

Drinking Water Board Packet

November 3, 2020

Agenda



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF DRINKING WATER
Marie E. Owens, P.E.
Director

Drinking Water Board

Roger Fridal, Chair
Kristi Bell, Vice-Chair
Scott Morrison
Jeff Coombs
David O. Pitcher
Eric Franson, P.E.
Barbara Gardner
Blake Tullis, Ph.D.
L. Scott Baird
Marie E. Owens, P.E.
Executive Secretary

DRINKING WATER ELECTRONIC BOARD MEETING
Via GoToMeeting

To Join: <https://www.gotomeet.me/ColtSmith/drinking-water-board-meeting-november-3-2020>
November 3, 2020 1:00 PM

DRAFT

1. Call to Order
2. Electronic Meeting Notice - Roger Fridal
3. Roll Call – Interim Director/Division Staff
4. Approval of the September 1, 2020 Minutes
5. 2021 Drinking Water Board Meeting Schedule (Board Action Needed)
6. Disclosure for Intent to Publicly Comment - Roger Fridal
7. Disclosure for Conflict of Interest - Roger Fridal
8. Financial Assistance Committee Report
 - A. Status Report – Michael Grange
 - B. Project Priority List – Michael Grange
 - C. SRF Applications
 - i) STATE
 - a. Wallsburg Town - Skye Sieber
 - b. Virgin Town Deauthorization – Skye Sieber
 - ii) FEDERAL
 - a. Moroni City - Skye Sieber
 - b. Provo City - Skye Sieber
9. Rural Water Association Report – Dale Pierson
10. Directors Report – Interim Director/Division Staff
 - A. Enforcement Report

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- B. New Employees; Danielle Zebelean, Hunter Payne, Brent Arns, Kerri Minerich
- C. Other

11. Public Comment Period - Roger Fridal

12. Open Board Discussion - Roger Fridal

13. Other

14. Next Board Meeting

Date: January 12, 2021
Time: 1:00 PM
Place: To Be Determined

15. Adjourn

Agenda Item

4



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DRINKING WATER ELECTRONIC BOARD MEETING

Via GoToMeeting

September 1, 2020 1:30 PM

DRAFT MINUTES

1. Call to Order

Roger Fridal, Chair, called the Board meeting to order at 1:31 PM and read the written determination to hold the meeting electronically.

2. Roll Call – Marie Owens

Board Members present: Roger Fridal, Kristi Bell, Scott Morrison, Eric Franson, Blake Tullis, Jeff Coombs, David Pitcher, Barbara Gardