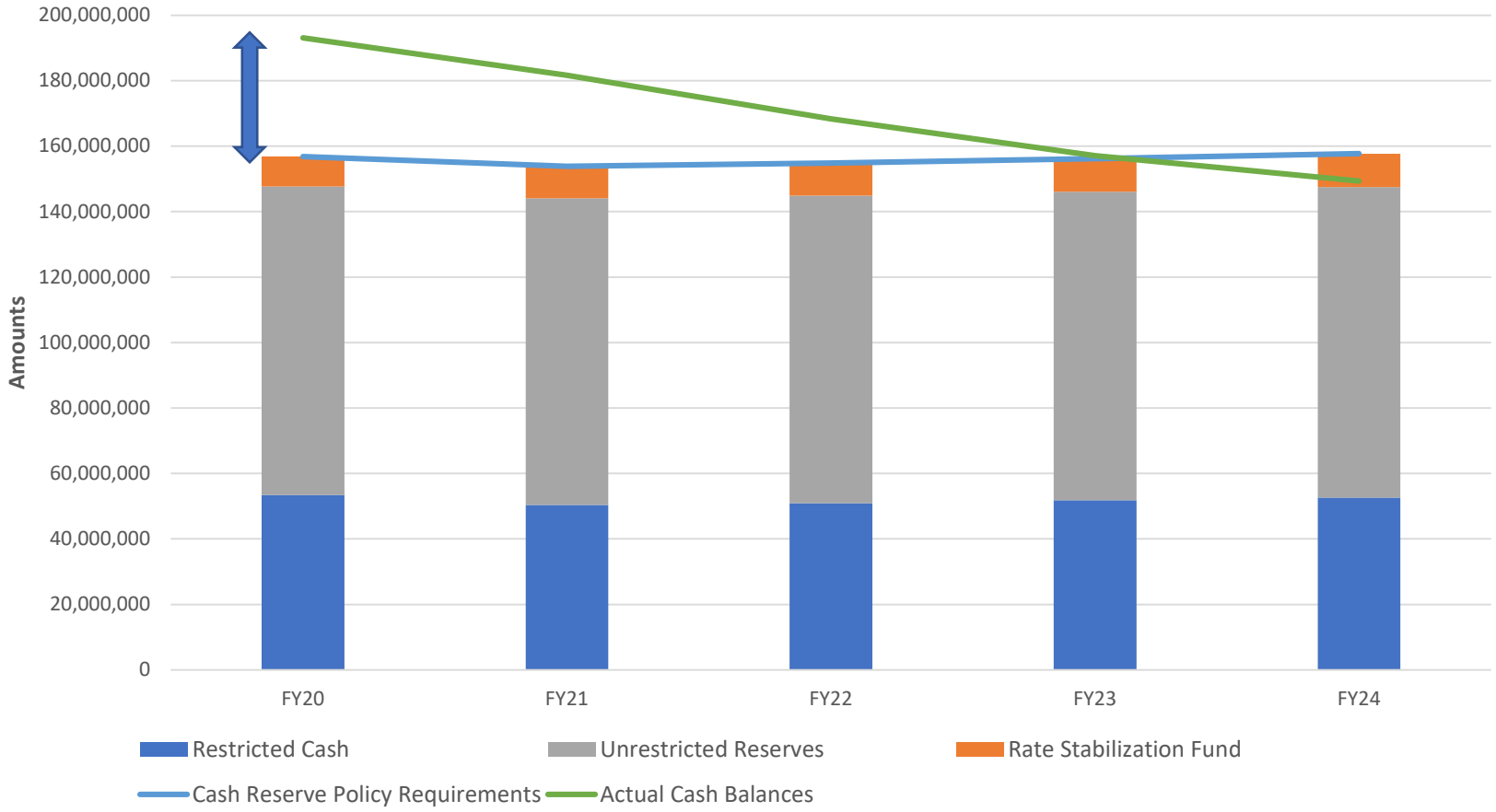
Truckee Meadows Water Authority (TMWA)

Cash Balance Attachment A-1



Arrow indicates current excess cash balances due to one time events

TRUCKEE MEADOWS WATER AUTHORITY
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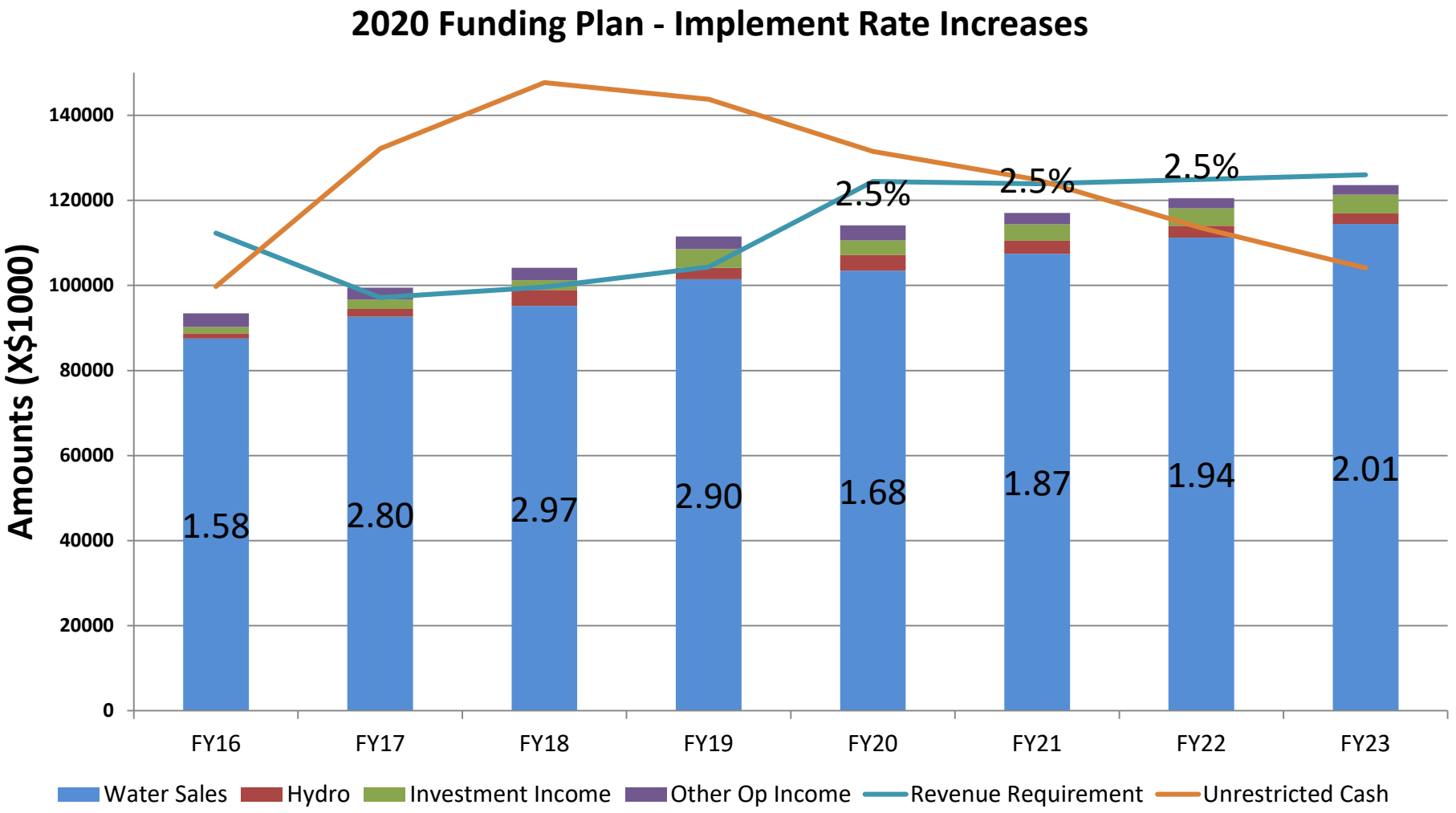
Truckee Meadows Water Authority (TMWA)

Financial Metrics 2016 - 2023 (Attachment A-2)



TRUCKEE MEADOWS WATER AUTHORITY
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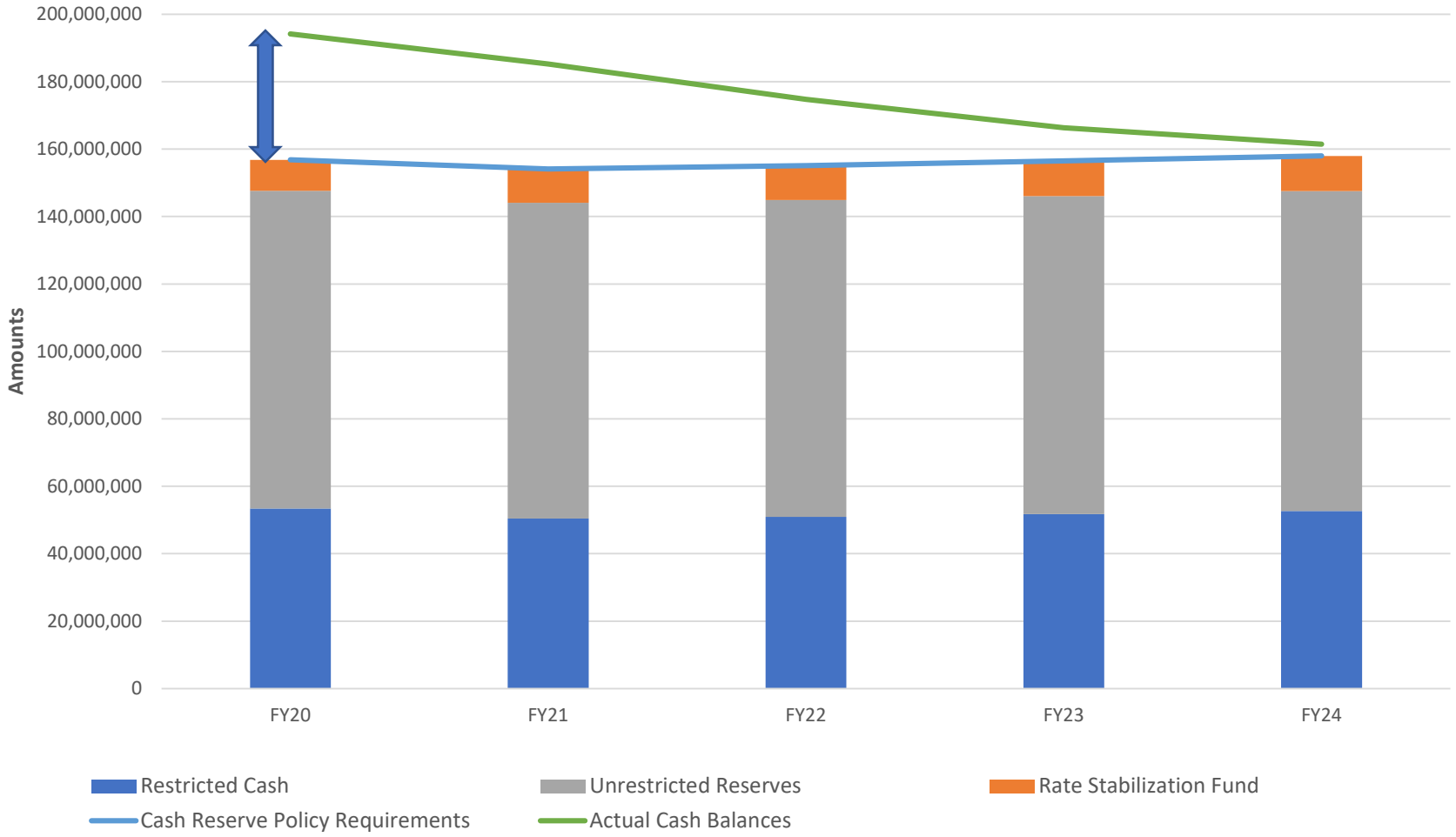
Truckee Meadows Water Authority (TMWA)

Cash Balances Attachment A-2



Arrow indicates current excess cash balances due to one time events

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Thank you!

Questions?

Michele Sullivan, CFO
Email: msullivan@tmwa.com

TRUCKEE MEADOWS WATER AUTHORITY

STAFF REPORT

TO: Chairman and Board Members
FROM: Mark Foree, General Manager
DATE: October 7, 2019
SUBJECT: **Presentation of TMWA Goals and Objectives Results for Fiscal Year 2019**

Discussion of Results

Please find attached an at-a-glance summary as well as the detailed measurement results for TMWA's corporate and departmental goals for the 2019 fiscal year. Where appropriate, TMWA uses the American Water Works Association (AWWA) Benchmarking Survey Results or the American Metropolitan Water Association (AMWA) for some of the goals to measure against. Below is a summary highlighting the results for specific organizational and departmental goals that required more detail.

ORGANIZATION OBJECTIVES	
Natural Resources	
1	All reservoirs (including Lake Tahoe) on the Truckee River system were at or very close to full capacity to start FY2019. TMWA's combined upstream reservoir storage was 37,600 acre-feet at that point. Opportunities for storing additional water under TROA were limited however almost all of FY2019. TMWA was able to carry-over 18,900 acre-feet of Credit Storage into January 2019. Including Donner and Independence lakes, TMWA's total upstream storage at the start of January 2019 was 35,500 acre-feet. But because the winter of 2018-2019 was so big, and projections for runoff so high, and upstream federal reservoirs still pretty much full, much of TMWA's Credit Water stored under TROA was either spilled or converted in April 2019. Opportunities to establish more Credit Water this spring under TROA were limited due to the availability of storage space in the federal reservoirs. Both Donner and Independence lakes did fill in June however, so TMWA ended FY 2019 with 37,240 acre-feet of combined upstream storage (just about the same position we ended FY2018 with). TMWA worked with numerous local, state and federal agencies to coordinate releases and exchanges of water in the spirit of TROA throughout FY 2019 to achieve multiple objectives for fish and wildlife, recreation and flood control.
2	TMWA is focusing its efforts on passive recharge while we work though added permitting and water quality requirements associated with active recharge. TMWA employs a total of 27 fully permitted recharge wells in the system and 581 acre-feet was recharged system-wide during FY 2019. TMWA is working with the Nevada Division of Water Resources for permit coverage on 27 additional wells. Through conjunctive use, groundwater pumping was reduced by over 2,000 AF in the Mt. Rose, Spanish Springs, Lemmon Valley and former STMGID areas.

ORGANIZATION OBJECTIVES	
Natural Resources (continued)	
3	TMWA staff continues to work extensively with stakeholders to implement return flow management agreement. TRI Center may start receiving water in late 2021.
4	Per Board direction, TMWA staff analyzed the fee amount, which decreased from $1, 830 per acre-foot (AF) to $1,600/AF; and broadened the fee purpose to support projects that enhance water resource sustainability and drought resiliency. Staff held an open house on November 8, 2018 and presented to the SAC and BANN at their November 2018 meetings. The Board adopted the new fee at its January 2019 meeting.
Efficiency	
1	We are in the top quartile (met the target) of at least 480 customer accounts per employee (AWWA benchmark) with a result of 529 customer accounts per employee.
2	We are close to the top quartile of MGD delivered per employee with a result of 0.31 compared to the AWWA benchmark of 0.33.
Safety	
1	Safety Incident Rate", had a result of 2.85 average incident rate, which was significantly lower than the benchmark measure of 5.0 for Water Supply & Irrigation Systems; we had five minor injuries with 0 days of work missed due to these minor injuries.
2	The preventable vehicle accidents had a result of 4.82 accidents per 1,000,000 miles driven, which is lower than the industry average of 5.45; We had 6 minor accidents with very little damage and all vehicle were back in service. 360˚ walk-around has proven to be a useful tool.
Financial	
3	We reaffirmed TMWA's Moody's rating of Aa2 stable and S&P rating of AA+ stable.
4	The goal to maintain a low debt ratio result was 42% putting us between the median and bottom quartile. We improved the result by 2% compared to last fiscal year.

DEPARTMENT GOALS	
Treatment	
1	There were several factors that impacted our ability to meet the FY18/19 goal including: power expenditures were higher than expected for pumping Fish Springs Ranch wells, substantial increase in primary water treatment chemical and reorganization of expense categories to normalize some capital expenditures as expense spending. The factors are now reflected in the FY19/20 treatment goal.
2	Treatment staff continued to challenge itself by meeting the effluent turbidity total of 0.00 NTU's 100% of the time, which is an "outstanding" rating.
Distribution	
5	Hydro generation was maintained at the target of 95% availability and we produced $2.6 million in revenue last fiscal year.
Natural Resources	
2	TMWA staff, a Board member, legal counsel and lobbyists met with legislators to amend bills that negatively impacted TMWA. Most notable of the bills were: AB 62 (extend time to complete construction of projects to divert water) passed with language acceptable to TMWA; AB136 (prevailing wage decreased from $250k to $100k); SB236 (allows for replacing a well within 300 feet and across parcels without changing a point of diversion); SB250 (dedication of water rights), amended and passed; SB358 (revision to definition of what qualifies as a renewable energy system), amendments were passed and TMWA's hydro facilities are no longer excluded from the bill. The interim session will include a committee on oversight of Marlette Lake, AB30 (3M bill), fire management, and how to implement SB250.
5	TMWA staff continues to collaborate with UNR's Nevada Water Innovation Institute projects. Most notably, analyzing the feasibility of advanced purified water for groundwater augmentation and/or indirect potable reuse.
Human Resources	
3	Over the next 5-years, TMWA will see approximately 58 employees retire, hence the result of 22.6%, which is below the median of 21.7%. Staff is working diligently on establishing an efficient succession plan to mitigate any gaps in experience and institutional knowledge with future retirements.
Finance	
2	We minimally overspent our O&M budget by $0.2m (0.3%). We did not experience any surprises in FY 2019 which resulted in actual spend essentially in line with budget. Expenses have gone up since the previous year due to inflation, increases in power costs due to the start up of the Fish Springs booster pumps and headcount increases partly due to training to cover upcoming retirements.
4	Staff continues to work toward the AMWA benchmark of $552 for TMWA's debt per capita. Despite our result of $900, it is an improvement of 4% from last fiscal year.

DEPARTMENT GOALS	
Engineering & New Business	
2	Continue to reflect major capital projects completed generally on time and approximately $4.85 million below budget
3	For new business turnaround time goals, TMWA's results improved from a year ago, on average 97% versus the 75% target for meeting the 30-day turnaround goal and were on average 100% versus the 100% target for meeting the 60-day turnaround goal.
4	TMWA staff successfully completed the 2015-2035 Water Facility Plan, which was presented to the Board at its June 2019 meeting which provided recommended facilities and improvements required to meet regulatory requirements and provide for future demand.
5	Staff provided extensive public outreach and communication regarding the proposed developer fee revisions for TMWA rate schedules Business Serves Fees and Water System Facility Charges. The amendments were adopted by the Board in August 2019 and will go into effect October 1, 2019.
6	Construction began in October of 2018 with a goal to be in service by Spring 2020. Due to a harsh 18-19 winter and construction delays, the goal has been revised to October 2020

TRUCKEE MEADOWS WATER AUTHORITY

Quality. Delivered.

Truckee Meadows Water Authority
FY 2019
Goals & Objectives

TMWA BOARD OF DIRECTORS
MARK FOREE, GENERAL MANAGER

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Contents

GOALS & OBJECTIVES: AT-A-GLANCE

ORGANIZATION

LEGEND:

Completed/On Target:

In progress:

Not met:

CUSTOMER SATISFACTION

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Residential Customers Totally or Mostly Satisfied.	71%-81% = Good 82%-86% = Excellent 86% + = Outstanding	% of residential customer's satisfaction	At least 86% residential customer satisfaction	91%
2	Commercial Customers Totally or Mostly Satisfied.	77%-87% = Good 88%-90% = Excellent 90% + = Outstanding	% of commercial customer satisfaction	At least 90% commercial customer satisfaction	86%
3	Meet the Faneuil contract requirement of 80% of calls answered within 35 seconds.		% of calls answered within 35 seconds	80%	100% of calls answered within 19 seconds

NATURAL RESOURCES

	OBJECTIVES	MEASURE	TARGET	RESULTS
1	Maximize benefit of TROA implementation.	Maximize upstream storage under TROA within hydrological and operational constraints. Continue to cooperate with TROA stakeholders to develop opportunities to improve reservoir operations and efficient use of water resources.	100%	100%
2	Manage aquifer storage and recovery (ASR) and passive recharge capabilities and operations.	Analyze effectiveness of ASR and passive recharge on a well-by-well basis within each basin. Complete semi-annual report describing ASR and passive recharge goals and results	100%	75%
3	Work with stakeholders to implement return flow management agreement.	Update Board on progress of implementation.	100%	90%
4	**NEW:** Change purpose of meter retrofit fee to allow funds to be used for water resource sustainability and drought resiliency projects.	Amend Rule 7 to change fee purpose	100%	100%

EFFICIENCY

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Track customer accounts per employee and compare to national benchmark.	Top Quartile = 480 Median = 374 Bottom Quartile = 269	# of accounts per employee	Top quartile	529
2	Track average MGD delivered per employee and compare to national benchmark.	Top Quartile = 0.33 Median = 0.20 Bottom Quartile = 0.16	Average MGD delivered per employee	Top quartile	0.31

SAFETY

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Maintain a safety incident rate below the Industry Standard Bureau of Labor Statistics, 2016.	5.0 Average Incident Rate for Water Supply & Irrigation Systems – Local Government	Incident rate	Less than 5.0	2.85
2	Track Collisions Per Million Miles (CPMM) and compare against Network of Employers for Traffic Safety Fleet Safety Benchmark Report (Reporting for North America Only, All Vehicles), 2017.	5.45 per 1,000,000 miles driven.	# of collisions per 1,000,000 miles driven	Less than 5.45	4.82

FINANCIAL

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Meet all bond covenants.		# of bond covenants met	100%	100%
2	Update the 5-year funding plan.		Update completed	100%	100%
3	Preserve or improve TMWA's excellent credit ratings by the two major credit rating bureaus S&P (AA+ stable) and Moody's (Aa2 stable)		Maintain or improve credit ratings	AA+ /Aa2 - stable or better	AA+ and Aa2
4	Maintain a low debt ratio.	Top Quartile = 27% Median = 39% Bottom = 58%	Debt ratio	Median	42%
5	Sustain a minimum of 485 days of cash reserve.	Top Quartile = 485 Median = 292 Bottom = 191	# of days of cash reserve	Top quartile	936
6	Maintain a debt-service coverage ratio of 1.5.	Top Quartile = 3.01 Median = 1.84 Bottom Quartile = 1.23	Debt-service coverage ratio	1.5 or better	2.9
7	Maintain high level of utility's financial effectiveness	Top Quartile: 3.4% Median: 2.6% Bottom Quartile: 1.6%	% return on assets	Median	2.6%

DEPARTMENT

TREATMENT

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD		MEASURE	TARGET	RESULTS
1	Meet the treatment costs set according to anticipated production.	If production is at or near: • 24,000 MG • 25,000 MG • 26,000 MG	TMWA cost: • $518.76/MG • $498.01/MG • $478.85/MG	Achieve $/MG in the respective production category	24kMG=$518.76/MG 25kMG=$498.01/MG 26kMG=$478.85/MG	27.43kMG = $496.99
2	Meet the benchmark of 0 (Zero) MCL violations.	0 (Zero) MCL violations		# of MCL violations	0	0
3	Maintain filter effluent turbidity 95% of the time.	At less than: • 0.30 NTU = EPA Standard • 0.20 NTU = Good; • 0.15 NTU = Excellent; • 0.10 NTU is Outstanding		# of NTU's	≤ 0.10 NTU	0.00 NTU Outstanding

DISTRIBUTION

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.04 Median = 0.62 Bottom Quartile = 1.64	# of unplanned outages / 1,000 customers	Median or better	0.03
2	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.01 Median = 0.10 Bottom Quartile = 0.57	# of unplanned outages / 1,000 customers	Median or better	0.06
3	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.04 Median = 0.41 Bottom Quartile = 1.18	# of planned outages / 1,000 customers	Median or better	0.02
4	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.00 Median = 0.09 Bottom Quartile = 0.59	# of planned outages / 1,000 customers	Median or better	0.42
5	Maintain 95% Hydro Plant Generation availability when river flow is available for generation (excluding planned maintenance and rehab, weather limitations and catastrophic failures).		% hydro generation availability	95%	95%
6	**NEW:** Track the percent rate of fire hydrants out-of-service.	75th Percentile: 0.0% Median: 1.2% 25th Percentile: 2.6%	Median or better	Median	0%

CUSTOMER SERVICE

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Customer Call Center will have an average call handle time of 4 minutes, 30 seconds or less per call.		Average handle time per call	4 min, 30 seconds or less	4 min, 26 seconds.
2	Achieve a monthly average of 4 non-weather estimates on all meter reads.		Monthly average of non-weather estimates	4/month or less	2.5 per month
3	The fiscal year average for disconnect for non-payment service orders to active accounts will be 0.30% or less.		% average of disconnects for non-payment	0.30% or less	0.02%
4	The write off to revenue will be 0.25% or less at fiscal year-end.		% of write off to revenue	0.25% or less	0.12%
5	Hold a minimum of 30 public workshops, tours and/or presentations with a primary focus on responsible water use and education, including Water Leadership workshops and open houses.		# of public workshops and/or tours	30 or more	79
6	Achieve 100% backflow testing compliance for all new construction and TMWA-owned devices, as well as 100% continued notification for backflow testing compliance for all existing customers.		% of backflow testing for new construction, TMWA-owned devices & existing customers	100%	100%
7	Perform 175 backflow retrofits.		# of backflow retrofits	175 or more	250
8	Maintain a high level of billing accuracy.	Top Quartile: 2.5 Median: 14.4 Bottom Quartile: 46.6	Billing accuracy rate	Top quartile	2.29%
9	**NEW:** Maintain a low percent of delinquency rate of accounts in FY19	Top Quartile: 1.5% Median: 5.0% Bottom Quartile: 13.0%	% of accounts delinquent	Median	1.81%
10	**NEW:** Maintain a high level of stakeholder outreach activities	Top Quartile: 91.7% Median: 66.7% Bottom Quartile: 41.7%	Stakeholder outreach engagement	Top quartile	91.7%

BUSINESS INFORMATION SYSTEMS

	GOALS	MEASURE	TARGET	RESULTS
1	Complete the mapping of New Business 'as-built' drawings within 7 days or less.	# of days mapping of 'as-built' drawings of 'redline' drawing submittal.	7 days or less	6 days
2	Close helpdesk tickets within 48 hours or less.	Average # of hours between the creation and closing of Helpdesk tickets.	48 hours or less	34 hours
3	Complete development of a Capital Project tracking workflow.	% implementation of the workflow necessary to track various departments' tasks as required for Capital Projects.	100%	100%
4	Complete development of TMWA BIS Strategic Plan to be accepted by Directors/Managers.	% complete	100%	100%

NATURAL RESOURCES

	GOALS	MEASURE	TARGET	RESULTS
1	Increase community awareness and understanding of TROA and its benefit to our area's municipal water supply.	Continue giving presentations to customer/industry groups regarding the benefits of TROA to the area's municipal water supply. Participate in TMWA's Smart About Water Day.	At least 10 presentations	10
2	Review, monitor, and advise the Board regarding issues and activities of the 2019 legislative session that may affect TMWA. Continue monitoring and stay updated on statewide water law issues.	As necessary, advise the Board regarding issues or activities that may affect TMWA.	100%	100%
3	Continue active role in maintaining sufficient water rights inventory, analyze purchase opportunities.	Maintain sufficient water rights inventory.	Monthly Board report	100%
4	Turn around new business application water rights work within 5 business days.	# of days turnaround new business application	5 days or less	3-day average
5	Remain actively involved with UNR's Nevada Water Innovation Institute projects.	Report activities to the Board	100%	100%
6	Respond to customer water usage audit requests within 2 business days and provide monthly conservation report to the Board.	# of days between receiving request and completing a water audit	2 days or less	Average of 1.07 days

HUMAN RESOURCES

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	**NEW:** Track continuous training for full-time (FTEs) employees.	Top Quartile: 24.6 Median: 17.9 Bottom Quartile: 13.6	# of continuous training hours per employee	Median or better	28.3 hours
2	Track the number of annual employee FTEs departures per year.	Top Quartile: 2.1% Median: 7.1% Bottom Quartile: 11.3%	# of FTEs departed per year	Median or better	5.3%
3	Track the number of FTEs eligible for retirement	Top Quartile: 15.6% Median: 21.7% Bottom Quartile: 35.0%	#of FTEs eligible for retirement	Median or better	22.5%

FINANCE

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Meet or underspend Capital Commitments as approved by the Board		$ spent	Met or underspent	$6.8m (14%) Underspent
2	Meet or underspend O&M Budget Commitments		$ spent	Met or underspent	$0.2 (0.3%) Overspent
3	Maintain a lean operating ratio	Top Quartile: 53% Median: 62% Bottom Quartile: 78%	% operating ratio	Median	56%
4	Reduce TMWA's debt per capita based on the American Metropolitan Water Association (AMWA) 2016 Survey.	AMWA Benchmark: $552 median	TMWA's debt per capita	Work toward median	$900
5	Maintain ratio of capital cost to total budgeted costs based on the AMWA 2016 Survey.	AMWA Benchmark: 25% - 50%	% of capital cost to total budgeted costs	25%	26%

ENGINEERING & NEW BUSINESS

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Continue cooperative coordination with Agencies and complete projects on schedule. Survey agency satisfaction with utility coordination effort.	1 = Unacceptable 2 = Needs Improvement 3 = Good 4 = Commendable 5 = Outstanding	Average response rate	4 or higher	4.30
2	Deliver required in-service dates for major capital projects on/under budget.	• Mt Rose WTP • S. Virginia Main (Midtown) • Verdi Main • Fleish Overflow & Rehab	$22,000,000	Met or underspent	$17.15M

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
3	Continue to measure and report new business turnaround times. **Project Category** Commercial with Main Commercial Service Subdivision	Number of Projects and turnaround times: 75% ≤ 30 days 100% ≤ 60 days	% turnaround in ≤ 30 days	75%	98% 99% 95%
			% turnaround in ≤ 60 days	100%	100% 100% 100%
4	**NEW:** Complete Water Facility Plan in FY19.		% complete	100%	100%
5	**NEW:** Update and revise Developer Fees in FY19.		% complete	100%	100%
6	Construct Mt. Rose Water Treatment Plant (WTP) with goal to be fully-operational by spring of 2020.	Meet in-service date.		100%	90%

GOALS & OBJECTIVES: DETAIL

ORGANIZATION

CUSTOMER SATISFACTION

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Residential Customers Totally or Mostly Satisfied.	71%-81% = Good 82%-86% = Excellent 86% + = Outstanding	% of residential customer's satisfaction	At least 86% residential customer satisfaction	91%
2	Commercial Customers Totally or Mostly Satisfied.	77%-87% = Good 88%-90% = Excellent 90% + = Outstanding	% of commercial customer satisfaction	At least 90% commercial customer satisfaction	86%
3	Meet the Faneuil contract requirement of 80% of calls answered within 35 seconds.		% of calls answered within 35 seconds	80%	100% of calls answered within 19 seconds

NATURAL RESOURCES

	OBJECTIVES	MEASURE	TARGET	RESULTS
1	Maximize benefit of TROA implementation.	Maximize upstream storage under TROA within hydrological and operational constraints. Continue to cooperate with TROA stakeholders to develop opportunities to improve reservoir operations and efficient use of water resources.	100%	100%
2	Manage aquifer storage and recovery (ASR) and passive recharge capabilities and operations.	Analyze effectiveness of ASR and passive recharge on a well-by-well basis within each basin. Complete semi-annual report describing ASR and passive recharge goals and results	100%	75%
3	Work with stakeholders to implement return flow management agreement.	Update Board on progress of implementation.	100%	90%
4	**NEW:** Change purpose of meter retrofit fee to allow funds to be used for water resource sustainability and drought resiliency projects.	Amend Rule 7 to change fee purpose	100%	100%

EFFICIENCY

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Track customer accounts per employee and compare to national benchmark.	Top Quartile = 480 Median = 374 Bottom Quartile = 269	# of accounts per employee	Top quartile	529
2	Track average MGD delivered per employee and compare to national benchmark.	Top Quartile = 0.33 Median = 0.20 Bottom Quartile = 0.16	Average MGD delivered per employee	Top quartile	0.31

Calculations:

Goal 1: $\frac{\text{129,359 (\# of Customer Accounts)}}{\text{244.77}}$

Goal 2: $\frac{\text{75.15 Average MGD}}{\text{244.77}}$

SAFETY

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Maintain a safety incident rate below the Industry Standard Bureau of Labor Statistics, 2016.	5.0 Average Incident Rate for Water Supply & Irrigation Systems – Local Government	Incident rate	Less than 5.0	2.85
2	Track Collisions Per Million Miles (CPMM) and compare against Network of Employers for Traffic Safety Fleet Safety Benchmark Report (Reporting for North America Only, All Vehicles), 2017.	5.45 per 1,000,000 miles driven.	# of collisions per 1,000,000 miles driven	Less than 5.45	4.82

Calculations:

Goal 1: $\frac{\text{7 (\# of accidents) x 200,000 (manhours)}}{\text{489,983.8 (Total manhours)}}$

Goal 2: $\frac{\text{7 (\# of collisions) x 1,000,000 (miles)}}{\text{1,450,870.2 (Total mileage)}}$

FINANCIAL

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Meet all bond covenants.		# of bond covenants met	100%	100%
2	Update the 5-year funding plan.		Update completed	100%	100%
3	Preserve or improve TMWA's excellent credit ratings by the two major credit rating bureaus S&P (AA+ stable) and Moody's (Aa2 stable)		Maintain or improve credit ratings	AA+ /Aa2 - stable or better	AA+ and Aa2
4	Maintain a low debt ratio.	Top Quartile = 27% Median = 39% Bottom = 58%	Debt ratio	Median	42%
5	Sustain a minimum of 485 days of cash reserve.	Top Quartile = 485 Median = 292 Bottom = 191	# of days of cash reserve	Top quartile	936
6	Maintain a debt-service coverage ratio of 1.5.	Top Quartile = 3.01 Median = 1.84 Bottom Quartile = 1.23	Debt-service coverage ratio	1.5 or better	2.9
7	Maintain high level of utility's financial effectiveness	Top Quartile: 3.4% Median: 2.6% Bottom Quartile: 1.6%	% return on assets	Median	2.6%

Calculations:

Goal 4: $490,313,203 (Total liabilities) / $1,177,948,335 (Total assets)

Goal 5: $152,883,536 (Undesignated cash reserves) / $59,633,301 (Total annual operations & maintenance costs) / 365 days

Goal 6: $107,089,518 (Total operating revenue) – $59,633,301 (Total O&M costs) / $17,890,663 (Total debt service)

Goal 7: $31,099,280 (Net income) / $1,177,948,335 (Total assets)

DEPARTMENT

TREATMENT

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD		MEASURE	TARGET	RESULTS
1	Meet the treatment costs set according to anticipated production.	If production is at or near: • 24,000 MG • 25,000 MG • 26,000 MG	TMWA cost: • $518.76/MG • $498.01/MG • $478.85/MG	Achieve $/MG in the respective production category	24kMG=$518.76/MG 25kMG=$498.01/MG 26kMG=$478.85/MG	27.43kMG = $496.99
2	Meet the benchmark of 0 (Zero) MCL violations.	0 (Zero) MCL violations		# of MCL violations	0	0
3	Maintain filter effluent turbidity 95% of the time.	At less than: • 0.30 NTU = EPA Standard • 0.20 NTU = Good; • 0.15 NTU = Excellent; • 0.10 NTU is Outstanding		# of NTU's	≤ 0.10 NTU	≤ 0.10 NTU Outstanding

Calculation:

Goal 1: 27,430 of MG produced at a cost of $496.99/MG

DISTRIBUTION

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.04 Median = 0.62 Bottom Quartile = 1.64	# of unplanned outages / 1,000 customers	Median or better	0.03
2	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.01 Median = 0.10 Bottom Quartile = 0.57	# of unplanned outages / 1,000 customers	Median or better	0.06
3	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.04 Median = 0.41 Bottom Quartile = 1.18	# of planned outages / 1,000 customers	Median or better	0.02
4	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.00 Median = 0.09 Bottom Quartile = 0.59	# of planned outages / 1,000 customers	Median or better	0.42
5	Maintain 95% Hydro Plant Generation availability when river flow is available for generation (excluding planned maintenance and rehab, weather limitations and catastrophic failures).		% hydro generation availability	95%	95%
6	**NEW:** Track the percent rate of fire hydrants out-of-service.	75th Percentile: 0.0% Median: 1.2% 25th Percentile: 2.6%	Median or better	Median	0%

Calculations:

Goal 1: (1,000) x 3.88 (Total outages) / 129,359 (Total customers)

Goal 2: (1,000) x 7.76 (Total outages) / 129,359 (Total customers)

Goal 3: (1,000) x 2.59 (Total outages) / 129,359 (Total customers)

Goal 4: (1,000) x 54 (Total outages) / 129,359 (Total customers)

Goal 6: $\frac{0 \text{ (\# of hydrants out of serviceFY19)}}{7{,}896 \text{ (Total \# of hydrants)}}$

CUSTOMER SERVICE

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Customer Call Center will have an average call handle time of 4 minutes, 30 seconds or less per call.		Average handle time per call	4 min, 30 seconds or less	4 min, 26 seconds.
2	Achieve a monthly average of 4 non-weather estimates on all meter reads.		Monthly average of non-weather estimates	4/month or less	2.5 per month
3	The fiscal year average for disconnect for non-payment service orders to active accounts will be 0.30% or less.		% average of disconnects for non-payment	0.30% or less	0.02%
4	The write off to revenue will be 0.25% or less at fiscal year-end.		% of write off to revenue	0.25% or less	0.12%
5	Hold a minimum of 30 public workshops, tours and/or presentations with a primary focus on responsible water use and education, including Water Leadership workshops and open houses.		# of public workshops and/or tours	30 or more	79
6	Achieve 100% backflow testing compliance for all new construction and TMWA-owned devices, as well as 100% continued notification for backflow testing compliance for all existing customers.		% of backflow testing for new construction, TMWA-owned devices & existing customers	100%	100%
7	Perform 175 backflow retrofits.		# of backflow retrofits	175 or more	250
8	Maintain a high level of billing accuracy.	Top Quartile: 2.5 Median: 14.4 Bottom Quartile: 46.6	Billing accuracy rate	Top quartile	2.29%
9	**NEW:** Maintain a low percent of delinquency rate of accounts in FY19	Top Quartile: 1.5% Median: 5.0% Bottom Quartile: 13.0%	% of accounts delinquent	Median	1.81%
10	**NEW:** Maintain a high level of stakeholder outreach activities	Top Quartile: 91.7% Median: 66.7% Bottom Quartile: 41.7%	Stakeholder outreach engagement	Top quartile	91.7%

Calculation:

Goal 5: 34 Tours, 33 Presentations, and 12 Workshops

Goal 8: $\frac{382 \text{ (error-driven billing adjustments)} \times 10{,}000}{1{,}668{,}299 \text{ of bills generated}}$

Goal 9: % of total accounts delinquent in FY19

BUSINESS INFORMATION SYSTEMS

	GOALS	MEASURE	TARGET	RESULTS
1	Complete the mapping of New Business 'as-built' drawings within 7 days or less.	# of days mapping of 'as-built' drawings of 'redline' drawing submittal.	7 days or less	6 days
2	Close helpdesk tickets within 48 hours or less.	Average # of hours between the creation and closing of Helpdesk tickets.	48 hours or less	34 hours
3	Complete development of a Capital Project tracking workflow.	% implementation of the workflow necessary to track various departments' tasks as required for Capital Projects.	100%	100%
4	Complete development of TMWA BIS Strategic Plan to be accepted by Directors/Managers.	% complete	100%	100%

NATURAL RESOURCES

	GOALS	MEASURE	TARGET	RESULTS
1	Increase community awareness and understanding of TROA and its benefit to our area's municipal water supply.	Continue giving presentations to customer/industry groups regarding the benefits of TROA to the area's municipal water supply. Participate in TMWA's Smart About Water Day.	At least 10 presentations	10
2	Review, monitor, and advise the Board regarding issues and activities of the 2019 legislative session that may affect TMWA. Continue monitoring and stay updated on statewide water law issues.	As necessary, advise the Board regarding issues or activities that may affect TMWA.	100%	100%
3	Continue active role in maintaining sufficient water rights inventory, analyze purchase opportunities.	Maintain sufficient water rights inventory.	Monthly Board report	100%
4	Turn around new business application water rights work within 5 business days.	# of days turnaround new business application	5 days or less	3-day average
5	Remain actively involved with UNR's Nevada Water Innovation Institute projects.	Report activities to the Board	100%	100%
6	Respond to customer water usage audit requests within 2 business days and provide monthly conservation report to the Board.	# of days between receiving request and completing a water audit	2 days or less	Average of 1.07 days

HUMAN RESOURCES

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	**NEW:** Track continuous training for full-time (FTEs) employees.	Top Quartile: 24.6 Median: 17.9 Bottom Quartile: 13.6	# of continuous training hours per employee	Median or better	28.3 hours
2	Track the number of annual employee FTEs departures per year.	Top Quartile: 2.1% Median: 7.1% Bottom Quartile: 11.3%	# of FTEs departed per year	Median or better	5.3%
3	Track the number of FTEs eligible for retirement	Top Quartile: 15.6% Median: 21.7% Bottom Quartile: 35.0%	#of FTEs eligible for retirement	Median or better	22.5%

Calculations:

Goal 1: $\frac{\text{6,925 (Total training hours by all employees)}}{\text{242.77 (Total \# of FTEs)}}$

Goal 2: $\frac{\text{13 (\# of FTEs departed)}}{\text{242.77 (Total \# of FTEs)}}$

Goal 3: $\frac{\text{58 (\# of FTEs eligible for retirement in the next 5 years)}}{\text{244.77 (Total \# of FTEs)}}$

FINANCE

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Meet or underspend Capital Commitments as approved by the Board		$ spent	Met or underspent	$6.8m (14%) Underspent
2	Meet or underspend O&M Budget Commitments		$ spent	Met or underspent	$0.2 (0.3%) Overspent
3	Maintain a lean operating ratio	Top Quartile: 53% Median: 62% Bottom Quartile: 78%	% operating ratio	Median	56%
4	Reduce TMWA's debt per capita based on the American Metropolitan Water Association (AMWA) 2016 Survey.	AMWA Benchmark: $552 median	TMWA's debt per capita	Work toward median	$900
5	Maintain ratio of capital cost to total budgeted costs based on the AMWA 2016 Survey.	AMWA Benchmark: 25% - 50%	% of capital cost to total budgeted costs	25%	26%

Calculation:

Goal 3: $\frac{\text{\$59,633,301 (Total O\&M costs)}}{\text{\$107,089,518 (Total operating revenue)}}$

Goal 4: $\frac{\text{380,673,396 (Total debt)}}{\text{423,063 (Population served)}}$

Goal 5: $\frac{\text{\$27,095,859 (Capital spend[customer rates])}}{\text{\$103,603,463 (Cost of service)}}$

ENGINEERING & NEW BUSINESS

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET	RESULTS
1	Continue cooperative coordination with Agencies and complete projects on schedule. Survey agency satisfaction with utility coordination effort.	1 = Unacceptable 2 = Needs Improvement 3 = Good 4 = Commendable 5 = Outstanding	Average response rate	4 or higher	4.30
2	Deliver required in-service dates for major capital projects on/under budget.	• Mt Rose WTP • S. Virginia Main (Midtown) • Verdi Main • Fleish Overflow & Rehab	$22,000,000	Met or underspent	$17.15M
3	Continue to measure and report new business turnaround times. **Project Category** Commercial with Main Commercial Service Subdivision	Number of Projects and turnaround times: 75% ≤ 30 days 100% ≤ 60 days	% turnaround in ≤ 30 days % turnaround in ≤ 60 days	75% 100%	98% 99% 95% 100% 100% 100%
4	**NEW:** Complete Water Facility Plan in FY19.		% complete	100%	100%
5	**NEW:** Update and revise Developer Fees in FY19.		% complete	100%	100%
6	Construct Mt. Rose Water Treatment Plant (WTP) with goal to be fully-operational by spring of 2020.	Meet in-service date.		100%	90%

Notes:

Goal 1: Survey the satisfaction of the appropriate coordinators at the City of Reno, City of Sparks, Regional Transportation Commission, NV Energy, NDOT and Washoe County with TMWA's Street & Highway Program.

*Seven (7) survey responses received for FY2019

Goal 2: Project Highlights

PROJECT	SCHEDULE	BUDGET	EXPENDED
Mt. Rose WTP	Original Goal Spring of 2020. Projected Summer of 2020.	$14,500,000	$9,113,176
S. Virginia Main (Midtown)	Schedule was dictated by RTC project. In service date was February 2019.	$3,000,000	$3,421,047
Verdi Main	Original Goal Spring of 2019. High River flows delayed the installation through the river casing. Projected Fall of 2019.	$2,500,000	$1,706,387
Fleish Overflow & Rehab	Original Goal was March of 2019. With the heavy winter and delays on the tailrace repair, in service date shifted to April of 2019.	$2,000,000	$2,905,402
TOTAL:		$22,000,000	$17,146,012

Goal 3: # of calendar days from application to first red-line review completed.

Project Category	# Projects	Avg. Days	<=30 days	<=60 days
Comm w/Main	49	18.7	98%	100%
Comm Services	111	11.7	99%	100%
Subdivision	59	22	95%	100%

TRUCKEE MEADOWS WATER AUTHORITY
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STAFF REPORT

TO: Chairman and Board Members
FROM: Mark Foree, General Manager
DATE: October 8, 2019
SUBJECT: **Discussion and action, and possible direction to staff on the proposed TMWA Goals and Objectives for Fiscal Year 2020**

RECOMMENDATION

Staff recommends that the Board adopt the Goals and Objectives for Fiscal Year 2020 as recommended and presented in this report. Where appropriate, TMWA uses the American Water Works Association (AWWA) Benchmarking Survey Results, 2018 Edition, and the Association of Metropolitan Water Agencies (AMWA) 2018 INSIGHT Survey Results, for some of the goals to measure against, or other published industry standards, if available.

DISCUSSION OF PROPOSED GOALS

For discussion, attached are TMWA's proposed organization and departmental goals and objectives for this fiscal year. Updated goals are noted in yellow, new goals are noted in red, and benchmarks are updated when a new edition of the AWWA Benchmarking Survey Results, as well as industry standards, are available.

TRUCKEE MEADOWS WATER AUTHORITY

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Truckee Meadows Water Authority

Proposed
FY 2020 Goals & Objectives

TMWA BOARD OF DIRECTORS
MARK FOREE, GENERAL MANAGER

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Contents

GOALS & OBJECTIVES: AT-A-GLANCE

ORGANIZATION

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
	CUSTOMER SATISFACTION			
1	Residential Customers Totally or Mostly Satisfied.	71%-81% = Good 82%-86% = Excellent 86% + = Outstanding	% of residential customer's satisfaction	At least 86% residential customer satisfaction
2	Commercial Customers Totally or Mostly Satisfied.	77%-87% = Good 88%-90% = Excellent 90% + = Outstanding	% of commercial customer satisfaction	At least 90% commercial customer satisfaction
3	Meet the Faneuil contract requirement of 80% of calls answered within 35 seconds.		% of calls answered within 35 seconds	80%
	EFFICIENCY			
1	Track customer accounts per employee and compare to national benchmark.	Top Quartile = 595 Median = 440 Bottom Quartile = 295	# of accounts per employee	Top quartile
2	Track average MGD delivered per employee and compare to national benchmark.	Top Quartile = 0.26 Median = 0.19 Bottom Quartile = 0.14	Average MGD delivered per employee	Top quartile
	SAFETY			
1	Maintain a safety incident rate below the Industry Standard Bureau of Labor Statistics, 2017.	5.0 Average Incident Rate for Water Supply & Irrigation Systems – Local Government	Incident rate	Less than 5.0
2	Track Collisions Per Million Miles (CPMM) and compare against Network of Employers for Traffic Safety Fleet Safety Benchmark Report (Reporting for North America Only, All Vehicles), 2018.	4.32 per 1,000,000 miles driven.	# of collisions per 1,000,000 miles driven	Less than 4.32
	FINANCIAL			
1	Meet all bond covenants.		# of bond covenants met	100%
2	Update the 5-year funding plan.		Update completed	100%
3	Preserve or improve TMWA's excellent credit ratings by the three major credit rating bureaus: S&P (AA+ stable), Moody's (Aa2 stable) and Fitch (A+ stable).		Maintain or improve credit ratings	AA+ /Aa2/A+ - stable or better

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
	FINANCIAL (continued)			
4	Maintain a low debt ratio.	Top Quartile = 23% Median = 34% Bottom = 50%	Debt ratio	Median
5	Sustain a minimum of 431 days of cash reserve.	Top Quartile = 431 Median = 313 Bottom = 183	# of days of cash reserve	Top quartile
6	Maintain a debt-service coverage ratio of 1.5.	Top Quartile = 2.84 Median = 2.25 Bottom Quartile = 1.88	Debt-service coverage ratio	1.5 or better
7	Maintain high level of utility's financial effectiveness	Top Quartile: 3.5% Median: 2.5% Bottom Quartile: 1.4%	% return on assets	Median
	NATURAL RESOURCES			
1	Maximize benefit of TROA implementation.		Maximize upstream storage under TROA within hydrological and operational constraints. Continue to cooperate with TROA stakeholders to develop opportunities to improve reservoir operations and efficient use of water resources.	100%
2	Manage aquifer storage and recovery (ASR) and passive recharge capabilities and operations.		Analyze effectiveness of ASR and passive recharge on a well-by-well basis within each basin. Complete semi-annual report describing ASR and passive recharge goals and results	100%
3	Work with stakeholders to implement return flow management agreement.		Update Board on progress of implementation	100%

DEPARTMENT

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD		MEASURE	TARGET
	TREATMENT				
1	Meet the treatment costs set according to anticipated production.	If production is at or near: • 26,000 MG • 27,000 MG • 28,000 MG	TMWA cost: • $593.67/MG • $571.68/MG • $551.26/MG	Achieve $/MG in the respective production category	26kMG=$593.67/MG 27kMG=$571.68/MG 28kMG=$551.26/MG
2	Meet the benchmark of 0 (Zero) MCL violations.	0 (Zero) MCL violations		# of MCL violations	0
3	Maintain effluent turbidity 95% of the time.	At less than: • 0.30 NTU = EPA Standard • 0.20 NTU = Good; • 0.15 NTU = Excellent; • 0.10 NTU is Outstanding		# of NTU's	≤ 0.10 NTU
	DISTRIBUTION				
1	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.21 Median = 0.76 Bottom Quartile = 2.09		# of unplanned outages/1,000 customers	Median or better
2	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.08 Median = 0.25 Bottom Quartile = 0.69		# of unplanned outages/1,000 customers	Median or better
3	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.30 Median = 0.91 Bottom Quartile = 1.39		# of planned outages/1,000 customers	Median or better
4	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.02 Median = 0209 Bottom Quartile = 0.45		# of planned outages/1,000 customers	Median or better
5	Maintain 95% Hydro Plant Generation availability when river flow is available for generation (excluding planned maintenance and rehab, weather limitations and catastrophic failures).			% hydro generation availability	95%

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
	OPERATIONS			
1	Achieve 100% backflow testing compliance for all new construction and TMWA-owned devices, as well as 100% continued notification for backflow testing compliance for all existing customers.		% of backflow testing for new construction, TMWA-owned devices & existing customers	100%
2	Perform 175 backflow retrofits.		# of backflow retrofits	175 or more
3	**NEW:** Convert 86 of 172 (50%) field sites and stations with SCADA control in an unsupportable Legacy H.M.I. (Human Machine Interface) platform to operate within a supported and modern OMI (Operations Machine Interface) platform.		# of sites & stations converted to OMI	86
4	**NEW:** Maintain a 96% level uptime of the OMI (Operations Machine Interface) platform and underlying infrastructure within TMWA's direct purview for the acceptable periods of outage within a 24 hour, 7 day a week, 365 day operational period.		Duration of cumulative outage events should not exceed acceptable outage measurements	Daily: 57 min Weekly: 7 hrs Monthly: 1 day Yearly: 14 days
	CUSTOMER SERVICE			
1	Customer Call Center will have an average call handle time of 4 minutes, 30 seconds or less per call.		Average handle time per call	4 min, 30 seconds or less
2	Achieve a monthly average of 4 non-weather estimates on all meter reads.		Monthly average of non-weather estimates	4/month or less
3	The fiscal year average for disconnect for non-payment service orders to active accounts will be 0.30% or less.		% average of disconnects for non-payment	0.30% or less
4	The write off to revenue will be 0.25% or less at fiscal year-end.		% of write off to revenue	0.25% or less
5	Hold a minimum of 30 public workshops, tours and/or presentations with a primary focus on responsible water use and education, including Water Leadership workshops and open houses.		# of public workshops and/or tours	30 or more
6	Maintain a high level of billing accuracy.	Top Quartile = 1.4 Median = 10.8 Bottom Quartile = 33.8	Billing accuracy rate	Median
7	Track percentage of total accounts delinquent in FY 2019	75th Percentile: 2.7% Median: 6.0% 25th Percentile: 14.0%	% of delinquent accounts	Median
8	Maintain high level of stakeholder outreach activities.	Top Quartile: 92% Median: 75% Bottom Quartile: 50%	Stakeholder outreach engagement	Top quartile

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
BUSINESS INFORMATION SYSTEMS				
1	Complete the mapping of New Business 'as-built' drawings within 7 days or less.		# of days mapping of 'as-built' drawings of 'redline' drawing submittal.	7 days or less
2	Close helpdesk tickets within 48 hours or less.		Average # of hours between the creation and closing of Helpdesk tickets.	48 hours or less
3	**NEW**: Provide public access to TMWA New Business project information and status.		% implementation of the external website necessary to display New Business project statuses.	100%
NATURAL RESOURCES				
1	Increase community awareness and understanding of TROA and its benefit to our area's municipal water supply.		Continue giving presentations to customer/industry groups on TMWA's overall water resource management strategies, including the benefits of TROA, ASR, conservation, and A+ Reclaimed Water feasibility to the area's municipal water supply. Participate in TMWA's Smart About Water Day.	At least 5 presentations
2	Review, monitor, and advise the Board regarding issues and activities of the interim legislative session that may affect TMWA. Continue monitoring and stay updated on statewide water law issues.		As necessary, advise the Board regarding issues or activities that may affect TMWA.	100%
3	Continue an active role in maintaining sufficient water rights inventory, analyze purchase opportunities.		Maintain sufficient water rights inventory.	Monthly Board report
4	Turn around new business application water rights work within 5 business days.		# of days turnaround new business application	5 days or less
5	Remain actively involved with UNR's Nevada Water Innovation Institute projects		Report activities to the Board	100%
6	Respond to customer water usage audit requests within 2 business days and provide monthly conservation report to the Board		# of days between receiving request and completing a water audit	2 days or less
HUMAN RESOURCES				
1	Track continuous training for full-time equivalents (FTEs) employees.	Top Quartile: 27.1 Median: 17.1 Bottom Quartile: 10.4	# of continuous training hours per employee	Median or better
2	Track the number of annual employee FTEs departures per year.	Top Quartile: 4.5% Median: 7.5% Bottom Quartile: 10.6%	# of FTEs departed per year	Median or better
3	Track the number of FTEs eligible for retirement	Top Quartile: 14.3% Median: 20.5% Bottom Quartile: 34.1%	#of FTEs eligible for retirement	Median or better

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
	FINANCE			
1	Meet or underspend Capital Commitments as approved by the Board		$ spent	Met or underspent
2	Meet or underspend O&M Budget Commitments		$ spent	Met or underspent
3	Maintain a lean operating ratio	Top Quartile: 45% Median: 59% Bottom Quartile: 70%	% operating ratio	Median
4	Reduce TMWA's debt per capita based on the American Metropolitan Water Association (AMWA) 2016 Survey.	AMWA Benchmark: $531 median	TMWA's debt per capita	Work toward median
5	Maintain ratio of capital cost to total budgeted costs based on the AMWA 2016 Survey.	AMWA Benchmark: 25% - 50%	% of capital cost to total budgeted costs	25%
	ENGINEERING & NEW BUSINESS			
1	Continue cooperative coordination with Agencies and complete projects on schedule. Survey agency satisfaction with utility coordination effort.	1 = Unacceptable 2 = Needs Improvement 3 = Good 4 = Commendable 5 = Outstanding	Average response rate	4 or higher
2	Deliver required in-service dates for major capital projects on/under budget.	• Mt Rose WTP – Oct 2020 • Kings Row 1 BPS – June 2020 • Gear, Vine and Washington Main Replacements – March 2020 • Boomtown System Improvements – June 2020	$17,750,000	Met or underspent
3	Continue to measure and report new business turnaround times. **<u>Project Category</u>** Commercial with Main Commercial Service Subdivision	Number of Projects and turnaround times: 75% ≤ 30 days 100% ≤ 60 days	% turnaround in ≤ 30 days % turnaround in ≤ 60 days	75% 100%
4	Complete construction of Mt. Rose Water Treatment Plant (WTP) with goal to be fully-operational by fall of 2020.		Meet in-service date.	100%
5	**NEW:** Create an implementation plan for allowing digital plan submission and review/approval for New Business Projects.		% complete	100%

GOALS & OBJECTIVES: IN DETAIL

ORGANIZATION

CUSTOMER SATISFACTION

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Residential Customers Totally or Mostly Satisfied.	71%-81% = Good 82%-86% = Excellent 86% + = Outstanding	% of residential customer's satisfaction	At least 86% residential customer satisfaction
2	Commercial Customers Totally or Mostly Satisfied.	77%-87% = Good 88%-90% = Excellent 90% + = Outstanding	% of commercial customer satisfaction	At least 90% commercial customer satisfaction
3	Meet the Faneuil contract requirement of 80% of calls answered within 35 seconds.		% of calls answered within 35 seconds	80%

EFFICIENCY

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Track customer accounts per employee and compare to national benchmark.	Top Quartile = 595 Median = 440 Bottom Quartile = 295	# of accounts per employee	Top quartile
2	Track average MGD delivered per employee and compare to national benchmark.	Top Quartile = 0.26 Median = 0.19 Bottom Quartile = 0.14	Average MGD delivered per employee	Top quartile

Calculations:

Goal 1: $\frac{\text{\# of Customer Accounts}}{\text{\# of Employees}}$

Goal 2: $\frac{\text{Average MGD}}{\text{\# of Employees}}$

SAFETY

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Maintain a safety incident rate below the Industry Standard Bureau of Labor Statistics, 2017.	5.0 Average Incident Rate for Water Supply & Irrigation Systems – Local Government	Incident rate	Less than 5.0
2	Track Collisions Per Million Miles (CPMM) and compare against Network of Employers for Traffic Safety Fleet Safety Benchmark Report (Reporting for North America Only, All Vehicles), 2018.	4.32 per 1,000,000 miles driven.	# of collisions per 1,000,000 miles driven	Less than 4.32

Calculations:

Goal 1: $\frac{\text{\# of accidents x 200,000 manhours}}{\text{Total manhours}}$

Goal 2: $\frac{\text{\# of collisions x 1,000,000 miles}}{\text{Total mileage}}$

FINANCIAL

	OBJECTIVES	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Meet all bond covenants.		# of bond covenants met	100%
2	Update the 5-year funding plan.		Update completed	100%
3	Preserve or improve TMWA's excellent credit ratings by the three major credit rating bureaus: S&P (AA+ stable), Moody's (Aa2 stable) and Fitch (A+ stable).		Maintain or improve credit ratings	AA+ /Aa2/A+ - stable or better
4	Maintain a low debt ratio.	Top Quartile = 23% Median = 34% Bottom = 50%	Debt ratio	Median
5	Sustain a minimum of 431 days of cash reserve.	Top Quartile = 431 Median = 313 Bottom = 183	# of days of cash reserve	Top quartile
6	Maintain a debt-service coverage ratio of 1.5.	Top Quartile = 2.84 Median = 2.25 Bottom Quartile = 1.88	Debt-service coverage ratio	1.5 or better
7	Maintain high level of utility's financial effectiveness	Top Quartile: 3.5% Median: 2.5% Bottom Quartile: 1.4%	% return on assets	Median

Financial Objectives Calculations:

Goal 4: $\frac{\text{Total liabilities}}{\text{Total assets}}$

Goal 5: $\frac{\text{Undesignated cash reserves}}{\text{Total annual operations \& maintenance costs / 365 days}}$

Goal 6: $\frac{\text{Total operating revenue – Total O\&M costs}}{\text{Total debt service}}$

Goal 7: $\frac{\text{Net income}}{\text{Total assets}}$

NATURAL RESOURCES

	OBJECTIVES	MEASURE	TARGET
1	Maximize benefit of TROA implementation.	Maximize upstream storage under TROA within hydrological and operational constraints. Continue to cooperate with TROA stakeholders to develop opportunities to improve reservoir operations and efficient use of water resources.	100%
2	Manage aquifer storage and recovery (ASR) and passive recharge capabilities and operations.	Analyze effectiveness of ASR and passive recharge on a well-by-well basis within each basin. Complete semi-annual report describing ASR and passive recharge goals and results	100%
3	Work with stakeholders to implement return flow management agreement.	Update Board on progress of implementation	100%

DEPARTMENT

TREATMENT

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD		MEASURE	TARGET
1	Meet the treatment costs set according to anticipated production.	If production is at or near: • 26,000 MG • 27,000 MG • 28,000 MG	TMWA cost: • $593.67/MG • $571.68/MG • $551.26/MG	Achieve $/MG in the respective production category	26kMG=$593.67/MG 27kMG=$571.68/MG 28kMG=$551.26/MG
2	Meet the benchmark of 0 (Zero) MCL violations.	0 (Zero) MCL violations		# of MCL violations	0
3	Maintain effluent turbidity 95% of the time.	At less than: • 0.30 NTU = EPA Standard • 0.20 NTU = Good; • 0.15 NTU = Excellent; • 0.10 NTU is Outstanding		# of NTU's	≤ 0.10 NTU

Calculation:

Goal 1: # of MG produced at a cost of $/MG

DISTRIBUTION

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.21 Median = 0.76 Bottom Quartile = 2.09	# of unplanned outages/1,000 customers	Median or better
2	Track system reliability by calculating the number of unplanned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.08 Median = 0.25 Bottom Quartile = 0.69	# of unplanned outages/1,000 customers	Median or better
3	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **< 4 hours**	Top Quartile = 0.30 Median = 0.91 Bottom Quartile = 1.39	# of planned outages/1,000 customers	Median or better
4	Track system reliability by calculating the number of planned outages per 1,000 customers and compare to national benchmarks. **4 – 12 hours**	Top Quartile = 0.02 Median = 0209 Bottom Quartile = 0.45	# of planned outages/1,000 customers	Median or better
5	Maintain 95% Hydro Plant Generation availability when river flow is available for generation (excluding planned maintenance and rehab, weather limitations and catastrophic failures).		% hydro generation availability	95%

OPERATIONS

	GOALS	MEASURE	TARGET
1	Achieve 100% backflow testing compliance for all new construction and TMWA-owned devices, as well as 100% continued notification for backflow testing compliance for all existing customers.	% of backflow testing for new construction, TMWA-owned devices & existing customers	100%
2	Perform 175 backflow retrofits.	# of backflow retrofits	175 or more
3	**NEW:** Convert 86 of 172 (50%) field sites and stations with SCADA control in an unsupportable Legacy H.M.I. (Human Machine Interface) platform to operate within a supported and modern OMI (Operations Machine Interface) platform.	# of sites & stations converted to OMI	86
4	**NEW:** Maintain a 96% level uptime of the OMI (Operations Machine Interface) platform and underlying infrastructure within TMWA's direct purview for the acceptable periods of outage within a 24 hour, 7 day a week, 365 day operational period.	Duration of cumulative outage events should not exceed acceptable outage measurements	Daily: 57 min Weekly: 7 hrs Monthly: 1 day Yearly: 14 days

CUSTOMER SERVICE

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Customer Call Center will have an average call handle time of 4 minutes, 30 seconds or less per call.		Average handle time per call	4 min, 30 seconds or less
2	Achieve a monthly average of 4 non-weather estimates on all meter reads.		Monthly average of non-weather estimates	4/month or less
3	The fiscal year average for disconnect for non-payment service orders to active accounts will be 0.30% or less.		% average of disconnects for non-payment	0.30% or less
4	The write off to revenue will be 0.25% or less at fiscal year-end.		% of write off to revenue	0.25% or less
5	Hold a minimum of 30 public workshops, tours and/or presentations with a primary focus on responsible water use and education, including Water Leadership workshops and open houses.		# of public workshops and/or tours	30 or more
6	Maintain a high level of billing accuracy.	Top Quartile = 1.4 Median = 10.8 Bottom Quartile = 33.8	Billing accuracy rate	Median
7	Track percentage of total accounts delinquent in FY 2019	75th Percentile: 2.7% Median: 6.0% 25th Percentile: 14.0%	% of delinquent accounts	Median
8	Maintain high level of stakeholder outreach activities.	Top Quartile: 92% Median: 75% Bottom Quartile: 50%	Stakeholder outreach engagement	Top quartile

Calculation:

Goal 8: $\frac{\text{\# error-driven billing adjustments x 10,000}}{\text{\# of bills generated}}$

Goal 9: % of Total accounts delinquent in FY20

BUSINESS INFORMATION SYSTEMS

	GOALS	MEASURE	TARGET
1	Complete the mapping of New Business 'as-built' drawings within 7 days or less.	# of days mapping of 'as-built' drawings of 'redline' drawing submittal.	7 days or less
2	Close helpdesk tickets within 48 hours or less.	Average # of hours between the creation and closing of Helpdesk tickets.	48 hours or less
3	**NEW**: Provide public access to TMWA New Business project information and status.	% implementation of the external website necessary to display New Business project statuses.	100%

NATURAL RESOURCES

	GOALS	MEASURE	TARGET
1	Increase community awareness and understanding of TROA and its benefit to our area's municipal water supply.	Continue giving presentations to customer/industry groups on TMWA's overall water resource management strategies, including the benefits of TROA, ASR, conservation, and A+ Reclaimed Water feasibility to the area's municipal water supply. Participate in TMWA's Smart About Water Day.	At least 5 presentations
2	Review, monitor, and advise the Board regarding issues and activities of the interim legislative session that may affect TMWA. Continue monitoring and stay updated on statewide water law issues.	As necessary, advise the Board regarding issues or activities that may affect TMWA.	100%
3	Continue an active role in maintaining sufficient water rights inventory, analyze purchase opportunities.	Maintain sufficient water rights inventory.	Monthly Board report
4	Turn around new business application water rights work within 5 business days.	# of days turnaround new business application	5 days or less
5	Remain actively involved with UNR's Nevada Water Innovation Institute projects	Report activities to the Board	100%
6	Respond to customer water usage audit requests within 2 business days and provide monthly conservation report to the Board	# of days between receiving request and completing a water audit	2 days or less

HUMAN RESOURCES

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Track continuous training for full-time equivalents (FTEs) employees.	Top Quartile: 27.1 Median: 17.1 Bottom Quartile: 10.4	# of continuous training hours per employee	Median or better
2	Track the number of annual employee FTEs departures per year.	Top Quartile: 4.5% Median: 7.5% Bottom Quartile: 10.6%	# of FTEs departed per year	Median or better
3	Track the number of FTEs eligible for retirement	Top Quartile: 14.3% Median: 20.5% Bottom Quartile: 34.1%	#of FTEs eligible for retirement	Median or better

FINANCE

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Meet or underspend Capital Commitments as approved by the Board		$ spent	Met or underspent
2	Meet or underspend O&M Budget Commitments		$ spent	Met or underspent
3	Maintain a lean operating ratio	Top Quartile: 45% Median: 59% Bottom Quartile: 70%	% operating ratio	Median
4	Reduce TMWA's debt per capita based on the American Metropolitan Water Association (AMWA) 2016 Survey.	AMWA Benchmark: $531 median	TMWA's debt per capita	Work toward median
5	Maintain ratio of capital cost to total budgeted costs based on the AMWA 2016 Survey.	AMWA Benchmark: 25% - 50%	% of capital cost to total budgeted costs	25%

Calculation:

Goal 3: $\frac{\text{Total O\&M costs}}{\text{Total operating revenue}}$

Goal 4: $\frac{\text{Total debt}}{\text{Population served}}$

Goal 5: $\frac{\text{CIP budget}}{\text{Cost of service}}$

ENGINEERING & NEW BUSINESS

	GOALS	AWWA BENCHMARK/ INDUSTRY STANDARD	MEASURE	TARGET
1	Continue cooperative coordination with Agencies and complete projects on schedule. Survey agency satisfaction with utility coordination effort.	1 = Unacceptable 2 = Needs Improvement 3 = Good 4 = Commendable 5 = Outstanding	Average response rate	4 or higher
2	Deliver required in-service dates for major capital projects on/under budget.	• Mt Rose WTP – Oct 2020 • Kings Row 1 BPS – June 2020 • Gear, Vine and Washington Main Replacements – March 2020 • Boomtown System Improvements – June 2020	$17,750,000	Met or underspent
3	Continue to measure and report new business turnaround times. **<u>Project Category</u>** Commercial with Main Commercial Service Subdivision	Number of Projects and turnaround times: 75% ≤ 30 days 100% ≤ 60 days	% turnaround in ≤ 30 days	75%
			% turnaround in ≤ 60 days	100%
4	Complete construction of Mt. Rose Water Treatment Plant (WTP) with goal to be fully-operational by fall of 2020.		Meet in-service date.	100%
5	**NEW:** Create an implementation plan for allowing digital plan submission and review/approval for New Business Projects.		% complete	100%

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.

STAFF REPORT

TO: Board of Directors
FROM: Mark Foree, General Manager
DATE: October 7, 2019
SUBJECT: **General Manager's Report**

Attached please find the written reports from the Management team including the Operations Report ***(Attachment A)***, the Water Resource and the Annexation Activity Report ***(Attachment B)***, the Customer Services Report ***(Attachment C)***, and the Monthly Conservation Report ***(Attachment D).***

Included in your agenda packet are press clippings from September 12, 2019 through October 9, 2019.

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.

STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: Scott Estes, Director of Engineering
BY: Bill Hauck, Senior Hydrologist
DATE: October 7, 2019
SUBJECT: **October 2019 Operations Report**

Summary

- The water supply outlook for the region couldn't be better than it is right now
- Total upstream reservoir storage is at 79% of maximum capacity
- Lake Tahoe is down just 1.3 feet from its maximum elevation (and also 79% of capacity)
- A significant amount of carry-over storage on the Truckee system virtually assures the region of normal river flows for the next 2 years
- Hydroelectric revenue for September 2019 was approximately $340,777
- Customer demands continue to decline as winter is approaching quickly

(A) Water Supply

- **River Flows** - Truckee River flows at the CA/NV state line are above average for this time of year. Discharge was 480 cubic feet per second (CFS) this morning. The average flow for October 7th based on 110 years of record is 390 CFS.

- **Reservoir Storage** - With wintertime fast approaching, upstream reservoir storage on the Truckee River system is in excellent shape at 79% of capacity. The elevation of Tahoe is still quite high at 6227.82 feet (1.3' below legal maximum storage elevation). Storage values for each reservoir as of 10/4 are as follows:

Reservoir	Current Storage (Acre-Feet)	% of Capacity (Percent)
Tahoe	587,200	79%
Boca	15,346	38%
Donner	4,475	47%
Independence	14,587	83%
Prosser	13,938	47%
Stampede	211,389	94%

In addition to the 19,100 acre-feet of storage in Donner and Independence reservoirs, TMWA has over 17,200 acre-feet of water stored between Lake Tahoe, Boca and Stampede reservoirs under the terms of TROA. TMWA's total combined upstream reservoir storage is approximately 36,300 acre-feet as of 10/4.

- **Outlook** - Upstream reservoir storage couldn't be in better shape than it is right now. Lake Tahoe and all the other reservoirs on the Truckee River system were filled-to-capacity only a few months ago as a result of another big winter, leaving this region positioned extremely well from a water supply perspective. Normal Truckee River flows are virtually guaranteed over the next two years regardless of what happens this winter.

(B) Water Production

- **Demand** - Customer demand year-to-date (YTD) is approximately 2% higher than last year through this point in time. Demands are declining noticeably with the shorter days and cooler night time temperatures associated with fall. Last week demand averaged 93 million gallons per day (MGD). Overall, surface water is providing about 82% of our supply and groundwater the other 18%.

(C) Hydro Production

Generation - Average Truckee River flow at Farad (CA/NV state line) for the month of September averaged 543 cubic feet per second (CFS). All three of TMWA's power plants were on the line for the entire month and 100% available. Monthly statistics are as follows:

Hydro Plant	Days On-Line	Generation (Megawatt hours)	Revenue (Dollars)	Revenue (Dollars/Day)
Fleish	30	1,812	$ 132,634	$ 4,421
Verdi	30	1,674	$ 121,442	$ 4,048
Washoe	30	1,184	$ 86,701	$ 2,890
Totals	**90**	**4,670**	**$ 340,777**	**$ 11,359**

TRUCKEE MEADOWS WATER AUTHORITY
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STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: John Zimmerman, Manager, Water Resources
DATE: 8 October 2019
SUBJECT: **Report Water Resources and Annexation Activity**

RULE 7

Rule 7 water resource purchases and will-serve commitment sales against purchased water resources through this reporting period:

Beginning Balance		4,243.55 AF
Purchases of water rights	3.67 AF	
Refunds	0.00 AF	
Sales	− 10.02 AF	
Adjustments	− 0.00 AF	
Ending Balance		4,237.20 AF

Price per acre foot at report date: $7,700

FISH SPRINGS RANCH, LLC GROUNDWATER RESOURCES

Through the merger of Washoe County's water utility, TMWA assumed a Water Banking and Trust Agreement with Fish Springs Ranch, LLC, a subsidiary of Vidler. Under the Agreement, TMWA holds record title to the groundwater rights for the benefit of Fish Springs. Fish Springs may sell and assign its interest in these groundwater rights to third parties for dedication to TMWA for a will-serve commitment in Areas where TMWA can deliver groundwater from the Fish Springs groundwater basin. Currently, TMWA can deliver Fish Springs groundwater to Area 10 only (Stead-Silver Lake-Lemmon Valley). The following is a summary of Fish Springs' resources.

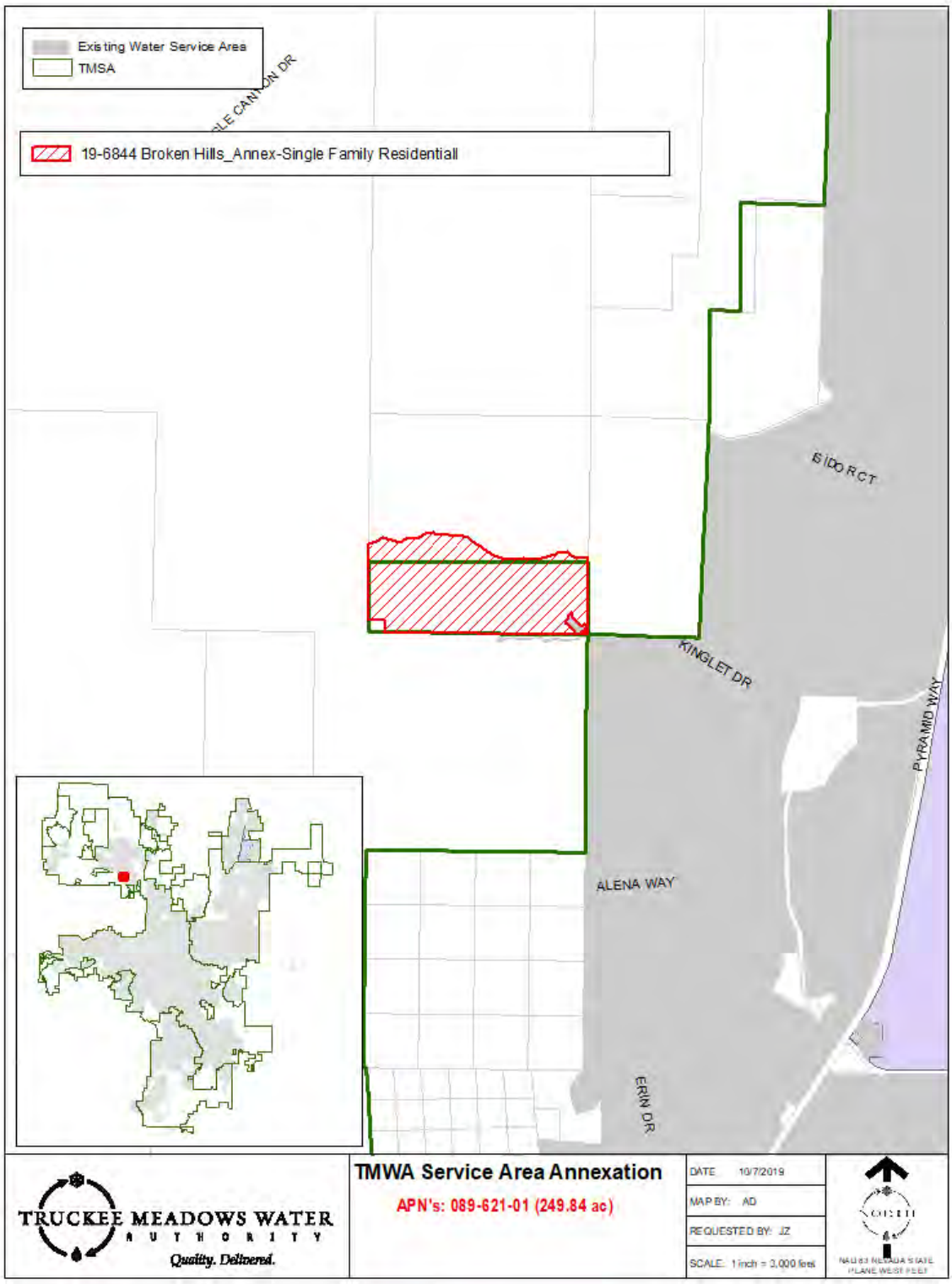
Beginning Balance		7,809.43 AF
Committed water rights	− 0.00 AF	
Ending Balance		7,809.43 AF

Price per acre foot at report date: $35,000[1]

[1] Price reflects avoided cost of Truckee River water right related fees and TMWA Supply & Treatment WSF charge.

WATER SERVICE AREA ANNEXATIONS

There has been one annexation since the date of the last Board meeting (249.84-acre single-family residential property in Spanish Springs). See attached map.


Existing Water Service Area
TMSA
19-6844 Broken Hills_Annex-Single Family Residentiall
SIDDRCT
KINGLET DR
PYRAMID WAY
ALENA WAY
ERIN DR
TRUCKEE MEADOWS WATER AUTHORITY
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TMWA Service Area Annexation
APN's: 089-621-01 (249.84 ac)
DATE 10/7/2019
MAP BY: AD
REQUESTED BY: JZ
SCALE: 1 inch = 3,000 feet
NAD 83 NEVADA STATE PLANE WEST FEET

TRUCKEE MEADOWS WATER AUTHORITY
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STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: Marci Westlake, Manager Customer Service
DATE: October 16, 2019
SUBJECT: **September Customer Service Report**

The following is a summary of Customer Service activity for September 2019.

Ombudsman

- Customer called concerned about sediment in the storm drain- we referred them to the proper agency, and he was happy with the outcome.
- Customer called concerned about a leak but, did not give a valid number.

Communications

Customer outreach in September included:

- Lauren Kunin and Tom Stille did the Valley Wood Walking Tour and 35 people attended.
- Cameron Shultz had a Hydro generation/facilities tour and 14 people attended.
- Pat Nielson and Brent Eisert had a Hydro generation/facilities tour and 10 people attended.
- Brent Eisert had a Hydro generation/facilities tour and 40 people attended.
- Chuck Swegles and Tommy had an Informational Table at River Cleanup Picnic for KTMB and 250 stopped by the table.
- John Enloe did a TRI Center Reclaimed Water Project presentation for the WateReuse Association Conference in San Diego and 300 people attended.
- Kara Steeland had a Water Resource Planning panel discussion and 40 people attended.
- Will Raymond had a Water Treatment/Water Quality tour and 2 people attended.
- Will Raymond had a Water Treatment/Water Quality tour and 11 people attended.
- Will Raymond had a Water Treatment/Water Quality tour and 4 people attended.
- James Weingart had a Water Treatment/Water Quality tour and 24 people attended.
- Will Raymond had a Nitrate Remediation/Treatment Project presentation and 40 people attended.
- Will Raymond had a Water Treatment/Water Quality tour and 10 people attended.

Conservation (2019 Calendar year to date)

- 7,014 Water Watcher Contacts
- 1,640 Water Usage Reviews

Customer Calls – September

- 8,773 phone calls handled
- Average handling time – 4 minutes, 38 seconds per call
- Average speed of answer – 19 seconds per call

Billing – September

- 130,862 bills issued
- 0*(0.00%)* corrected bills
- 20,963 customers (16%) have signed up for paperless billing to date.

Service Orders –September (% is rounded)

- 8,323 service orders taken
- 4,095 *(*49%) move-ins / move-outs
- 946 (11%) cut-out-for-non-payment and cut-in after receiving payments, including deposits and checks for tamper
- 558 (7%) zero consumption meter checks
- 941 (12%) re-read meters
- 422 (5%) new meter sets and meter/register/ERT exchanges and equipment checks
- 374 (5%) problems / emergencies, including cut-out for customer repairs, dirty water, no water, leaks, pressure complaints, safety issues, installing water meter blankets, etc.
- 193 (2%) high-bill complaints / audit and water usage review requests
- 794 (9%) various other service orders

Remittance – September

- 27,039 mailed-in payments
- 25,367 electronic payments
- 32,924 payments via RapidPay (EFT)
- 17,396 one-time bank account payments
- 8,574 credit card payments
- 507 store payments
- 2,002 payments via drop box or at front desk

Collections –September

- 12,571 accounts received a late charge
- Mailed 8,166 10-day delinquent notices, 6.3% of accounts
- Mailed 2,303 48-hour delinquent notices, 1.7% of accounts
- 378 accounts eligible for disconnect
- 357 accounts were disconnected (including accounts that had been disconnected-for-non-payment that presented NSF checks for their reconnection)
- 0.09% write-off to revenue

Meter Statistics – Fiscal Year to Date

- 0 Meter retrofits completed
- 381 Meter exchanges completed
- 576 New business meter sets completed
- 127,479 Meters currently installed

TRUCKEE MEADOWS WATER AUTHORITY
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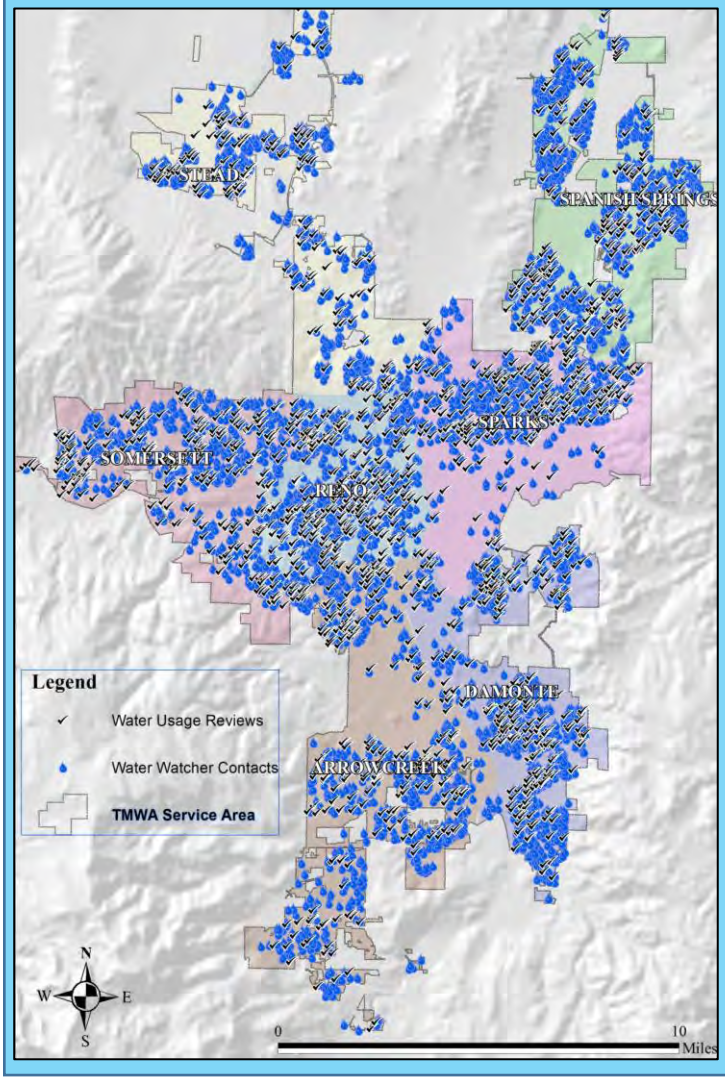
MONTHLY CONSERVATION REPORT – September 2019

SUMMARY – And just like that, the season's coming to an end. This year we made over 7,000 interactions with customers! That's 7,000 opportunities to help people become smarter about water. That's 7,000 opportunities to help people save money—and with a service territory that is growing all the time—we definitely have more opportunities ahead. I'm looking forward to another great winter and I hope to see you on the slopes! As always, thanks for reading, friends. – **Conservation Dept.**

CONSERVATION EDUCATION OPPORTUNITY MAP



Water Watcher Contact Initiation Type	
Drive-bys	6304
Deliveries	23
Hotline Reports	324
Email Reports	362
Total	**7013**

Watering Violations Observed	
Waste	1872
Wrong Day	4484
Wrong Time	827
Total	**7183**

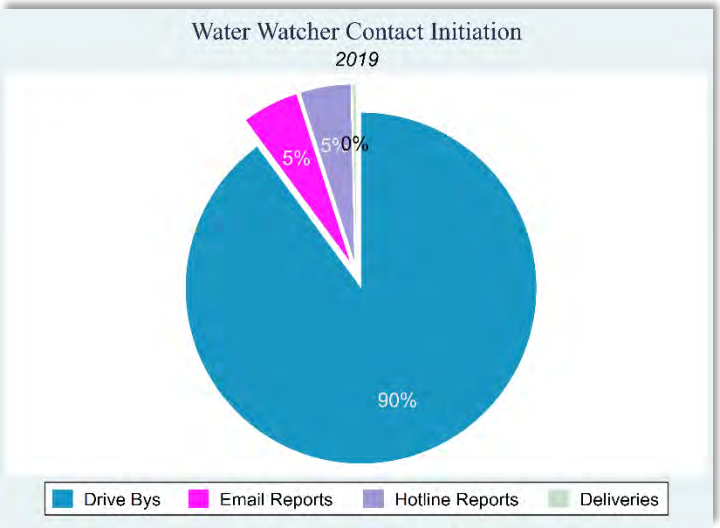
Water Watcher Actions Taken	
Educational Visits	3296
A.M. Letters	3201
Courtesy Calls	343
No Actions	171
Total	**7011**

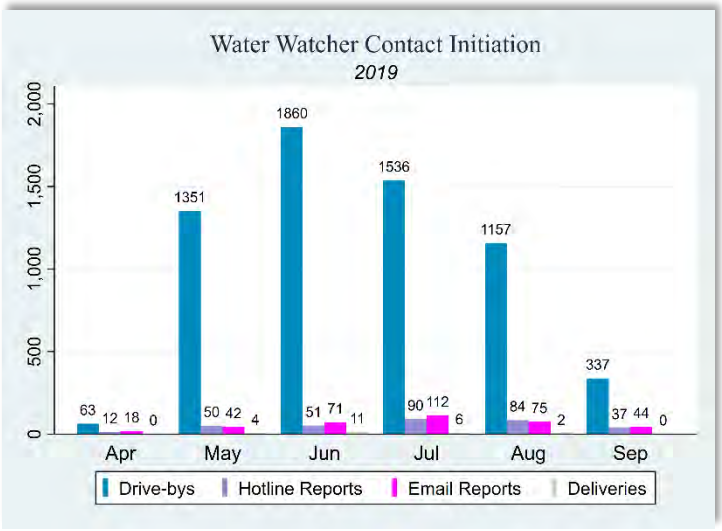
Efficiency Devices Supplied	
Faucet Aerators	0
Hose Timers	51
Nozzles	81
Low-flow Shower heads	0
Tree Root Feeder	0
Total	**132**

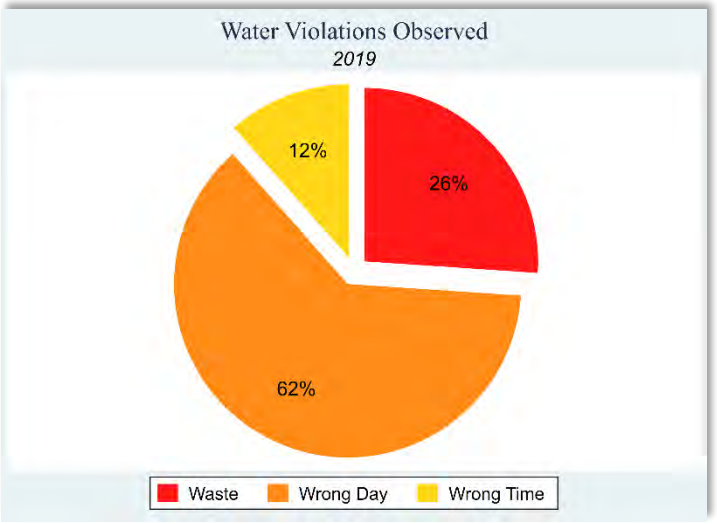
Other Conservation Actions	
Water Usage Reviews	1639
Tree Care Visits	118
Total	**1757**

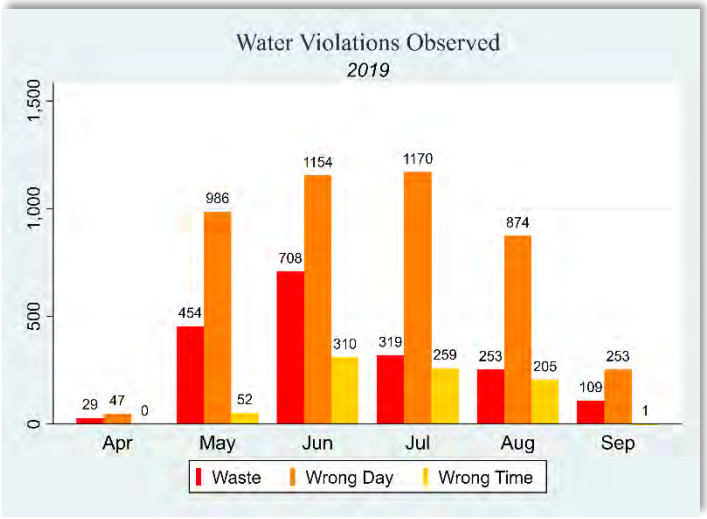
Attendees at Workshops /Tours	
Irrigation System Start-up Workshop #1	16
Irrigation System Start-up Workshop #2	6
Landscape Planning & Design Workshop	23
River-Friendly Landscaping Workshop*	6
Tree Care Workshop	20
Drip System Maintenance Workshop	19
Walking Tour - Valley Wood Park #1	12
Watershed Warrior Workshop*	2
Sprinkler System Maintenance Workshop	6
Walking Tour - River School Farm	31
Walking Tour, Part 2 - Valley Wood Park #2	30
Total	**171**

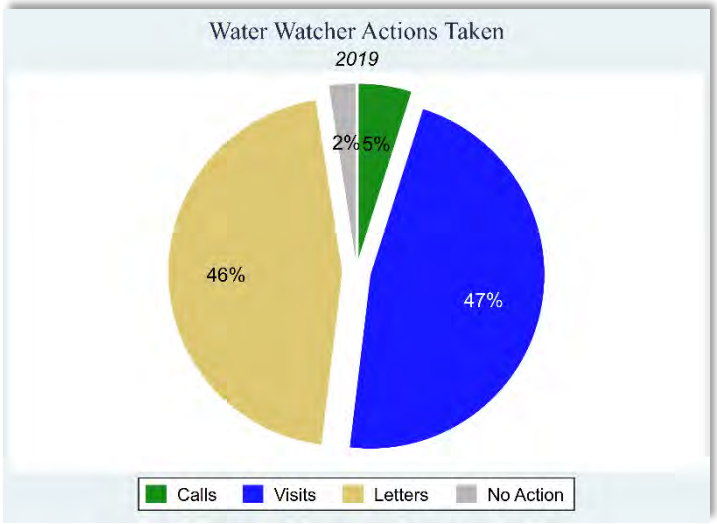
***NEW WORKSHOP FOR 2019**

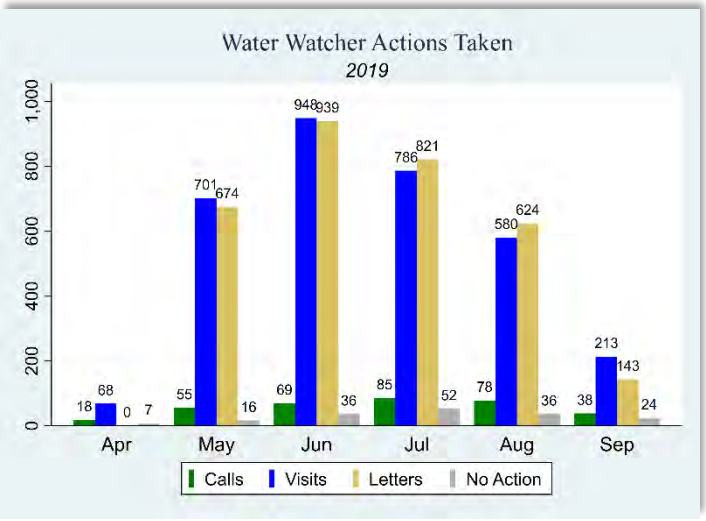

Water Watcher Contact Initiation
2019
5%
5%
0%
90%
Drive Bys
Email Reports
Hotline Reports
Deliveries


Water Watcher Contact Initiation
2019
0
500
1,000
1,500
2,000
63
12
18
0
1351
50
42
4
1860
51
71
11
1536
90
112
6
1157
84
75
2
337
37
44
0
Apr
May
Jun
Jul
Aug
Sep
Drive-bys
Hotline Reports
Email Reports
Deliveries


Water Violations Observed
2019
12%
26%
62%
Waste
Wrong Day
Wrong Time


Water Violations Observed
2019
0
500
1,000
1,500
29
47
0
454
986
52
708
1154
310
319
1170
259
253
874
205
109
253
1
Apr
May
Jun
Jul
Aug
Sep
Waste
Wrong Day
Wrong Time


Water Watcher Actions Taken
2019
2%
5%
46%
47%
Calls
Visits
Letters
No Action


Water Watcher Actions Taken
2019
0
200
400
600
800
1,000
18
68
0
7
55
701
674
16
69
948
939
36
85
786
821
52
78
580
624
36
38
213
143
24
Apr
May
Jun
Jul
Aug
Sep
Calls
Visits
Letters
No Action

TRUCKEE MEADOWS WATER AUTHORITY

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TMWA Board Meeting

Wednesday, October 16, 2019

Press Clippings

September 12, 2019 – October 9, 2019

Hunter Creek Tank

County sales tax for water projects is extended indefinitely

Steve Marcus

Treated wastewater from the North Las Vegas Water Reclamation Facility flows down the Sloan channel near Toiyabe Street and East Carey Avenue on Thursday, June 23, 2011, in Las Vegas.

By *Kelcie Grega* (contact)

Tuesday, Sept. 3, 2019 | 7:30 p.m.

A quarter-cent sales tax raising $100 million annually for water and wastewater projects will remain in place indefinitely following a decision Tuesday by the Clark County Commission.

The tax, which was approved by voters by a significant margin in 1998, has raised more than $1.4 billion over the last two decades. The 6-1 vote removes a sunset clause that would have made the tax expire in 2025. Officials from the Southern Nevada Water Authority, Clark County Water Reclamation District and other water and wastewater agencies say the tax has been vital in funding reliable water systems.

Proceeds from the tax have been put toward things like funding new treatment facilities, funding the debt service of North Las Vegas' water reclamation facility and debt service for a waterline connecting Boulder City to the River Mountains Water Treatment Plant.

John Restrepo, an independent economist with RCG Economics, said maintaining the sales tax is important for maintaining a stable revenue source for Southern Nevada's water and wastewater facilities.

"The tax base in Nevada is somewhat limited and not as broad-based as we'd like it to be," he said. "From an economic and water security standpoint, it makes sense to keep this important piece of the pie."

But some critics, like resident Ed Uehling, said the tax is "regressive" and that it "spits in the face of low-income people."

Uehling added that SNWA operates like a business taking money away from the public.

"This agency has a product to sell and can easily create a lot more money by acting like a business instead of what's being presented," he said.

Commissioner Tick Segerblom was the sole naysayer on the vote. He also felt the tax was a regressive one.

"At the end of the day, we're basically subsidizing water rates," Segerblom said. "That's $100 million a year that, looking forward, there's a lot of other things we could be doing with that $100 million besides water."

Commissioner Jim Gibson addressed these criticisms in a motion to approve the tax.

"If anyone looks at the history of the legislative work that has been done over decades, we have narrowed the tax base, exempted so many things, all designed to lift some of the burden as much as possible," he said.

On Your Side: See the top water users in Reno-Sparks

by Kim Burrows
Tuesday, September 10th 2019

Link to article w/ video of #1 User's landscape: https://mynews4.com/news/local/on-your-side-see-the-top-water-users-in-reno-sparks

Nevada just got out the longest drought in state history -- more than five years. There's always the threat of its return. We live in a desert, and water resources are scarce. News 4 wanted to know how much water our Reno-Sparks community uses -- specifically the top water users.

The top users are located throughout Reno. Most are on the west-side of town, and a couple are down south. These properties have lush lawns on sprawling acreage. Four of the top 10 water users live near Mayberry Drive and McCarran Boulevard.

The number one user is a property near Manzanita Lane and McCarran Blvd. in Old Southwest Reno. The property soaked up 3.4 million gallons on its large lawn from April through July. That bill was $11,802. For comparison, The Truckee Meadows Water Authority said -- for that same time period -- the average customer uses 13,000 gallons costing $57.32 a month.

The big house -- with an even bigger lawn -- was owned by the late William Pennington who owned several casinos and other local properties. Behind the secure gates, there are rolling green hills and a four-hole golf course. The Washoe County Assessor's Office lists the owner now as Transwestern Investments LLC.

Andy Gebhardt, the Truckee Meadows Water Authority's Director of Operations, said this property is always a topwater user.

"It's always on the list," he said.

Gebhardt said he audited the property a few years ago.

"With the square footage of grass, the acreage of grass they have, and the amount of water they use, they're actually very efficient," he said.

The bigger concern, Gebhardt said, is smaller properties that have water running down the street and sprinklers that over-spray driveways and sidewalks.

Reno resident Mike Johnson says he sees that all the time when he jogs early in the morning.

"I think you need to be responsible. We're in a growing community. We do have those lean years. I think that you have to be responsible for everything that you do," he said.

When News 4 asked TMWA if residents should be using a large amount of water just because they can afford it, Gebhardt said this: "That would be like telling you that you can't drive a big car because it uses more gasoline than a little bitty smart car."

News 4 chose not to name the owners or the addresses because they've done nothing wrong. They've not been punished for their high water use and TMWA doesn't deem them water wasters.

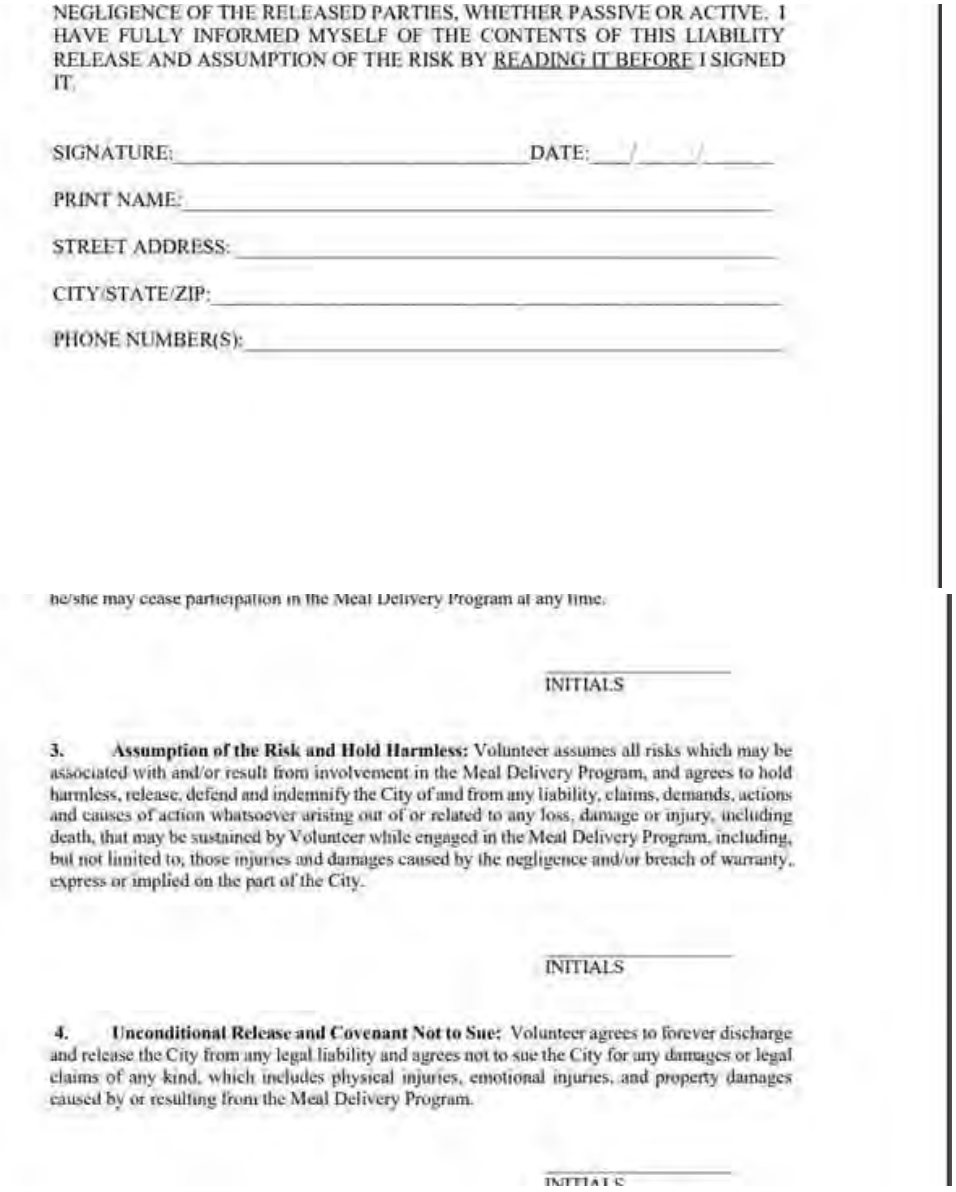
This is a top ten TMWA list of retail and public water users:

Top 10 Water Users - 201904 to 201907 v1.1 by Anonymous oG2yNlv on Scribd

Local volunteers oppose City of Reno's new liability form for feeding homeless

by Shah Ahmad

Wednesday, September 11th 2019



NEGLIGENCE OF THE RELEASED PARTIES, WHETHER PASSIVE OR ACTIVE. I HAVE FULLY INFORMED MYSELF OF THE CONTENTS OF THIS LIABILITY RELEASE AND ASSUMPTION OF THE RISK BY READING IT BEFORE I SIGNED IT.

SIGNATURE:_____ DATE:___/_____/_____

PRINT NAME:_____

STREET ADDRESS:_____

CITY/STATE/ZIP:_____

PHONE NUMBER(S):_____

he/she may cease participation in the Meal Delivery Program at any time.

_____
INITIALS

3. Assumption of the Risk and Hold Harmless: Volunteer assumes all risks which may be associated with and/or result from involvement in the Meal Delivery Program, and agrees to hold harmless, release, defend and indemnify the City of and from any liability, claims, demands, actions and causes of action whatsoever arising out of or related to any loss, damage or injury, including death, that may be sustained by Volunteer while engaged in the Meal Delivery Program, including, but not limited to, those injuries and damages caused by the negligence and/or breach of warranty, express or implied on the part of the City.

_____
INITIALS

4. Unconditional Release and Covenant Not to Sue: Volunteer agrees to forever discharge and release the City from any legal liability and agrees not to sue the City for any damages or legal claims of any kind, which includes physical injuries, emotional injuries, and property damages caused by or resulting from the Meal Delivery Program.

_____
INITIALS

RENO, Nev. (News 4 & Fox 11) — Local volunteers are fighting back against the city's new regulations on feeding the homeless.

Over the last several months, the City of Reno has been working with local volunteer organizations to improve safety and security at homeless shelters. However, after the city suggested a new liability release form, volunteers were active in sharing their distaste for it.

Last week, News 4-Fox 11 reported that the City of Reno is issuing new requirements for volunteers as part of a new liability release form. The release form comes after months of discussion between the City of Reno and local volunteer organizations on how to safely feed the homeless.

Currently, many volunteer organizations like We Care Volunteers and Loka Cares donate food every week on Record Street. The City of Reno was recently able to find a new, safer location for volunteers on Fourth Street.

Although city officials says they're finalizing the new location ,the City of Reno does not own the land.

The city would be leasing it from the Truckee Meadows Water Authority and need to come up with regulations to ensure the safety of everyone who would be at the facility. This also led to some confusion between the city and volunteers over whether or not volunteers were required to sign these documents for liability purposes.

Many volunteers were frustrated with the form, saying it asks too much of them, such as ensuring public safety and cleanliness of the facility.

"I do get that we do need to have a liability and a hold harmless agreement," explained Angela Handler, co-founder of Loka Cares, Inc, a local organization that helps donate and feed homeless people. "But I don't believe that every volunteer should have to sign it. That would be impossible. We would lose our volunteers, especially because have 50-450 new volunteers every year."

After discussing these issues in a public meeting this week, the City of Reno is drafting a new liability release form to include the input of volunteers. They say their goal is not to restrict volunteer organizations, but to make sure everybody is safe and secure.

"I think it's important to note that we are not trying to regulate any environment," reasoned Mac Venzon, Deputy Chief of Operations

Division for the Reno Police Department. "What we're trying to do is just make sure that we maintain health, safety for the folks who are going to use the area, both from a volunteer side and for those receiving meals."

As of now, volunteers will still be able to feed the homeless as normal. The City of Reno will meet with volunteer organizations again in early October to discuss and revise a new draft of the liability release form.

UA-led Study Measures Impact of Built Environment on Water Use

Research shows housing density, lot size and other built environment measures are closely tied with water use in single-family residences. Authors say the data can help growing cities plan for their future water supply needs.

Andy Ober,
University Communications
Sept. 5, 2019
Resources for the Media

Philip Stoker

How much water single-family residences use is closely related to a community's built environment, according to a University of Arizona-led study. In particular, design factors such as vegetated land cover, housing density and lot size appear to have a strong impact on water use.

The results can provide key data for city planners and water managers looking to develop sustainable water use strategies for their communities, the authors suggest in the **paper** that was published today in the Journal of the American Planning Association.

Philip Stoker, assistant professor in the UA **College of Architecture, Planning and Landscape Architecture**, and a team of researchers focused on how water use is influenced by the built environment, which Stoker defines as "the way cities take shape – what the materials are made out of, what the land cover consists of, the arrangement of buildings and what kind of buildings are there."

The team obtained single-family residential property water-use records from 2011 in Phoenix; Salt Lake City; Portland, Oregon; and Austin, Texas. Researchers estimated models for both annual water use and water use during the summer months of June through August. The cities were selected because they each offer insights relative to the impacts of both climate change and rapid urban population growth on residential water consumption. Single-family residences are the principal form of residential development in each city and make up a large share of overall water use.

"As cities, especially in the Western U.S., continue to grow, planners need to think about their water supplies moving into the future," said Stoker, whose co-authors included then-graduate student Gabrielle Jehle, Elizabeth Wentz and Brint Crow-Miller of Arizona State University, and Matthew Bonnette of Portland State University. "With this study, we wanted to give them information to develop a strategy. We wanted to show how the planning and design of cities influence how water is used."

City Design is Key

The researchers examined the influence of five built environment measures on single-family residential water use: housing density, tax assessed value, lot size, vegetative cover and the age of housing. They found in each city, the built environment poses a stronger influence on urban water use than previously reported.

“In Austin, for example, we were able to explain 85% of the variation in water use among Austin neighborhoods with just the five measures of the built environment,” Stoker said.

Some measures impacted water use across the board. The researchers found increased vegetated cover, combined with larger lots, in newer homes, with higher assessed values, were associated with higher water use in each city.

Vegetated cover was associated with an increased water demand more than any other built-environment variable in the drier cities. The effect was greatest in Salt Lake City, where each 1% increase in average vegetated surface was tied to a 0.48% increase in annual water use and a 0.7% increase in summer use.

Higher housing density was associated with lower water use in every city except Salt Lake City, where the measure was not statistically significant.

Surprises in the Data

Stoker says researchers had expected lot size to be a consistent predictor of water use. However, those findings varied across the four cities.

In Austin and Portland, larger lots were associated with higher water use. In Austin, a 1% increase in lot size was associated with an approximate 0.32% increase in summer water use. Lot size was not significantly associated with annual or summer water use in Salt Lake City, and there was an inverse relationship in Phoenix, with larger lot size tied to lower water use.

Stoker says he was also surprised by the findings on the age of housing, as the expectation was that newer housing would be associated with lower water use because of higher-efficiency appliances. However, the opposite was true in Austin, Portland and Salt Lake City. The association was strongest in Salt Lake City, where, for every 1% increase in housing age there was an approximate 0.31% decrease in annual water use and about 0.33% decrease in summer use.

Planning for Water Efficiency

Stoker says **city planners and water managers** can use the data to work together on developing zoning ordinances, form-based codes and landscaping ordinances that can lead to more efficient water usage. Regulations could, for example, specify smaller lot sizes for future developments, or call for reduced or different types of vegetated cover on single-family properties. In implementing these regulations, Stoker says, city leaders must balance factors such as whether the water-use reduction outweighs the benefit vegetated land has on temperature-cooling efforts.

Trump Finalizes repeal of Obama-era clean water rule

PUBLISHED THU, SEP 12 2019 9:47 AM EDTUPDATED THU, SEP 12 2019 4:09 PM EDT

Emma Newburger@EMMA_NEWBURGER

KEY POINTS

- The Trump administration on Thursday announced a legal repeal of a major Obama-era clean water regulation that limited the amount of pollution and chemicals in the nation's rivers, lakes, streams and wetlands.
- The EPA proposed replacing the 2015 water rule in December after an executive order from President Donald Trump, who has criticized the regulations for curbing the rights of farmers, real estate developers and landowners.
- Environmental groups condemned the move, claiming that loosening restrictions will substantially harm the country's sources of safe drinking water.

Republican presidential nominee Donald Trump speaks after a tour of the Flint water plant on September 14, 2016 in Flint, Michigan.
Mandel Ngan | AFP | Getty Images

The Trump administration on Thursday announced a repeal of a major Obama-era clean water regulation that limited the amount of pollution and chemicals in the nation's rivers, lakes, streams and wetlands.

The rollback of the Waters of the United States rule was announced by Environmental Protection Agency Administrator Andrew Wheeler at an event in Washington at the headquarters of the National Association of Manufacturers, a trade group that has pushed for its repeal and replacement.

The EPA proposed replacing the 2015 water rule in December after an executive order from President Donald Trump, who has criticized the regulations for curbing the rights of farmers, real estate developers and landowners.

The new rule limits the number of waterways the federal government can protect from pollution, including ditches, storm water control facilities and groundwater systems. It would also limit the government's oversight to larger bodies of water. The repeal could take effect in just a few weeks.

The clean water rollback is the latest in a string of moves by the administration to dismantle major environmental protections against pollutants, from curtailing regulations on methane emissions and energy-efficient light bulbs, to pushing for oil and gas drilling in the Arctic National Wildlife Refuge.

Environmental groups condemned the move to weaken water regulations, claiming that loosening restrictions will substantially harm the country's sources of safe drinking water and habitats for wildlife.

The Obama rule was developed to limit pollution in roughly 60% of the country's bodies of water. It gave the federal government the authority to oversee a wide range of lakes, streams and wetlands that connect to large water

"The clean water rule represented solid science and smart public policy. Where it has been enforced, it has protected important waterways and wetlands, providing certainty to all stakeholders," said Jon Devine, director of federal water policy at the Natural Resources Defense Council.

"The Trump administration's wild-eyed attempts to reward polluters, however, knows no bounds, so it is repealing these important protections without regard for the law or sound science."

In contrast, farming groups that represent a vital voting constituency for Trump support the repeal of the regulation they say had restricted them from using their property as they see fit. Other groups that support the repeal include oil and gas producers and golf course owners.

"Today's final rule puts an end to an egregious power grab, eliminates an ongoing patchwork of clean water regulations and restores a longstanding and familiar regulatory framework while we consider public comments on our proposed revised definition of waters of the U.S.," Wheeler said Thursday.

Under the Obama rule, some farmers using land near water bodies were restricted from several types of land use, including plowing and planting, and would need permits from the EPA to use chemical fertilizers and pesticides that could run off into water on their property.

"The millions of children newly back to school could give this administration's officials a basic science lesson: wetlands and streams connect to larger rivers. They are vitally important to protecting water quality for all of our communities," said Bob Irvin, president of advocacy group American Rivers.

"The destruction we cause upstream impacts our neighbors downstream."

Plugging along

Washoe County tries new flood protection measure

By Jeri Davis

This article was published on 09.12.19.

The North Valleys have long suffered from flooding problems, but wet weather over the last three years has made the situation particularly bad in Stead and Lemmon Valley.

In Lemmon Valley, residents living near Swan Lake have grown used to the flooding prevention measures in place there. They include things like diesel-fueled pumps and large barriers called HESCOs, with which some people may be unfamiliar.

Crews apply bentonite clay to a portion of the HESCO barriers around Swan Lake on Sept. 3. COURTESY/WASHOE COUNTY

Learn more about flood mitigation in Lemmon Valley here: **www.washoecounty.us/lemmon-valley**.

“They're pretty clever,” said Dylan Menes, a senior Washoe County engineer. “They've saved a lot lives—because they were used in Afghanistan and Iraq. They're still being used as protection for the troops to stop bullets and car bombs and stuff like that. You take what's called ‘welded wire' or welded steel mesh that's in a series of squares that are linked together and then create a cube with that steel mesh. And then, within that, you place a heavy, geo-tech style of felt, and then you pour sand in there. The felt keeps the sand in, and it becomes a very massive and slightly flexible, adaptable barrier.”

HESCO barriers can be put up quickly and maintained over long periods of time. And early in September, Washoe County tried an experiment to see if the barriers could be made more effective.

“HESCOs work very well,” Menes said. “They're very resilient. They've done a good job for us, and we're very happy with them. But they can seep a little bit of water underneath—and sometimes through the seams of the big cubes. They're about four-foot-by-three-foot-by-three-foot cubes. And that's what we're seeing, a little bit of seepage—but they're performing well, and they're doing their job, for sure.”

To see if the seepage could be stopped, the county purchased 12,000 tons of bentonite clay and applied it to a section of the four miles of HESCO barriers around Swan Lake.

“We had two different gradations [of clay],” Menes said. “One was a finer gradation, and one was three-inch chips. And they came in different ways. One came in a giant sack called a ‘super sack.' The other came in small, 50-pound bags. The 50-pound bags, our crews just laid them out in the proper quantities on the top of the HESCO walls, and then we cut them open and poured them into the water and adjusted them as it settled into the water. The larger super sacks required some heavy equipment. We first put that into a dump truck. From the dump truck, we put into a front loader—a kind of equipment that has a long, wide front bucket—and then we very delicately but that over the HESCOs and dumped it in slowly in a controlled fashion.”

As of Sept. 9, Menes reported that the bentonite clay appeared to be working, at least to some degree.

A HESCO barrier after bentonite was applied to it.

“So this is a trial experiment,” he said. “And it's not the ideal way to apply it, but it's one of the ways we can at this point. And it's been six days now. We've had some rain storms in between, and it looks like it has worked somewhat. It hasn't quite knocked all of the water out, like our highest expectations would be. But we have noticed a decrease in water seepage. I mean, we haven't seen enough to make a decision whether to use it more yet.”

Menes also said the county may use bentonite in different ways in the future, including possibly incorporating it directly into new HESCO barriers along with the sand that usually fills them. One of the main reasons the county is keen to experiment with bentonite is that—if effective—it has the potential to reduce the costs of flood control at Swan Lake.

“Depending on the season, we've had upward of 40 pumps around the lake pumping that seepage water back into the lake,” Menes said. “Those pumps also serve another purpose, which is whenever it rains, we've created a barrier that prevents the storm water from going into the lake, which can create it's own set of problems with flooding. So the pumps also take that storm water and pump that into the lake, too. These pumps have to be maintained. We've got to keep diesel in them. We're constantly adjusting them and tweaking them. We have a vendor that helps us with that. And we spend a lot of money doing that—between $100,000 and

upward of $250,000 a month in maintaining this pump system—to protect the residents of Lemmon Valley … to keep the lake in the lake."

The bentonite cost the county $4,090. For now county engineers plan to keep an eye on the barriers—which are monitored daily—and see how the bentonite clay they've added to them performs as they continue work on other flood management projects.

"There's a lot of work going on regionally with our partners, the City of Reno and RTC," Menes said. "And one of the things the county is working on with the engineering community is the Regional Hazard Mitigation Plan, which is countywide. But there's obviously a huge focus on the North Valleys now, where there hadn't been in the past. We're focusing most of our regional mitigation planning on Swan Lake. What that consists of is—we have a number of stakeholders from the engineering community and other agencies. We're sort of evaluating the nuts and bolts of a series of alternatives for hazard mitigation for Swan Lake."

They're looking for long-term solutions to flooding hazards at the lake. While effective for the time being, the HESCO barriers and pumps aren't intended to be permanent fixtures of the lake.

"We don't want them to be there forever—definitely not," Menes said.

But as to what long-term solutions might look like, he said, that's still unclear.

"We're just looking at them right now—we're not even into feasibility—but there's levees, pumping out of the hydro-basin," Menes said.

For now, though, long-term solutions and the Regional Hazard Mitigation Plan that will contain them are still a ways off.

Nevada Dam Modified to Let Threatened Trout Migrate from Pyramid Lake Toward Tahoe

September 14, 2019 at 2:15 pm

RENO (AP) — Federal officials are making fish-friendly modifications to a northern Nevada dam that for more than a century has blocked off native spawning grounds for a threatened trout species that once migrated 120 miles upstream from a high-desert lake to the alpine waters of Lake Tahoe Officials for the U.S. Bureau of Reclamation, Fish and Wildlife Service and Pyramid Lake Paiute Tribe broke ground Tuesday for a $23.5 million fish-passage project to help Lahontan cutthroat trout navigate the Truckee River's Derby Dam about 20 miles east of Reno.

As soon as next fall, fish screens in a bypass canal longer than a football field will allow the trout — once believed to have gone extinct — to get past the dam for the first time since it was built in 1905.

Water flows through the Derby Dam about 20 miles east of Reno where the U.S. Bureau of Reclamation launched a $23.5 million fish passage project to help threatened Lahontan cutthroat trout pass upstream to their native spawning grounds. (AP Photo/Scott Sonner)

Commissioned by President Theodore Roosevelt, the dam was part of the first major irrigation system established in the West to "help make the desert bloom," diverting water to farmers and ranchers in a region where only about 5 inches of rain falls annually.

"This day is 100 years in the making," said Jody Holzworth, deputy regional director of the U.S. Fish and Wildlife Service. "The fish screen will allow this iconic species to travel beyond Derby Dam, from Pyramid Lake to their spawning grounds, for the first time in more than a century."

Lahontan cutthroat trout, the state fish of Nevada and largest trout in North America, used to grow as large as 60 pounds when they would climb 2,500 feet through mountain river canyons to Lake Tahoe, elevation 6,228 feet.

A Lahontan cutthroat trout caught at Pyramid Lake in 2019. (U.S. Fish and Wildlife Service photo by Greg Ritland via AP)

Tribal leaders and state and federal wildlife officials have been working for two decades to restore the fishery in Pyramid Lake — a remnant of ancient Lake Lahontan, an inland sea that covered 8,450 square miles of western Nevada during the Ice Age. The Lahontan cutthroat trout also are native to parts of Oregon, Utah and Wyoming.

Dan Mosley, executive director of the Pyramid Lake Fishery for the Pyramid Lake Paiute Tribe, said the tribe has a long history of "fighting for the fish."

"They are really important in our stories and our culture," Mosley said.

In recent years, the fish have made their way several miles upstream from Pyramid Lake but haven't been able to get past the Derby Dam.

The trout was thought to have gone extinct in the 1940s and was listed as threatened in 1970. But a remnant population later was discovered in a small brook on Pilot Peak along the Nevada-Utah border.

Beginning in 2006, that population has been used to successfully restock Pyramid Lake, where Holzworth said anglers now regularly catch cutthroats as big as 25 pounds.

Cutthroats successfully spawned in Pyramid Lake in 2014 for the first time in 80 years and this year, 775 successfully spawned in the river between the lake and dam.

The bypass canal will include an 80-foot-wide, 390-foot-long horizontal fish screen — actually a metal plate with slots that pushes water down through the water system while sending the fish and other debris through the side channel.

The Farmers Irrigation District of Hood River, Oregon first developed what is now known as the "Farmers Screen" after severe flooding in 1996. The district licensed the patent to the nonprofit Farmers Conservation Alliance which since has completed 50 similar projects in several Western states.

This one is the largest and the first the Bureau of Reclamation has commissioned.

"It's a milestone in the history of Reclamation," Bureau Commissioner Brenda Burman said Wednesday, "a critical investment in modernizing our infrastructure to provide reliable water supplies in an environmentally sound manner."

Tougher arsenic standard shows desired effect: Publics drinking water is safer

by Oregon State University

Credit: CC0

Public Domain

Toughening the federal standard for arsenic in 2001 has led to fewer violations by the public systems that supply more than 80 percent of the United States' drinking water, research led by Oregon State University shows.

Researchers found that despite lower allowable arsenic levels, the percentage of public water systems in violation fell from 1.3% in 2008 to 0.55% in 2017, with most of the violations occurring in a handful of counties in California and Texas. In terms of number of people drinking out-of-arsenic-compliance water, the figure fell nationally by more than 1 million, dropping to about 450,000.

"This reinforces the point that safety regulations do work, especially when they come with a carrot-and-stick approach, like increasing resources for systems to comply and giving them flexibility to choose what works best for their community," said the study's corresponding author, Molly Kile, associate professor in OSU's College of Public Health and Human Sciences.

Findings were published today in *Environmental Science and Technology*.

Sprinkled throughout the Earth's crust, arsenic is a naturally occurring element also found in air, food and water. In the United States, it's particularly common in the West and Southwest, as well as the Northeast and the Great Lakes area.

The International Agency for Research on Cancer categorizes arsenic, which in water is tasteless, odorless and colorless, as a Group 1 human carcinogen, the most severe category that also includes compounds such as asbestos, formaldehyde and mustard gas.

Chronic ingestion of arsenic increases the risk of cancer in the lungs, bladder, liver, kidneys and skin. Arsenic has been federally regulated as a drinking water contaminant since 1942.

Arsenic can leach into ground water through rocks and soil, and has been used in the manufacture of pesticides and wood preservatives. Mining processes, volcanic activity, erosion and forest fires can also cause arsenic to reach the environment.

In ground water used for drinking, arsenic is a widespread problem. Arsenic levels tend to be higher in drinking water that comes from ground sources like wells rather than from surface sources like lakes and reservoirs.

"You can't know whether it's there unless you test for it," Kile said.

Once in the body, arsenic disrupts the cellular process that produces ATP, the molecule responsible for storing and transporting the energy needed for life. In both blocking and

competing with the chemicals that form ATP, arsenic affects a broad range of organs and systems.

Kile, Oregon State graduate student Stephanie Foster and collaborators from the U.S. Environmental Protection Agency, which partially funded the research, analyzed 12 years of data from the Safe Drinking Water Information System; the system is a public EPA database, established by the 1974 Safe Drinking Water Act, of drinking water contamination violations.

The first year of the tracking period, 2006, was five years after the EPA reduced the maximum contaminant level for arsenic with the release of the Final Arsenic Rule, or FAR.

Prior to 2001, drinking water distributed by U.S. public systems—which number greater than 150,000—could contain up to 50 micrograms of arsenic per liter. The FAR cut the allowable concentration to 10 micrograms per liter.

The FAR, which also mandated better detection and monitoring, went into effect in January 2006; as expected, the number of municipal water systems in violation immediately spiked, since many systems that had been compliant under the old rule no longer were.

But it didn't take long for things to turn around.

"And smaller suppliers showed the most improvement," Kile said. "Part of the controversy around lowering the standard was the economic impact it would have on small systems, but this study shows those systems can adapt and overcome."

Foster noted that after the initial upswing when the new maximum contaminant level went online, arsenic violations in public water systems have consistently happened less frequently. Efforts to reduce the use of arsenic in industry likely are contributing to less public arsenic exposure as well, Kile said.

"Improvements were seen in both ground water and surface water systems," Foster said. "It was also great to have our findings supported by another recently published article by OSU graduate Barrett Welch. He found that urinary arsenic levels among public-water users across the United States also significantly decreased during the time period we studied. This shows that people really are ingesting less arsenic."

The violations found in this research tended toward the western and southwestern regions of the United States, which have geological conditions that lend themselves to elevated arsenic. In the states where violations ran higher, there were usually a small number of counties responsible, suggesting highly localized reasons for the violations.

Kile stresses that this research covered only public drinking water supplies, not wells or any other private sources.

"Those are the responsibility of the owner, and there are many resources available to help people test for arsenic, and if you use a private water supply, you definitely should test for arsenic, along with bacteria and nitrates," she said. "When people drink city water, they do so under the assumption that it is safe. Delivering on this promise requires constant vigilance. It also requires revising regulations and making sure they reflect the best available science. This means regulations change over time to protect our health, and this study demonstrates that with proper support, organizations can comply and will comply with tougher regulations to protect the public's health."

Kile adds that the institution of the Final Arsenic Rule, which included financial assistance to water systems for treatment improvements and gave water systems flexibility on how they would meet the new standards, began with Bill Clinton in the White House and concluded with George W. Bush as president.

"It's an example of presidents continuing to work on important programs that started before they took office and not rolling them back," she said. "The FAR took concerted political effort and will, and it's working."

Explore further

Former Nevada Governor Brian Sandoval Joins Tahoe Fund's Council of Special Advisors

Sandoval looks to further his legacy of support for Lake Tahoe in new role

INCLINE VILLAGE, Nev. (Sept. 17, 2019) – The nonprofit Tahoe Fund announced today that former Nevada Governor Brian Sandoval has joined its Council of Special Advisors. Sandoval has a history of supporting Tahoe through his work as Governor of Nevada and as a past board member of the Tahoe Regional Planning Agency. In addition, in his role as Chair of the Nevada Department of Transportation, he played a critical role in bringing the Tahoe East Shore Trail to fruition; a project in which the Tahoe Fund was one of 13 participating agencies. While serving in the Nevada legislature, Sandoval was on the TRPA Oversight Committee and was a member of the Natural Resources, Mining and Agriculture Committee for two terms, each of which had jurisdiction over Tahoe related bills. Sandoval is the second to be appointed to the new advisory council, joining former Tahoe Fund board member and long-time Tahoe advocate Steven Merrill.

"On behalf of the Tahoe Fund board of directors, we are excited to have Governor Sandoval join our Council of Special Advisors," said Tim Cashman, former Tahoe Fund board chair. "He has an impressive resume and is someone who has been a champion of Tahoe for many years. We're thrilled he has agreed to join our efforts to build a sustainable future for Lake Tahoe."

The Tahoe Fund's Council of Special Advisors was created to encourage the involvement of influencers who have demonstrated care and concern for Lake Tahoe and are willing to help advise and provide assistance to the Board of Directors. Specifically, members nominated to this advisory group will weigh in on the organization's strategic direction, provide counsel on issues facing Lake Tahoe and help introduce other supporters and partners to the Tahoe Fund.

"I've long been a supporter of the work the Tahoe Fund has done on behalf of the environment and to encourage stewardship of the Tahoe Basin. Joining the Council of Special Advisors will allow me to continue to contribute to the ongoing work and success of the organization," said former Governor Sandoval. "I look forward to jumping right in and lending my time and experience to the Tahoe Fund."

The Tahoe Fund is a nonprofit organization that supports environmental improvement projects that restore lake clarity, expand sustainable recreation, promote healthier forests, improve transportation and inspire greater stewardship of the region. Learn more about the Tahoe Fund at www.tahoefund.org.

TAHOE FUND

Together Creating a Legacy

About Tahoe Fund

The mission of the Tahoe Fund is to use the power of philanthropy to improve the Lake Tahoe environment for all to enjoy. The organization focuses on environmental improvement projects that restore lake clarity, expand sustainable recreation, promote healthier forests, improve transportation and inspire greater stewardship of the region. Through the generous support of private donors, the Tahoe Fund has leveraged more than $2 million in private funds to secure more than $40 million in public funds for more than 35 environmental projects. The projects include the new Tahoe East Shore Trail and other new sections of the Lake Tahoe Bikeway, restoration of watersheds, removal of aquatic invasive species, forest health projects, and stewardship programs.

What's Being Done To Address Flooding At Swan Lake

By LUCIA STARBUCK • SEP 17, 2019

KUNR Public Radio: Local News Feed
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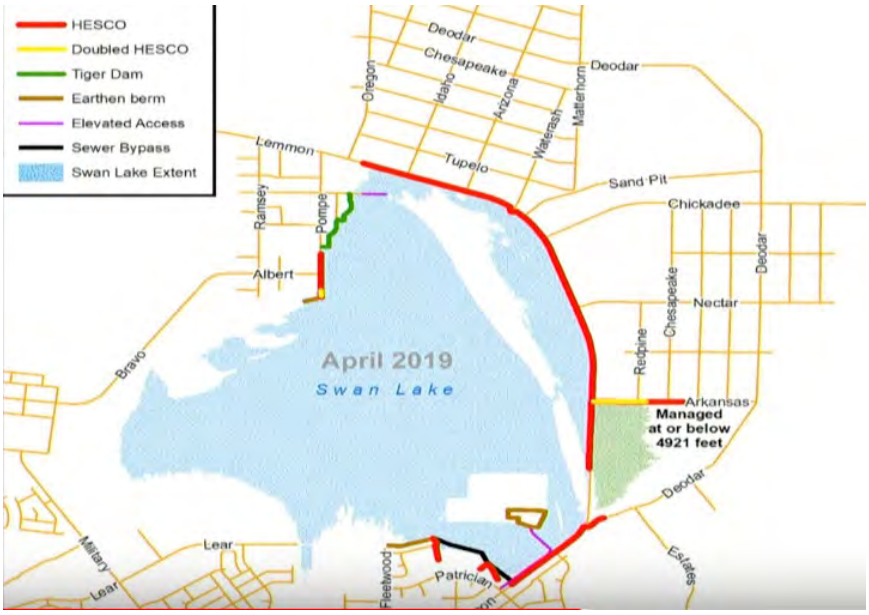
Previous flooding in Lemmon Valley
BOB CONRAD / THISISRENO

Different solutions have been proposed to reduce water levels from the flooded Swan Lake in Lemmon Valley, a battle that has been affecting nearby residents since 2017. KUNR's Lucia Starbuck spoke with *ThisisReno*'s Bob Conrad about what's been done, what can be expected, and how some residents are feeling.



A map of existing flood barriers constructed around Swan Lake presented on August 27, 2019 at a Washoe County meeting by Washoe County Engineer Dwayne Smith.

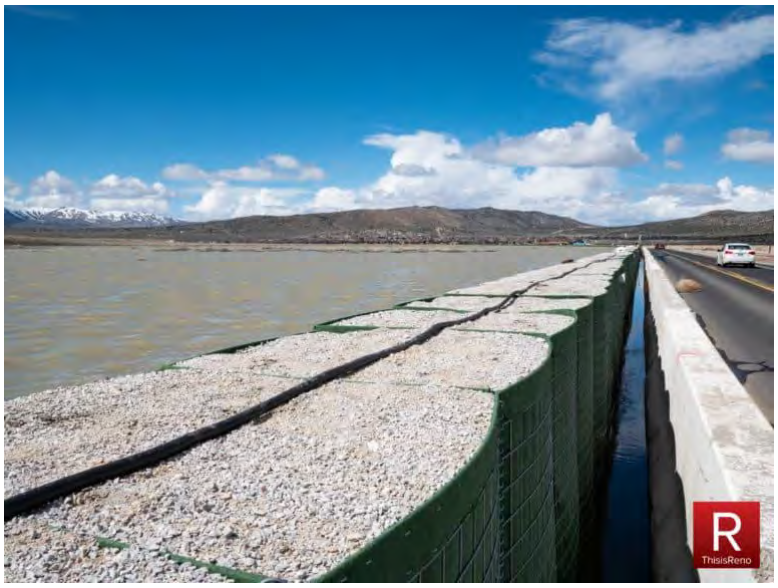
Measures are currently in place to mitigate the floodwaters at Swan Lake, including HESCO flood barriers surrounding the lake, which stand four feet high and extend four miles around the lake, according to Washoe County. Additionally, there are pumps located around the lake to put excess water that's collected back into the lake, according to a recent press release from the county.

ThisisReno's Bob Conrad has been covering this issue, following meetings and talking to residents.

“We’ve seen, basically, a tremendous amount of moisture, and that has, basically, flooded Swan Lake to the point where it's gone into people's homes. It's affected the livelihoods of Lemmon Valley residents and, basically, just caused a pretty big problem out there for the people that live out there. They're very frustrated,” Conrad said.

The county has now proposed the construction of a pipeline. This pipeline will feed out of Swan Lake to water newly created agricultural fields. The project will cost $2.5 million in county funds from the sales of water rights, Conrad reports. It is expected to take three-to-five years to reduce the water level of Swan Lake to a point that it’s no longer affecting residents nearby.

According to Conrad, residents have been concerned about more than the flooding. Questions have been raised about the quality of water in Swan Lake. Reno/Stead Water Reclamation Facility has been surrounded by floodwaters; it is treating water coming in and feeding water into Swan Lake. The county assures that the water is safe for recreational purposes and is similar to that of Washoe Lake, the Sparks Marina and Virginia Lake.



Existing HESCO barriers along Swan Lake on Lemmon Drive in Lemmon Valley. CREDIT BOB CONRAD / THISISRENO

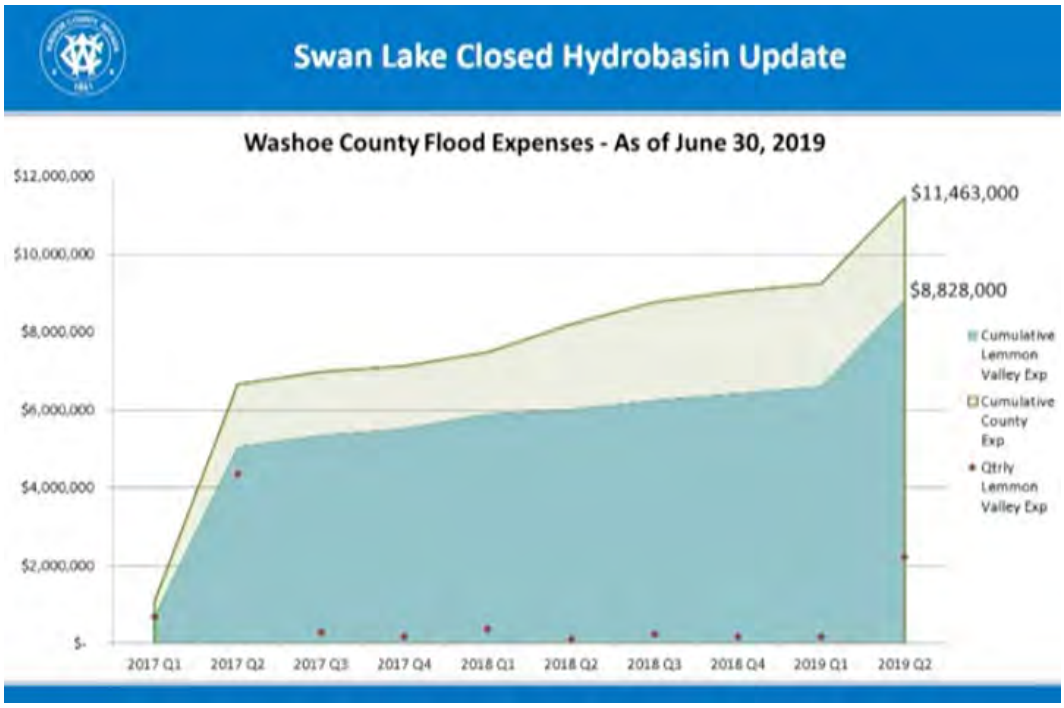
In addition, North Valleys residents want to see a moratorium on development around Swan Lake. Some residents say that development is increasing the amount of impervious surfaces. Impervious surfaces can include roads and parking lots that repel water, instead of letting it soak into the ground. As a result, the water gathers. Residents say that development has caused flooding and other impacts.

“A lot of people who live in those areas see the impacts of development,” Conrad said. “If there's an accident on 395 heading out to the North Valleys on any given day, it can back up traffic for a long ways, for a long time, and the more that gets developed out there, obviously, the more traffic there's going to be. The residents would like to see a halt to development. The City of Reno has not gone there yet, and they are actually relying on developers to help with some of these infrastructure impacts--widening lanes, raising Lemmon Drive, and all those kinds of things," Conrad said.

Some of the Washoe County staff and contractors have actually been facing harassment while working to maintain the existing flood barriers, Conrad wrote in his most recent article. Washoe County Engineer Dwayne Smith spoke about this issue at a Washoe County Commission meeting on August “This has been a concern of mine, and also I’ve heard it voiced by the City of Reno. We have concerns for our field staff. There’s been a lot of swerving of cars when we’ve had guys out working, guys and gals out working. They’ve been swerving and splashing our guys,” Smith said. “We’ve had staff come in and tell us there’s been a lot of flipping of people off and yelling obscenities at them.”

There is no official timeline for when the flooding issue at Swan Lake will be solved. Washoe County has spent $11.5 million since 2017 on countywide flood responses, with $8.8 million being devoted to Swan Lake.

27.



A graph of county spending on flood responses presented on August 27, 2019 at a Washoe County Commission meeting by Washoe County Engineer Dwayne Smith.

Uploaded: Thu, Sep 19, 2019, 9:32 am by Gennady Sheyner / Palo Alto Weekly

Palo Alto looks to sell, treat — and possibly ask people to drink — wastewater

City considers major deal with Santa Clara Valley Water to build new plant, sell effluent to the county

Golfers at Shoreline Golf Links play a hole adjacent to a pond on April 7. The pond is a blend of fresh water and recycled water from the city of Palo Alto. Photo by Veronica Weber.

A sign at the Shoreline Golf Links golf course in Mountain View displays how the course is irrigated by recycled water. Palo Alto is exploring a new deal with Valley Water and Mountain View that would expand use of recycled wastewater. File photo by Veronica Weber.

In an effort to open the spigot on recycled water in the region, Palo Alto and Santa Clara Valley Water are exploring a deal that would send the city's wastewater to a treatment plant elsewhere in the county, where it would be treated, transformed into potable water and potentially resold to the city for its residents and businesses.

The proposed deal would give Palo Alto a new source of drought-proof water to draw on in case of emergency. Though the concept is new to Palo Alto, Valley Water -- the giant water district that serves most of Santa Clara County -- has had positive experiences with treating wastewater and reusing it, according to Garth Hall, deputy operating officer of Valley Water. It has been operating a plant on Zanker Road in San Jose since 2014, delivering water to an area that includes most of San Jose, as well as Milpitas, Serrano and Santa Clara.

The agreement, which the district is now negotiating with Palo Alto and Mountain View, would first require the cities to lower the salinity of their wastewater before sending it for further purification. Doing so would entail construction of a new desalination plant at

the Regional Water Quality Control Plant in the Palo Alto Baylands, a facility that today processes the effluent of Palo Alto, Mountain View, Los Altos, Los Altos Hills, Stanford University and the East Palo Alto Sanitary District.

Under the tentative terms of the agreement, Valley Water (which until this year was known as the Santa Clara Valley Water District) would contribute $16 million to help Palo Alto build the $20-million plant. In addition to being turned into potable water, the less salty wastewater could also be sold to more customers for irrigation and other non-potable uses.

A major provision of the proposed agreement calls for Palo Alto to transfer about half of the treated effluent to the other location for further treatment and reuse. Valley Water would be expected to set up a transferring system for the wastewater within 13 years, after which time it would receive effluent deliveries from the Palo Alto plant for the next 63 years. The long time frame is needed to "justify the large capital investment and meet Valley Water's long-term water-supply-planning objectives," according to a new report from the Department of Public Works.

If approved by the City Council and by the city's wastewater-plant partners, the agreement would significantly expand the reach of the city's recycled water, which today is used for irrigation in Shoreline Park and at the Baylands Links Golf Course. The desalination plant would allow about 60 commercial customers in Mountain View to instantly join the system.

Palo Alto's experimentation with turning treated wastewater into potable water would be a significant shift for the city, which currently gets about 85% of its water from the Tuolumne River in Yosemite (the remainder comes from local reservoirs) and which takes great pride in the water's pristine quality.

As such, the Valley Water plan may end up pitting Palo Alto's environmental bona fides against the "ick" factor of drinking treated effluent.

But it may be an idea whose time has come: The council last year signaled its support for the Bay Delta Plan, which would require the Tuolumne and other tributaries of the San Joaquin River to have "unimpeded flow" of at least 40% between February and June. The Public Works report notes that adoption of the Bay Delta Plan would reduce the amount of Tuolumne River water available during dry years to Peninsula cities like Palo Alto, which get their water from the San Francisco Public Utilities Commission through the Hetch Hetchy system.

The San Francisco PUC has publicly opposed the plan, characterizing it as a threat to the region's water supplies.

"The decision to support the Bay Delta Plan reaffirmed council's commitment to reduce the city's dependence on imported water," the report states. "Water reuse is one of a limited number of water-supply alternatives to imported water," the report states.

As part of the agreement, Palo Alto would gain assurance that if its water allotment falls short -- either because of a drought or because of new state regulations -- it would be able to tap into Valley Water's water supplies.

The deal would also bring new revenue to Palo Alto and its wastewater plant partners. Once Valley Water installs the necessary pipelines to transfer the treated wastewater, it would pay $1 million annually to the cities. That funding would be distributed based on how much effluent each city has contributed to the plant.

At a meeting of the Utilities Advisory Committee earlier this month, staff from Public Works and Utilities departments touted the environmental benefits of the proposed partnership with the Water District. For one thing, the deal would cut down waste: In 2018, the plant treated 19,447 acre-feet of wastewater, of which 96% was discharged to the bay and the remainder was used for irrigation in Palo Alto and Mountain View.

Phil Bobel, assistant director in the Public Works Department, also said the new plant would cut the salt levels in the treated water by half, from the current level of 800 parts per million to about 400 parts per million. As such, it would assuage concerns from irrigators that the current recycled water would harm redwood trees and other sensitive plants.

Karla Dailey, senior resource planner at the Utilities Department, highlighted the value of having another supplier that the city can turn to if for some reason the San Francisco Public Utilities Commission has to reduce its allotment to Palo Alto. The city currently gets about 10 million gallons per day from the system.

"It's another tool that Palo Alto would have in its tool-belt down the road as the future unfolds and as we see what happens with climate change and regulations and the state and all the other things that will not be known for a while," Dailey said.

The city's proposed agreement with Valley Water is the latest example of Palo Alto's increasingly regional approach to planning for future water supply. Palo Alto serves on a recently formed Joint Recycled Water Advisory Committee, which also includes Mountain View and East Palo Alto. Also, it has recently agreed to shift some of its allocations of Hetch Hetchy water to East Palo Alto, where supply challenges temporarily halted development.

Gary Kremen, Palo Alto's representative on the Valley Water board of directors, lauded the deal and said the most important thing Palo Alto would get is a "guaranteed call option to our diverse water supply," which includes water from various regional

systems, some spanning as far as Redding. The city will also get the assurance of knowing that its recycled water is pure enough to be safe for local trees, Kremen said.

"What is the value of being able to assure that Palo Alto's foliage and trees are there? You cannot pay enough for that -- unless you're anti-trees," Kremen said.

The commission largely approved the tentative plans, though Chair Michael Danaher urged staff from the city and the water district to include some assurances in the contract that would not only guarantee the water supply but also ensure a reasonable price. Because both entities are public agencies, the water would be sold "at cost," with neither agency making a profit.

Palo Alto and Valley Water aren't the only entities taking a more aggressive approach on recycled water. Los Angeles is moving ahead with a $2 billion project to recycle water and make it potable, with the goal of reducing its imported water by 35% and aid the city's goal of recycling all of its wastewater by 2035, according to the staff report.

San Diego is moving ahead with a recycled-water project under the Pure Water San Diego Program that would provide roughly a third of the city's water supply by 2035.

The Los Angeles effort focuses on "indirect potable reuse," in which water is purified by going through an environmental buffer such as a groundwater basin (this is in contrast to "direct potable reuse" systems, in which treated wastewater goes directly to the water-distribution system). The San Diego project, also considered "indirect potable reuse," calls for water detention at a surface reservoir before it goes to the water distribution system.

Commissioner Lisa Forssell lauded the new Palo Alto proposal, which she said both looks out for the city's interests and considers the needs of the larger region.

"If we aren't using our effluent and there are others in the region who can turn effluent into a valuable water resource, that's something that's worth pursuing," Forssell said.

The City Council will discuss the proposed agreements this Monday.

Smart treatment, smart investment: New report details impact investment strategies in water

By Peter Yolles and Cynthia Koehler

Newsflash: our water-stressed, climate-changing world is a major resilience challenge for communities. But there's also an upside to meeting this challenge. Building resilient water solutions can create important, and sometimes catalytic, opportunities for private investors.

That's especially so in the wastewater treatment world. It's not sexy, but treating dirty water is essential to a sustainable water future. A lot of money is being spent to do so, and a cutting edge new report details how those capital streams could be deployed for good.

The new report details the investment opportunities associated with a global shift from centralized wastewater treatment (read pipes, pumps, and big smelly plants) to innovative on-site wastewater treatment technologies. These treatment solutions work where the wastewater is generated, instead of miles away at a treatment plant. That means major energy savings (read climate benefits), capital savings, and the ability to right-size a solution for the contaminants at hand. In other words, distributed solutions are often cheaper, more advanced, and more effective.

The investment opportunity in localized, on-site treatment systems is particularly ripe in the food and beverage industry in the USA and other Global North countries. There are dozens of tested technologies and businesses ready and willing to install these systems for industrial customers –

ranging from membranes to ceramic-filters to place-based biological treatment that look like botanical gardens. Some systems are mobile or containerized; some even generate clean water for reuse on site.

In general, as fans of the private sector point out, industrial customers are often positioned to deploy faster decision making, appreciate clear returns on investment, and have process engineers on staff to help install and maintain new systems.

We believe that the industrial sector will be a leading edge of distributed solutions for wastewater treatment, and that getting the word out to investors about the major shifts in the wastewater industry is key. At the same time, government has a pivotal role to play in setting the background rules to encourage innovation and to leverage private investment.

For example, municipalities can encourage industrial wastewater customers to install distributed systems by implementing wastewater surcharges on effluent that requires additional energy, chemicals and labor for municipal wastewater systems to handle.

Austin, TX is doing this today with their innovative surcharge program. They are also dangling a carrot as well as wielding a stick, using an awards program to recognize leaders in the private sector. These kinds of interventions effectively nudge companies to invest in localized, on-site systems.

The shift in the wastewater industry is part of a larger pattern of municipalities, business and homeowners moving toward distributed infrastructure, at a time when the expensive, concrete-based systems of the past are reaching maximum capacity. Across the board, communities are seeking less expensive, more effective, climate resilient and easier-to-install solutions for a variety of water challenges.

This broader set of distributed infrastructure solutions are as varied as permeable pavement, bioswales, rain gardens and barrels, internet-connected irrigation timers, water efficient toilet and appliance incentives, and cash-for-grass turf replacement, together promise more resilient communities. Building these distributed solutions can also reduce the load on centralized wastewater treatment plants, so their useful lives can be extended, and new plants deferred or avoided altogether.

Our work together on behalf of these smart, distributed infrastructure solutions lives at Tap Into Resilience, a new project and resource center for municipal decision-makers at all levels interested in exploring these solutions.

Peter Yolles is founder and chief policy officer at WaterSmart Software. He is also the author of the noted CREO report.

Is citizen engagement the key to smart water solutions?

Credit: Smart Cities Dive

AUTHOR

Cailin Crowe

PUBLISHED

Sept. 17, 2019

Dive Brief:

- Humans, not technology, currently serve as the sensors to detect water supply problems, Aquagenuity CEO Doll Avant told Smart Cities Dive at last week's Smart City Expo Atlanta. The lack of smart water infrastructure has been evidenced by the recent water crises in Flint, MI and Newark, NJ. "You can't have smart cities without smart water," she said.
- The first step to preventing another Newark- or Flint-like crisis is resident awareness and a desire to take more responsibility for monitoring their own water, according to Avant. "We can no longer wait on the government to handle issues like this," she said.
- Smart water technology will also be key to developing safe water practices, Avant said. She touted her own company's technology, which looks to provide data directly to citizens and governments to predict and prevent water crises. Its app and testing kit allows individuals to test water, then upload the results in real time to an accessible water quality heat map of the area.

Dive Insight:

Cape Town, South Africa almost ran out of water in 2018. The city's crisis marked the first time a prominent modern city faced the threat of water depletion. Although the worst of Cape Town's crisis was avoided due in part to a drastic change in resident habits, their situation was not an anomaly, Avant said.

Flint, MI proved to the U.S. that water safety is "not a Third World issue," she said. In fact, there are 3,000 locations in the U.S. with more lead in their water than Flint. Newark, NJ is the latest city to make headlines for high levels of lead.

While the U.S. does have "one of the safest public drinking water supplies in the world," according to the Centers for Disease Control and Prevention (CDC), water infrastructure remains one of the least disrupted municipal systems. About 6 million lead service lines are used today.

Cities like Akron, OH and Washington, DC have turned to new technology to try and get ahead of water management issues. Drones, sensors, robots and automation are helping governments turn water management into more of an exact science than an art. In Akron, for example, the city is planning to put smart meters in homes by 2021 that will help detect leaks or other issues and collect readings for billings.

The past century has taught us that the government is overwhelmed, according to Avant. By providing households with the ability to test their own water, individuals can take a proactive approach to their own health while ostensibly also saving time and money for cities.

Recommended Reading:

- MEDIUM How Aquagenuity (Where Water meets Ingenuity) Was Born
- SMART CITIES DIVE How AI and data turn city water management from an art to a science

Las Vegas water use has dropped, but its affluent residents remain copious consumers

Steve Marcus

A sprinkler waters a lawn at a home near Rancho Drive and Oakey Boulevard Aug. 29, 2013. The lawn sprinklers were running at a prohibited time and overwatering so that water flowed into the gutter.

By *Miranda Willson* (contact)

Sunday, Sept. 22, 2019 | 2 a.m.

Total and per-capita water use in Southern Nevada has declined over the last decade, even as the region's population has increased by 14%. But water use among the biggest water users — some of the valley's wealthiest, most prominent residents — has held steady.

The top 100 residential water users serviced by the Las Vegas Valley Water District used more than 284 million gallons of water in 2018 — over 11 million gallons more than the top 100 users of 2008 consumed at the time, records show. The water district covers the city of Las Vegas, unincorporated metro areas including Paradise and Winchester, and some small, rural communities.

In Henderson, the top 100 residential water users in 2018 combined used more than 207.4 million gallons of water. That's about 3.46 million gallons more than what the city's then-top 100 users consumed 10 years ago.

Properties that made the top 100 "lists" — which the Henderson and Las Vegas water districts do not regularly track, but compiled in response to records requests — consumed between 1.39 million gallons and 12.4 million gallons. By comparison, the median annual water consumption for a Las Vegas water district household was 100,920 gallons in 2018.

Las Vegas and Henderson represent a combined 86% of the Southern Nevada Water Authority's total service area, said Bronson Mack, spokesperson for the water authority and the Las Vegas Valley Water District. In both communities, property size and the amount and type of landscaping strongly influence how much water residential customers consume.

Many of the properties on the lists are hardly "typical" homes, Mack said.

“What you have here is a list of single-family residential properties that are some of our largest single-family residential properties in the valley,” he said.

The property that used the most water last year is a 15.9-acre compound owned by the family of Jefri Bolkiah, prince of Brunei. The ultra-luxurious, sprawling Spring Valley mansion, secondary buildings and pools on Spanish Gate Drive used over 12.4 million gallons of water. That’s 93 times what the average Las Vegas water district household consumed last year.

Bolkiah’s home has consistently appeared on the Las Vegas water district’s annual top user list since media organizations began requesting the data over the last two decades, Mack said.

Close behind Bolkiah’s home in water use was eBay founder Pierre Omidyar’s home in Henderson’s Seven Hills, which used over 11.5 million gallons in 2018. The property’s main house contains 33 bedrooms, 14 full bathrooms and 22 half bathrooms, according to the Clark County Assessor’s Office.

Casino mogul Sheldon Adelson’s home in Summerlin was the third biggest water user of 2018, consuming just over 11 million gallons. Two other properties on the list located in the same neighborhood also link to the Adelson family and a foundation in its name.

Red Rock Resorts Director Lorenzo Fertitta’s Summerlin home consumed the fourth-most water in 2018 at nearly 9.4 million gallons. An address tracing to California-based tech entrepreneur Lap Shun Hui came next, consuming over 6.9 million gallons of water; Hui sold the Summerlin South property in April 2019, according to the Clark County Assessor’s Office.

Several real estate developers appeared on the lists as well. Joel Laub, who plans to build homes at the former Bonnie Springs Ranch, used over 5.4 million gallons of water at his Southern Highlands home; mining magnate Jim Rhodes, who has proposed building thousands of homes at the top of Blue Diamond Hill, used 3.4 million gallons at his Spring Valley mansion; and Yohan Lowie, CEO and founder of EHB Companies and the man behind the mired plan to redevelop the closed Badlands Golf Course, used 2.7 million gallons at his Queensridge property.

Gaming executives on the lists include Golden Entertainment CEO Blake Sartini (used 3.9 million gallons), Station Casinos CEO Frank Fertitta III (used 3.3 million gallons), and Treasure Island owner Phil Ruffin (used 2.9 million gallons).

Another notable property owner was Nancy Walton Laurie, heir to Walmart, who consumed nearly 6 million gallons of water at her MacDonald Highlands home in Henderson. There’s also professional poker player Bob Feduniak, whose Southern Highlands home used over 3.2 million gallons.

Although their water consumption is still well above average, some property owners have reduced consumption in the last 10 years.

Bolkiah’s home cut water use by nearly 5 million gallons since 2008, in part by removing 73,000 square feet of water-thirsty grass in 2009, Mack said.

Compared to 2008, Omidyar’s water consumption went down by over 2 million gallons last year. Former Greenspun Media Group chairman Danny Greenspun’s water use at his Green Valley North property also dropped from over 8.4 million gallons in 2008 to 6.6 million gallons in 2018.

Adelson’s home, on the other hand, used 2.2 million gallons of water in 2008 compared to over 11 miLlion gallons last year.

“One thing we notice on the list is people kind of bounce around a little bit,” Mack said. “Someone who might have ended up in the top 10 might be 25 the next year.”

Although property size influences water use, some of the top users' neighbors have properties as large as theirs, but don't appear on the lists, Mack noted. They might have participated in the water authority's conservation initiatives, such as the water-smart landscape rebate program, which refunds homeowners who convert from grass to desert landscaping.

Modifying or reducing irrigation is the most effective way to save water, Mack said. That is especially true for homes built before 2003, when the water authority adopted stricter development codes.

Homeowners have another reason to cut outdoor water use: Water consumed outdoors is lost to the system, unlike water used indoors, which generally gets recycled and returned to Lake Mead through an energy-intensive process, Mack said.

Under the water authority's tiered pricing system, those who use more water are charged at a higher rate. Nonetheless, the top water-use lists illustrate that for the ultra-wealthy, a costly water bill doesn't necessarily incentivize behavior change.

Laura Martin, executive director of the Progressive Leadership Alliance of Nevada, laments that Southern Nevada, with its emphasis on tourism and leisure and reputation for excess, seems to lack a "culture" of water conservation.

"It was a little shocking to move here and see pools and sprinklers and water being wasted," Martin said.

The valley's strides in water conservation are nonetheless remarkable. Total water consumption has gone down from 261,000 acre-feet in 2008 to 243,000 acre-feet in 2018. Annual water use per capita has also dropped from 144 gallons to 124 gallons between 2008 and 2018, Mack said.

"The water authority has done a very, very effective job as it relates to their water smart landscape rebate program, but they can't force people to do it," said Kyle Roerink, executive director of the Great Basin Water Network.

But that doesn't change the fact that Nevada is the driest state in the country. Despite gains this winter due to heavy snowfall, Lake Mead water levels have been dropping since at least 1999.

"It's going to be incumbent upon individuals to realize that they live in the desert and that there isn't an infinite supply of water for them to use wantonly," Roerink said.

Chemicals in tap water could cause 100,000 cases of cancer in U.S.

BY KATE GIBSON

SEPTEMBER 19, 2019 / 5:16 PM / MONEYWATCH

- A "toxic cocktail" of chemicals in the country's drinking water could result in 100,000 cancer cases, a new study finds.
- The chemicals are byproducts of those used to disinfect water and naturally occurring arsenic, as well as radioactive chemicals.
- Consumers should buy water filters to use at their homes, the nonprofit behind the study recommends.

Chemicals in the nation's drinking water could result in 100,000 cases of cancer in the U.S. over a lifetime, according to a study released Thursday by the Environmental Working Group. The findings may bolster the argument for investing in protections for U.S. source water, as well as for consumers to use water filters at home, the nonprofit environmental advocacy group said.

The vast majority, or 87%, of the more than 100,000 estimated cancer cases linked to drinking tap water are due to byproducts of chemicals used to disinfect water and naturally occurring arsenic, according to the findings, published in the peer-reviewed journal Heylion. The remaining cancer cases were attributed to radioactive chemicals in drinking water.

Water filters recommended by the Environmental Working Group range from relatively inexpensive filters like Brita pour-through filters that can cost as a little as $16 to more expensive gadgets that can screen out specific contaminants like arsenic, but which can set you back by as much as $5,000.

Americans spend billions fighting cancer, whether on researching a cure or on treating a disease that kills more than 600,000 annually. The cost of treating cancer in the U.S. came to $80.2 billion in 2015, according to the American Cancer Society, which cited estimates from the Agency for Healthcare Research and Quality.

At least 42% of newly diagnosed cancers in the U.S. — about 740,000 cases in 2019 — are potentially avoidable, according to a recent study by the American Cancer Society.

Billed as the first study to examine the cumulative cancer risks stemming from 22 carcinogenic contaminants found in the nation's drinking water, the analysis is based on water-quality profiles for more than 48,000 community water systems across the U.S.

Drinking water in 48,000 communities

"Drinking water contains complex mixtures of contaminants, yet government agencies currently assess the health hazards of tap water pollutants one by one," Sydney Evans, lead author of the paper and a science analyst at EWG, said in a statement. "In the real world, people are exposed to combinations of chemicals, so it is important that we start to assess health impacts by looking at the combined effects of multiple pollutants."

Most of the systems examined by the researchers were not violating any health laws, the researchers said. By comparison, water crises in cities such as Newark, New Jersey, and Flint, Michigan, have been caused by a complicated mix of mismanagement, old lead pipes and a lack of investment.

"It is important to highlight that the vast majority of the community water systems analyzed in this study were in compliance with U.S. national drinking water standards," the study's authors noted.

Check your local water report

The researchers advise that individuals take a look at water reports from their own locality and pick an appropriate filter, something that can be done with help from a database and guide at the EWG.

On a broader scale, the findings highlight that "investing in measures for source water protections" would serve to protect public health and reduce health issues due to environmental pollution, Evans and the study's other authors wrote.

"We don't want to discourage people from drinking the water they need, and we don't want people switching to bottled water either, as in most cases it's not the answer," Evans told CBS MoneyWatch. "It's incredibly expensive compared to tap water and there's no guarantee that it's any less contaminated."

EWG advocates for buffers and cover crops to keep industrial runoff and farm fertilizer and manure from getting into water systems, as opposed to addressing the added waste at water treatment plants.

> "Preventing it from getting in there is a lot better and a lot cheaper" than treating it after the fact, Evans said.

First published on September 19, 2019 / 5:16 PM

Truckee River reconstruction

By Terri Russell |
Posted: Mon 6:12 PM, Sep 23, 2019

RENO, NV (KOLO) “The main question we have been getting is from people walking down the street asking what we are doing in the river--I've been asked if this is a water park and our response has been that it is to help recreational users of the river,” says Ryan Dixon the Truckee Meadows Water Authority Construction Engineer.

The construction in the river bed of the Truckee River has been going on since mid-August.

The water has been halted above the Glendale Bridge, and then re-routed to the east side of the river.

Sandbags help ease the flow of the Truckee, there's a ten foot drop from here to the bridge.

To ease that drop for fish and kayakers alike...a Weir has been installed.

It looks like a series of steps.

In fact, rocks have been strategically placed horizontally from the sandbags to the bridge.

Not just any rocks, each weighs more than 10,000 pounds and is more than four feet in diameter.

Repairs to the intake structure along the river are part of phase two of the project.

“It is a state of the art facility it involves filtration disinfection and other products to make it safe potable water for our customers,” says Dixon.

All of this is due to the flood of 2000-17 which damaged the intake structure and the river design.

A look on the other side of the bridge and the river looks like it has not been disturbed.

Phase one of this project is nearly complete.

Dixon says he hopes to have construction workers out of the water by October 1st.

Housing: Reno City Council approves Daybreak project, avoids court battle

Jason Hidalgo, Reno Gazette JournalPublished 4:08 p.m. PT Sept. 23, 2019 | Updated 5:17 p.m. PT Sept. 23, 2019

The Reno City Council approved modifications to the controversial Daybreak housing project in southeast Reno on Monday, avoiding a potentially costly legal battle but also raising questions about the precedent it sets for projects that are rejected in the future.

Council members voted 4-3 to approve the project as part of a court-approved remand negotiated by both parties. The vote tally mirrored the Sept. 11 council vote, with Mayor Hillary Schieve and Councilwomen Naomi Duerr and Jenny Brekhus voting against the Daybreak project.

The vote was welcomed by Daybreak developer Newport Pacific Land.

“I think the Reno City Council made a very wise and well-informed decision today,” said Newport’s Executive Vice President Chris Bley. “I couldn’t be happier with the outcome.”

A 4-3 vote

Council members voted on the project as part of a court-approved remand negotiated by both parties. The remand allowed Newport to present its modified project once again to the city of Reno without having to reapply. The city of Reno rejected Daybreak’s application for a 4,700-unit development at the former Butler Ranch site on Nov. 28. Monday's vote approves a 3,995-unit development instead.

Renderings of the proposed 4,700-unit Daybreak project in southeast Reno's former Butler ranch site. This shows the Echo Valley center at sunset. *(Photo: Newport Pacific Land)*

The rejection has since been followed by legal maneuverings between the Newport Beach, California-based developer and the city. Newport Pacific Land filed a lawsuit against the city on Feb. 15. The city of Reno responded with a motion to dismiss the case the following month. The first hearing on the city's motion was scheduled for Sept. 27 at Washoe County District Court.

Prior to the Monday vote, Newport offered several modifications to their original plan. These included a 25% increase in flood mitigation as well as a reduction in density to help address traffic concerns. Instead of 4,700 units as originally proposed, development was reduced by 15% to 3,995 units. To address concerns about mercury contamination, Newport says it will excavate two feet of soil in problem areas, which will then be buried under two feet of clean soil. No homes will be built in such areas.

Safety vs. NIMBY debate

Despite the modifications proposed, public comment continued to be overwhelmingly against the Daybreak project. Of the 318 letters and comments submitted, 226 were against the project while 87 were in favor. The remaining five did not state a position but expressed concern about Daybreak.

Supporters of the project claimed that critics don't speak for the entire community.

"While there's a loud NIMBY voice and they can control certain sections of social media, I don't think that they're representative of the 298,000 residents (of the Reno area)," said Don Tatro, CEO of the Builders Association of Northern Nevada.

Critics argued that there are legitimate concerns behind their opposition to the project. Reno resident Kent Cheatham, who lives in a neighborhood close to the proposed Daybreak site, wondered what would happen to the water diverted from the former Butler Ranch location when it floods.

Cows wander the Butler Ranch across the canal from the Heron's Landing development on Wednesday, Nov. 1, 2006. Floodwaters from the New Year's Eve flood from last year filled the area, leaving only the tops of the fence posts showing. *(Photo: David B. Parker/RGJ File)*

“They’re going to push that my way,” Cheatham said. “(Flooding) will come, you know it does every seven to 15 years.”

'I don’t want to put people in harm’s way'

Newport’s Bley says he knows that flooding is scary and that he understands the concerns expressed by residents about it. Bley said his company is sensitive to the concerns of residents who live near the planned community.

“I don’t know how else I can ease their concerns except to say that we’re talking to experts and we’re doing everything in our power to make sure we’re leaving the land in a better place,” Bley said.

Duerr, who voted against the project, shared the concerns mentioned about flooding. Duerr asked what would happen should a nearby dam that is used to store effluent suffer a catastrophic failure. Project Planner Andrew Durling of Wood Rogers responded that they are aware of that particular dam.

“All dams need to have an (emergency action plan); by no means does it prohibit development below the dam,” Durling said. “It is a high hazard dam … so the burden of maintaining it goes to the dam owner, Washoe County.”

Duerr expressed concern that the developer was only ensuring the safety of Daybreak's residents but not the safety of those living around the project site. She then noted how a canal broke in Fernley in 2007. The incident flooded about 580 homes, according to Duerr.

“I don’t want to put people in harm’s way,” Duerr said.

'This isn't easy'

Councilman Oscar Delgado, who represents the district where Daybreak will be located, pushed back against Duerr’s repeated comments about putting people in harm's way and how it could be interpreted. Delgado previously voted against the Daybreak project last year before voting yes to approve the modified plans on Monday.

“(The safety of my constituents) is always a big part of why I’m even here,” Delgado said.

“It may not be a popular vote, it’s going to be a tough vote to go out and continue to talk to my constituents about what this was and what it wasn’t. This isn’t easy.”

Duerr responded that it was not her intent to make it seem like council members who voted for the project are not thinking about their constituents’ safety.

The approval of the Daybreak plan effectively puts the legal battle between the developer and the city to rest. Even with the reduction of planned housing from 4,700 units down to 3,995, Bley says he's satisfied with the end result.

"It is what it is," Bley said. "Development is about give-and-take and I'm totally happy with where we ended up."

Jason Hidalgo covers business and technology for the Reno Gazette Journal, and also reviews video games as part of his Technobubble features. Follow him on Twitter

Reno Fire Department responds to 4 fires along the Truckee River, 3 suspected as arson

Sam Gross, Reno Gazette JournalPublished 8:28 a.m. PT Sept. 25, 20

Reno Fire Department@RenoFireDept

Reno firefighters extinguish a fire near the Truckee River on Tuesday, Sept 24. *(Photo: Reno Fire Department)*

The Reno Fire Department says it responded to four fires Tuesday night, with three of those fires — all along the Truckee River — believed to be arson.

Another fire was at a homeless camp located far from a municipal water supply, forcing firefighters to use wildland firefighting techniques to pull water from the Truckee River, according to a tweet from the fire department.

7:40 AM - Sep 25, 2019 · Reno, NV

RFD responded to 4 fires last night. 3 are suspected arson along the Truckee River and another was at a homeless camp far from a municipal water supply. @RenoFireDept personnel used wildland fire fighting techniques to secure a water supply from the Truckee River.#Ingenuity

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Sam Gross is a breaking news reporter for the Reno Gazette Journal who covers wildfires, emergencies and more. Support his work by subscribing to RGJ.com right here.

How Does Climate Change Affect Mountainous Watersheds That Give Us Our Water?

DOE watershed project expert spells out impacts in new IPCC report

Feature Story By Christina Procopiou • September 30, 2019

Research by the DOE Watershed Function SFA project team takes place year-round in a research area along the East River catchment near the Upper Colorado River headwaters. One of the busiest times for sampling is during peak snow. (Photo courtesy Watershed Function SFA)

The image of huge chunks of ice breaking away from glaciers and ice sheets, then floating out to sea in Earth's most remote places, may be the most iconic symbol of a warming planet. And while most people will never see these familiar phenomena up close, what's happening within some of the iciest settings still affects people and regions thousands of miles away.

Ecologist Heidi Steltzer, a Fort Lewis College professor and member of the Department of Energy's Watershed Function Scientific Focus Area (SFA) project led by Lawrence Berkeley National Laboratory, studies how reduced snowpack and earlier snowmelt caused by climate change impact water supply in high-mountain areas. She is a lead author of a new report by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change. The Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) assesses the latest scientific literature to describe the impacts of climate change on the ocean and cryosphere – water in its solid state, which in mountains includes glaciers, permafrost, and snow.

Steltzer drew upon experience working in the Rocky Mountains of Colorado near the headwaters of the Colorado River in co-authoring the report's chapter on high mountains. This marks the first time since 1996 that the IPCC has featured a chapter on mountains within one of its reports.

"Mountain systems provide water to people – water that is essential for drinking, growing food, industry, and energy systems. Available water depends not just on how big a glacier is or how much snow falls or how fast melting happens, but also on how the ice and snow affect plants, microbes, and soils," said Steltzer.

Ecologist Heidi Steltzer evaluates the site of a 2018 wildfire within 10 miles of her Colorado home. Changes in snow affect the disturbance regime of U.S. mountain regions. (Credit: Joel Dyar)

The power to move mountains

The IPCC invites select scientific experts to evaluate thousands of scientific papers published each year in order to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. Authors of the content on mountainous regions scoured the scientific literature for articles covering all high-mountain regions where the cryosphere is present year round or seasonally.

The SROCC adds to knowledge of glacier mass loss, thawing permafrost, and decreasing snow cover and snow duration, which affect mountain ecosystems, water supply, disturbances, and hazards. Authors of the chapter on high mountains assert that multiple hazards and risks stem from changes in the mountain environment, including impacts of variability and trends in water supply on hydropower production and implications for energy policy and water governance.

The report describes a lengthening of the growing season and more plant growth in some regions, such as the Qinghai-Tibet Plateau, due to shorter duration of snow cover. Yet, in other regions, such as the U.S. Rocky Mountains where Steltzer and the Berkeley Lab Watershed Function team are working, plants aren't growing more even though the growing season is longer.

Susan Hubbard is lead of the DOE Watershed Function SFA project and Associate Laboratory Director for the Earth & Environmental Sciences Area at Berkeley Lab. According to Hubbard, "The multidisciplinary approach of the Watershed Function SFA aims to understand how disturbances such as earlier snowmelt influence interactions between bedrock, soil, microbes, and vegetation across changes in elevation and gradients and how this in turn affects downstream water supply and water quality."

"Heidi's expertise in mountain ecology is invaluable to this project, as is her understanding about how different mountainous watersheds across the world are responding to changing conditions."

Recent SFA findings will help fill gaps identified in the SROCC report and serve as a resource for future IPCC reports. For example, the report explores the huge change in the amount of snowfall from year to year over the past three years across Colorado and many regions of the Western U.S. Also, during low-snow, early melt years, plant growth is increasingly synchronized across different elevations. Under climate change, the timing of plant growth is changing, which will affect water availability and nutrient retention and loss through plant interactions with microbes.

Filling the gaps

According to Eoin Brodie, Deputy Director of Climate and Ecosystem Sciences at Berkeley Lab and Watershed Function SFA project member, "The timing of snowfall and rate of snowmelt control microbial processes that appear to exert a significant control on nitrogen export from hillslopes to the river."

Together, Steltzer, Brodie, and SFA team members are using field data to inform computer model development and models to inform understanding of future watershed behavior. In doing so, they are building a system for predicting water supply in the Western U.S. that includes how declining snow cover affects these plant and microbial dynamics.

The mountains are calling

Now fall has arrived in the mountains of Colorado, and SFA researchers are just completing sampling after a high snow year, one in which there was abundant water until the monsoon rains failed to show.

"The increasing inconsistency of mountain snow and rain is shocking," said Steltzer. "These conditions let us study how both abrupt and gradual changes in snow dynamics impact water availability and water quality, which are critical for downstream industry, people and the economies of communities in mountain regions and beyond."

A takeaway for Steltzer from her work on the report is to question why mountains don't receive more attention. She thinks that for the vast majority of people around the world – who don't live near mountains – it can be hard to feel connected to the mountains in any meaningful way.

"While the mountain cryosphere is critical for providing billions of people with water – more people than we likely realize or can characterize with data – its significance still can go largely unnoticed," Steltzer says.

"We pay attention to the changes near us more than those taking place far away. This report is an opportunity to learn about these distant changes in the Earth's mountain and polar regions. Scientists are monitoring them, charting rates of change to come, and sharing what they are witnessing on mountain tops and polar lands and seas. Changes in these remote regions affect us all."

# # #

Founded in 1931 on the belief that the biggest scientific challenges are best addressed by teams, Lawrence Berkeley National Laboratory and its scientists have been recognized with 13 Nobel Prizes. Today, Berkeley Lab researchers develop sustainable energy and environmental solutions, create useful new materials, advance the frontiers of computing, and probe the mysteries of life, matter, and the universe. Scientists from around the world rely on the Lab's facilities for their own discovery science. Berkeley Lab is a multiprogram national laboratory, managed by the University of California for the U.S. Department of Energy's Office of Science.

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TAGS: climate, Earth sciences, environment

SCIENCE SNAPSHOTS

WILDFIRES

Paradise Residents Still Can't Drink the Water

LISTEN

3 min

Molly Peterson
Sep 30

Public health investigator Dr. Gina Solomon examines a water meter in Paradise. Her team will do the first testing for the carcinogen benzene inside homes left standing by the Camp Fire. *(Molly Peterson/KQED)*

Since last November, when the Camp Fire almost completely destroyed the town of Paradise, the cancer-causing chemical benzene has tainted the town's water, leaving it undrinkable. Now an independent team of scientists will begin testing for the carcinogen and other pollutants inside the houses that the fire left standing.

Ten months after the Camp Fire, the Paradise Irrigation District still warns residents not to use its water for brushing teeth, making ice, cooking and drinking.

"The main goal is to really understand what's going on, basically, and to address any issues that come up," environmental health investigator Dr. Gina Solomon told residents at a recent Paradise Irrigation District meeting.

Ten months after the Camp Fire, the irrigation district still warns residents not to use its water for brushing teeth, making ice, cooking and drinking.

Some residents have purchased tanks at a cost of thousands of dollars, filling them regularly for hundreds more. Others rely on bottled water that the district provides daily at a parking lot. A small number of people are back at their properties with an all-clear; a larger number are waiting.

Exceeding Safe Limits

Where fire didn't destroy water systems, it has left the risk of contamination, though the extent of that risk is still unclear.

Some residents have not yet returned to their homes. Unless they've done their own testing, they likely don't know whether benzene reached their taps; local water suppliers aren't responsible for water quality problems in private homes. Even the testing that suppliers have done hasn't followed a consistent standard, and it still isn't complete.

Experts at the water districts and beyond say discerning a pattern in the contamination is difficult because the burn was so severe and widespread.

Paradise Irrigation District has sampled water at more than 2,700 sites, including both the water mains and the service laterals -- the pipes that connect the mains to the meters at individual properties. In those pipes that connect to burned lots, tests have found benzene tainting the water 30% of the time, as opposed to just 13% in service lines connected to homes that were left standing.

In neighboring Magalia, a private water provider, the Del Oro Water Company, tested for and found benzene in five of its service lines. Del Oro subsequently flushed its pipes, and tests have come back clear.

The state sets a benzene limit in water of one part per billion, roughly equivalent to a single drop in someone's swimming pool. The state's standard is based on the assumption that a person might drink 2 liters of water a day for a lifetime. The federal standard is slightly higher, at 5 parts per billion.

Limited testing in Butte County has found some sites significantly higher than those numbers. State and local officials stress that most positive hits for benzene have averaged around 20 parts per billion. But at one property in Paradise, testing found a benzene level of 923 parts per billion; in Del Oro, there was one found at 530 parts per billion.

Solomon says benzene contamination following a fire is an emerging and complex threat. What's happening in Paradise has only been reported once before, after the North Bay fires.

After fire burned Santa Rosa's Fountaingrove neighborhood two years ago, tests found benzene in the area's water main, in service components, and in service lines. At the time, local officials attributed the problem to melting plastic pipes, and to system depressurization that might have helped the contamination spread.

But the systems that burned in the Camp Fire have been found to contain benzene-tainted water in both metal and plastic pipes.

As climate change exacerbates wildfires, it also puts stress on infrastructure. "We are learning with everybody here how to recover a water system from a devastating fire," says the Paradise Irrigation District's Kevin Phillips.

"There's this question about what's happening between the service line and the tap," says Solomon, a clinical professor at UC San Francisco and principal investigator at the Public Health Institute.

It's a question her team hopes to help answer.

Where's It Coming From?

On a recent weekday, Solomon poked at water meters in locations where the Paradise Irrigation District found benzene.

UCSF and Public Health Institute researcher Dr. Gina Solomon and the State Water Resources Control Board's Yvonne Heaney examined water meters and water pipes in Paradise. *(Molly Peterson/KQED)*

The Camp Fire burned away 90 percent of structures in town. The few houses left look like jack-o-lantern teeth sticking up between the gaps, made up of empty streets. At every lot, burned or not, the skeleton of a water system remains.

"That is melted," Solomon confirmed, tapping a meter with a stick.

Solomon's team, including researchers from UC San Francisco and Oakland's Public Health Institute, plans to test for benzene at the kitchen sinks of 175 homes in burned areas.

At a public meeting, Solomon said the team wants to identify how far the toxic chemical has spread into standing homes.

"We're also interested in any clues as to where that benzene might be coming from," she said. "There are theories, but there's not really a clear scientifically supported reason that we're quite confident of yet."

The team will begin testing next month and hopes to have the first round of results made public by Thanksgiving. Solomon says if they find benzene in homes during this first phase, the team will go back for more detailed and broader testing.

Clearing the System -- Slowly

Paradise Irrigation District says that 70 percent of mains and hundreds of service connections are clear. Speaking at a public meeting, a consultant to the irrigation district, Sami Kader, said that getting an individual home cleared is “tortuous.”

“Before we can send someone a letter, we have to be confident that everything that connects that person to the water treatment plant has been tested and cleared,” Kader said.

Water districts are cautious by design, and officials in Paradise say the long-term plan is to replace all of the service laterals. In the near- term, work will focus on connections to burned lots, where tests have found contamination more often.

Phillips, the water chief in Paradise, says the city will need money to replace its systems. The town is seeking help from federal authorities; it’s not yet clear how much of the cost the Federal Emergency Management Agency will pick up.

At September’s public meeting, Phillips expressed thanks to residents for their patience as his district works to return the water system to functionality.

“We know we are behind,” he says.

Tips on how to prepare for freezing temperatures

by Dwayne Macie
Tuesday, October 1st 2019

Link to video

RENO, Nev. (News 4-Fox 11) — An early season winter storm has brought very cold temperatures to the Reno-Tahoe area.

Overnight temperatures are forecast to dip several degrees below freezing Monday night and even some teens around the region especially up around the lake. Residents are advised to ensure those outdoor pipes and faucets protected is the number one priority.

Laine Chistman from the Truckee Meadows Water Authority says, “the biggest thing you want to think about right now is to disconnect your hoses and drain them. Take them inside to avoid any sort of freezing. Protect any exposed pipes by covering them with some insolation or something to prevent them from freezing.”

Ensuring your pets are safe and warm should also be a priority. If your pets are normally outdoors, make sure they have a warmer place to be such as a garage.

You should also be aware of the plants you bring into your home. Some may not be safe for pets.

Volunteers Remove Trash Along Truckee River

October 3, 2019 By Kayla Anderson Leave a Comment

John Byrne/Tribune

Sparks City Councilman Donald Abbott was one of many volunteers that helped clear trash from 22 sites along the Truckee River over the weekend.

Although the weather was a bit sketchy last weekend, that didn't prevent 750 volunteers in Washoe County from visiting 22 sites along the Truckee River to remove 77,853 lbs. of green waste, stencil in storm drains, pull invasive weeds, and remove 20,510 pounds of trash. More than 2,600 bulbs were also planted to help regenerate and restore the habitat around the river and in Washoe County parks.

"We had around the same number of volunteers plus/minus 10-15 people as last year which was good in regard to the threat of the weather," says KTMB Program Manager Lorian McConnell. At the after-cleanup picnic held on September 28 at Rancho San Rafael Regional Park, people were raving about how nice the weather was for the event right before the storm blew in.

In the City of Sparks, volunteers gathered at Cottonwood Park, Glendale Park, and Rock Park to help clean and restore some of the community's natural landscapes. Forty-two volunteers gathered at Cottonwood Park to get rid of more than 1,200 lbs. of green waste and 320 lbs. of trash, which included removing suckers from trees and pulling weeds. Fifty-eight volunteers showed up at Glendale Park and hauled out 7,000 lbs. of trash and green waste while 50 volunteers at Rock Park spread pine mulch and wood chips to help mitigate weeds and insulate the trees.

"It is a big effort- it takes quite a bit of people to spread all that pine mulch and it requires some heavy lifting," McConnell says. Two hundred pounds of trash and 1,500 lbs. of green waste was removed at Rock Park.

Not only were volunteers on land out in full force last weekend, fly fishers and the Sparks Water Entry Team were out in the water pulling out 500 pounds of debris, which mainly consisted of clothing and candy wrappers.

"Even with wind and cold, we had an amazing turnout of community support to clean and protect the Truckee River and its watershed," said Christi Cakiroglu, KTMB's Executive Director. "We're so grateful to our many partners that make this cleanup happen, including our funders at the Washoe County Health District, Truckee River Fund, UPS, and REI. We're especially grateful to all the hundreds of volunteers who came out to give their time and make today's event such a success."

McConnell says that in general, weeds and trash are the biggest threats to the Truckee River environment and that everyone can always do their part by picking up waste that they find while walking on trails or along the river.

"The biggest thing you can do for the parks is to volunteer with the City of Sparks or KTMB on these cleanups," McConnell adds. And while a fair amount of illegal dumping is still going on, fortunately the Washoe County Sheriff's Office has been catching a lot of people. Anyone who sees people physically dumping trash can always call the Washoe County Sheriff's Office Dispatch at 775-785-WCSO or 775-329-DUMP to report illegally dumped material. To help mitigate illegal dumping, KTMB also provides a recycling guide on its website at https://ktmb.org/.

The next KTMB community cleanup is May 2, 2020 where KTMB will focus on locations that are not necessarily along the Truckee River. Anyone is welcome to volunteer.

Making California's Water Supply Resilient

In this Q&A, two Stanford University researchers discuss how a diversified water portfolio can meet the water needs of California heading into an uncertain future.

As with the stock market, climate change requires a diversified portfolio of solutions.

California Gov. Gavin Newsom recently signed an executive order to develop a comprehensive strategy for making the state's water system climate-resilient. The order calls for a broad portfolio of collaborative strategies to deal with outdated water infrastructure, unsafe drinking water, flood risks and depleted groundwater aquifers.

In a related study published earlier this year, Stanford researchers Newsha Ajami and Patricia (Gonzales) Whitby examined effective strategies to rising water scarcity concerns. Ajami is director of Urban Water Policy at Stanford's Water in the West program and a hydrologist specializing in sustainable water resource management. Whitby is a recent Ph.D. graduate from Stanford's civil and environmental engineering department and currently a water engineer at environmental consulting firm Brown and Caldwell.

Below, they discuss their research and how a diversified water portfolio can meet the water needs of California into the future.

How does a diversified water portfolio reduce risks associated with water supply?

Ajami: Developing a water supply portfolio means moving away from dependence on one water source such as imported water or groundwater in order to develop a number of other water sources by incorporating local and regional solutions including conservation and efficiency, water recycling and reuse, rainwater and stormwater harvesting and desalination.

The golden rule in an investment portfolio is to have diversification which prevents short-term and long-term risks. The same rule applies to a diversified water portfolio. In order to minimize the risk of short-term and long-term challenges and disruptions due to failing infrastructure or climate change impacts including intensified droughts and floods, it is important to rely on more than one supply source and develop a water portfolio that is comprised of multiple water options in order to increase systematic flexibility and resiliency.

In developing such a portfolio, utilities and regions should not only focus on the number of sources but also need to think about the capacity of each supply. Our team has developed a water reliance index which can help measure these goals at both the utility and regional level.

Whitby: A water supply portfolio is the combination of water supply sources available to a utility. Diversifying means we're not putting all of our eggs in one basket, so if something happens to one of the supplies like a disruption to the physical infrastructure or a water quality concern or a cutback due to drought, we still have a portfolio of other options available. Water supply diversification should pursue different types of water sources such that each supply has different risks and also different strengths. For example, water reuse is typically considered a robust supply that is resilient to drought. Similarly, diversification means not only having many different water sources available, but also leveraging those sources to reduce stress on the more traditional supplies.

What key priorities would you expect California's water resilience portfolio to focus on?

Related: EPA Announces Funding for Water Reuse and Conservation Research

Ajami: A water resilience portfolio can look different from region to region as California faces different challenges, opportunities, risks and limitations across the state. It is important for regions to identify the value and risks of existing and potential water supply options and focus on projects that not only enhance access to clean water but also deliver broader environmental and societal benefits such as green infrastructure.

In highly urbanized regions, solutions such as on-site reuse work well, while communities with lower densities may find a centralized recycling plant as a better solution. The state needs to recognize these parameters and provide regions with broad guidelines while enabling and encouraging development of collaborative regional strategies. A model similar to the Renewable Energy Portfolio comes to mind, where regional and a statewide water diversification portfolio goals are set and then incentivized. In a recent study our team developed a cap and goal-based trading model that enables a region to reach their water diversification portfolio goals by working together and taking advantage of regional opportunities to develop a diverse set of water solutions. Such innovative system level solutions can help water utilities coordinate their efforts, overcome fragmentation and share both financial and water resources while also gradually adjusting their business model.

What role does climate change play in future planning?

Ajami: Climate change is magnifying many of our current water challenges. Intensified droughts and floods are demonstrating the limitations of our traditional infrastructure model such as dams and wastewater treatment plants. The shift in our hydrological cycle means the conventional ways we managed our complex water systems aren't working.

The new normal looks very different, as precipitation patterns have shifted, and we are receiving more rain than snow. Also due to higher temperatures, snow melts earlier and faster than before, depriving us from our natural reservoir that used to hold much of our summer supply. Sea level rise is threatening our coastal groundwater basins and wastewater treatment plants. Increased wildfires especially in urban/wildland interface is affecting water quality.

Overall climate change is interrupting our water systems. This means climate change has to be front and center in every infrastructure planning process. Our 21st century infrastructure model should look very different from our 20th century model, incorporating more nature-based solutions that can increase our system's resiliency and flexibility.

Related: Could California Run Out of Water?

Can this order also help fix California's outdated drinking water infrastructure?

Ajami: Absolutely! Replacing and fixing our aging infrastructure requires a holistic approach and it should also include changing and revamping our funding and financial model. If you look at your energy or telephone bill, there is a line item that provides funding to ensure access to telecommunication and energy infrastructure for rural and low-income communities. This model provides long-term sustainable and stable funding that is essential. This is exactly what we need in the water sector and what we do not have.

Gov. Newsom has certainly identified access to clean water as one of his administrations major issues. His team has certainly tried to find resources to make it happen – which is a great first step – but I believe a model similar to energy and telecommunications sectors are needed to guarantee long-term sustainable and resilient solutions for every community in California.

Whitby: Definitely. Aging infrastructure is one of the risk factors affecting our water systems today. A fair amount of water is lost to system leaks before it even reaches customers. Incentives to diversify and strengthen our water portfolios provide an opportunity to not only retrofit and expand infrastructure, but also to re-invent and fortify our water system for the next century.

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We pump too much water out of the ground—and that's killing our rivers

By 2050, thousands of rivers and streams worldwide could pass a critical ecological threshold, new research shows.

Photograph by Will Seberger/ZUMA PRESS, Inc/Alamy

BY ALEJANDRA BORUNDA PUBLISHED OCTOBER 2, 2019

There's more fresh water hidden below Earth's surface in underground aquifers than any other source besides the ice sheets. That groundwater plays a critical role for rivers worldwide, from the San Pedro to the Ganges, keeping them running even when droughts bring their waters low.

But in recent decades humans have pumped trillions of gallons out of those underground reservoirs. The result, says research published Wednesday in *Nature*, is a "slow desiccation" of thousands of river ecosystems worldwide. Already, somewhere between 15 and 21 percent of watersheds that experience groundwater extraction have slipped past a critical ecological threshold, the percent.

That means hundreds of rivers and streams around the world would become so water-stressed that their flora and fauna would hit a danger point, says Inge de Graaf, the lead author of the study and a hydrologist at the University of Freiburg.

"We can really consider this ecological effect like a ticking time bomb," she says. "If we pump the groundwater now, we don't see the impacts until like 10 years further or even longer. So what we do right now will impact our environment for many years to come."

Groundwater holds up modern life

The last undammed river in the U.S. Southwest, the San Pedro of southwestern Arizona, used to gush and roil. Birds chirped and splashed on its banks when they stopped by on their migrations. Rare fish swam in its pools.

But in the 1940s, wells started to pop up in the nearby area, sucking clean, cool water out of the region's underground aquifers.

It turned out that a good portion of the water that flowed through the river came not from rain and upstream snowmelt, but from those underground sources. The more water that got pumped out of the aquifers, the less flowed into the river—and the wetlands, cottonwood stands, fauna, and rushing waters of the San Pedro all suffered.

(Read about the vanishing Ogallala aquifer, one of the most important water sources in the western U.S.)

Groundwater is the hidden scaffold propping up much of modern life. Globally, about 40 percent of the food we grow is watered with liquid extracted from below Earth's surface.

But many of the aquifers from which this water is extracted took hundreds, or even tens of thousands of years to fill: The water inside may have percolated through cracks in the earth when giant ice sheets last covered New York City 20 thousand years ago.

Much of that water is being removed much faster than it can be replenished. That has enormous potential consequences for people who want to drink water grow and crops in areas that don't get enough rain. But far before those impacts emerge, the effects will—and in fact already have—hit rivers, streams, and the habitats around them.

"Think of an aquifer like a bathtub full of water and sand," explains Eloise Kendy, a freshwater scientist at the Nature Conservancy. Then, imagine running your finger lightly through the top of the sand, creating a little trail.

That little trail fills up with water that percolates through the sand into the "stream."

"If you pump out just a little bit of water out of the bathtub, that stream is going to dry out, even though there's plenty of water still left in the bathtub," she says. "But as far as healthy rivers go, you've destroyed it. But because rivers don't scream and shout, we don't necessarily know that they're in trouble."

(Read about how two-thirds of the world's longest rivers don't flow freely anymore).

Water is life, until it's gone

In the new research, the team took a global look at where groundwater is already being extracted at such a rate that it has caused water levels to drop so much in rivers and streams that they cross a critical environmental threshold: when water levels drop to less than 90 percent of the average flow during the dry season, the time when groundwater matters the most to river flow. Passing that threshold for more than three months of the year, for at least two years in a row, endangers the flora and fauna of freshwater systems, says Brian Richter, a water expert and scientist at Sustainable Waters.

"There can be just a very small depletion of water at those sensitive times, but ecologically it's meaningful," he says.

Freshwater species, like ones that depend on healthy rivers and streams, are some of the most endangered in the world.

In the new analysis, de Graaf and her colleagues found that 15 to 21 percent of watersheds that pump groundwater are already past this threshold (about half of all watersheds worldwide are pumped). As climate change exacerbates droughts in many parts of the world, the stresses on groundwater—and by extension, on rivers and streams—is likely to get much, much worse, they say.

Their predictions might be conservative. As a baseline, they used the global water demand in 2010 and spun their climate model forward to see how stresses on groundwater systems might develop. But as populations swell and the demand for food rises, those stresses could increase for reasons other than climate change, speeding along the extraction from underground water sources.

But the effects of overpumping groundwater take years, if not decades, to become visible. Changes in rain have immediate, obvious effects on river flow, explains Gretchen Miller, a hydrologist and engineer at Texas A&M University: When it pours, rivers often rage. But groundwater is hidden: changes take much longer to come to light, and don't always manifest in the place where the pumping occurs. That makes aquifer management issues extra challenging, and only a small fraction of watersheds have plans in place to address the looming problems.

In the meantime, rivers and streams are the "canary in the coal mine," says Richter. "They're the signal that says we're using water in an unsustainable fashion, we need to take a hard look at what we're doing."

New Director of City's Water Department Talks About Conversion To Smart Water Meters

The City of San Diego is ready to move forward with smart water meters amid major cost overruns and staffing shortages

By Consumer Bob, Dorian Hargrove and Tom Jones

Published Oct 2, 2019 at 8:44 PM

Delays, cost overruns and mismanagement have defined the City of San Diego's nearly decade-long quest to convert to wireless digital water meters.

On Wednesday, directors for San Diego's Public Utilities Department appeared before the city's Audit Committee to provide an update on the $76 million conversion from manual direct-read water meters to wireless. The July 2019 audit blamed the water department for cost overruns, delays, and staffing shortages during the conversion to smart water meters.

The conversion, originally budgeted at $60 million, has ballooned since 2012 when the city council first allocated $5.1 million to the project. The city to date has spent more than $20 million, a third of the initial budget. However only 10 percent of all households currently have working smart water meters citywide.

NBC 7 Responds has reported on the conversion and billing complaints for nearly two years. During that time our investigation found that cost overruns were not the department's only issue.

The investigation revealed water department managers failed to disclose manufacturing defects in some smart water meters that caused errors. We found thousands of water customers who received inaccurate bills, forcing the city to eventually issue more than $1 million in customer refunds in 2018 alone.

A previous city audit also discovered instances where water department supervisors allowed staff to override quality controls when reading customer meters leading to additional billing problems.

All of the issues eventually led to numerous internal investigations, ending with a reorganization of the city's troubled department.

But on Wednesday, the new chief of the city's water department looked to put a new face on the culture inside the department as well as a fresh spin on the problematic conversion to smart water meters.

"We are making sure that our expectations for everybody are clearly dictated," Shauna Lorance, the new director of the Public Utilities Department, told NBC 7 Responds after the audit hearing.

Lorance added that the department has improved since NBC 7 Responds' investigation began but they "can always do more."

As for the now $76 million plan to convert to wireless water meters, Lorance said they city will hire a third-party contractor to complete the project, which is expected to take another three to four years.

Previously, water department staff had installed the smart meters but the city auditor's review recommended finding an outside contractor to complete the job.

Once the city finds a third-party contractor to do the job, they estimate it will take another three to four years to convert all San Diego water meters to the new system.

"It's going to take a long time to regain confidence," said Councilmember Scott Sherman, who heads the Audit Committee. "But now I think we are moving in the right direction."

NBC 7 Responds documented its investigation in an Emmy-award winning 30-minute special titled Flood of Distrust: The Story of San Diego's Water Department. To watch the special, click here.

UV LED water disinfection: Validation and small system demonstration study

Natalie M. Hull

Abstract

Disinfection by ultraviolet (UV) light via non-mercury light-emitting diodes (LEDs) may be a sustainable solution for drinking water disinfection in small systems. The world's first commercial UVC LED water disinfection reactor (the PearlAqua by Aquisense) was studied over a year-long demonstration test, and performance was compared side by side with an existing chlorination system at a small water treatment plant in Colorado. The UVC LED disinfection system was validated using MS2 bacteriophage inactivation over a range of flow rates and water UV transmittances. The reactor was also challenge-tested with MS2 periodically during the year-long demonstration. During lab tests and the field study in challenging conditions without any maintenance, the reactor demonstrated viral and bacterial disinfection efficacy and resilience equivalent to the chlorination system, providing proof of concept for application of UVC LEDs for municipal water treatment.

Note; you have to have AWWA membership to see the report. Link:

https://awwa.onlinelibrary.wiley.com/doi/abs/10.1002/aws2.1148

5,000 Lahontan Cutthroat Trout to be Placed in Lake Tahoe

For the first time ever the U.S. Fish & Wildlife Service's Lahontan National Fish Hatchery Complex will stock several thousand large (12-14") Pilot Peak Lahontan cutthroat trout into their home waters of Lake Tahoe. The Lahontan cutthroat trout is the only trout native to the Lake Tahoe Basin. What was once a top predator in the area was thought to be extinct. Now, over the course of three days about 5,000 fishes will be placed in their home waters. The Department of...

Saturday, October 5th 2019, 7:31 PM PDT
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Saturday, October 5th 2019, 7:44 PM PDT

For the first time ever the U.S. Fish & Wildlife Service's Lahontan National Fish Hatchery Complex will stock several thousand large (12-14") Pilot Peak Lahontan cutthroat trout into their home waters of Lake Tahoe. The Lahontan cutthroat trout is the only trout native to the Lake Tahoe Basin. What was once a top predator in the area was thought to be extinct. Now, over the course of three days about 5,000 fish will be placed in Lake Tahoe.

The Department of Wildlife tagged the fish and will track their movement. Officials say stocking the fish will enhance fishing and angling opportunities in Lake Tahoe, and they say it's also good for the lake's ecosystem.

Lisa Heki, the project leader for Lahontan National Fish Hatchery Complex said, "It's an important component, the native ecosystem to restoring the health of Lake Tahoe and potentially clarity. When we're emphasizing native species in this Basin, it will be very important for the health and ecosystem in the long run."

The historic event is happening in conjunction with the Taylor Creek Visitor Center Fall Fish Festival. The hatchery will host two interpretive stocking events at the Fall Fish Festival, October 5 at 12 p.m. and October 6 at 12 p.m. There is no public viewing on Monday, October 7. The event takes place at Lake Tahoe Basin Management Unit's Taylor Creek Visitor Center and Kiva Beach, located on Highway 89, approximately three miles northwest of the City of South Lake Tahoe, Calif.

(U.S. Fish and Wildlife Service contributed to this report)

Wildfires Affect Water Resources Long After the Smoke Clears

Wildfires affect watersheds in myriad ways, from reducing evapotranspiration to changing soil repellencies, but new research suggests impacts on snowpack and runoff are the most significant.

The Woolsey Fire in Southern California left a scar on the landscape so large that it is easily visible from space. The effects of wildfires radically alter land cover and soil characteristics of the region, which in turn can affect the area's watershed. Credit: NASA

By Megan Sever 24 hours ago

The number of wildfires burning across the western United States over the past 6 decades has been steadily increasing, and those fires are growing larger and more severe, especially in mountain areas where more than 65% of clean water resources for the West's 75 million people originate. What happens when fires intersect water resources is the subject of two new papers in *Hydrological Processes*.

Large-Scale Modeling

The watersheds of the Sierra Nevada deliver water to more than 25 million people, primarily via snowmelt, and the conifers of the Sierra are where many of the most severe fires are burning.

As the trees burn, those land cover changes affect the hydrologic cycle. Previous studies involving experiments on changes in runoff and streamflow, evapotranspiration, soil moisture and infiltration, and snow dynamics have indicated that all of these factors would be somewhat affected after a fire. But until now, scientists haven't put it all together, said Fadji Zaouna Maina, a hydrologist at Lawrence Berkeley National Laboratory (LBNL) and lead author of one of the new papers.

Maina and her LBNL colleague Erica R. Siirila-Woodburn devised a large-scale modeling effort to understand how "postfire perturbations" affect hydrologic dynamics in the Cosumnes watershed, a vast and complex watershed that spans the Sierra Nevada and the Central Valley. The watershed includes 2,000 meters in elevation change from the headwaters to the valley, irrigated areas as well as forestland (more than half the watershed is conifer forests), and variegated geology, from low-permeability volcanic rocks to highly permeable sands and gravels in the valley. Most precipitation falls as snow. It's "highly representative" of most watersheds in California, Maina said.

Maina and Siirila-Woodburn ran simulations based on fires occurring in the upper mountainous part of the watershed, in the intermediate area of the watershed, or in the Central Valley downstream. They modeled hydrologic changes based on one of the driest years on record
(2015) and the wettest year on record (2017).

Land Cover Changes

Snow accumulations increase, and evapotranspiration decreases regardless of whether the fire is followed by a wet or dry year.Maina and Siirila-Woodburn found that land cover changes were the primary factor controlling hydrodynamics in the watershed.

It's counterintuitive, Maina said, but snow accumulations increase, and evapotranspiration decreases regardless of whether the fire is followed by a wet or dry year.

Whether there's a lot of precipitation or a little, snowpack is larger after a fire, which then means that runoff is larger, explained research hydrologist Dennis Hallema, who wasn't involved in either of the new studies. That's because as snow falls on an unburned tree canopy, the canopy intercepts much of the snow, which is then lost to sublimation rather than falling to the ground, melting, and recharging aquifers or running off into streams.

The research presents "an interesting pattern," Hallema said. Burned mountainous watersheds, which researchers found had the most impact, produce higher streamflows downstream than expected, even in a drought. However, he said, "the extra water that comes downstream after a fire is not necessarily beneficial for municipal water supplies because of water quality issues" such as higher phosphorus levels and more sediment.

Despite the increasing streamflows downstream, he added, "I would not recommend burning down your watershed to have a bit more water."

Soil Property Changes

In the other *Hydrological Processes* paper, Jingjing Chen of the Virginia Polytechnic Institute and State University and colleagues looked specifically at the issue of soil repellency and infiltration after fires. They compared soils in burned and unburned areas in Virginia and North Carolina and confirmed that water repellency is increased in soils after fires. The depth of the most water repellent soil varied across the sites. The factors of fire-induced soil water repellency include fire temperature, duration, and intensity; soil water content; and organic matter content and its composition derived from plants and microorganisms.

Chen said the factors of fire-induced soil water repellency include fire temperature, duration, and intensity; soil water content; and organic matter content and its composition derived from plants and microorganisms. Soil texture (including compaction), clay content, and even clay mineralogy all influence the soil water repellency degree, she said, and "the rainfall amount, frequency, and intensity may also influence the persistence of fire-induced soil water repellency."

"The effect of depth is interesting," Hallema said. But the fact that Chen and her colleagues found these changes were still significant more than a year after the fires lends credence to the idea that differences in water repellency might be more related to physical properties in the soils than the fires, Hallema said.

Chen, however, says that the findings indicate that hydrologic processes take longer to recover than previously thought. "If the fire-induced repellency disappears," she said, that would mean the hydrologic processes reverted to normal, which would have a positive influence on the recovery of plants and ecosystems.

It will be important to see, she added, whether soils in the West respond to fires like the soils her team studied—and that is their next step, along with identifying the mechanisms driving the repellencies.

Fires are hard to prepare for. About the best scientists can do, Hallema said, is develop better models so water and forest managers can make better decisions.

—Megan Sever (@MeganSever4), Science Journalist

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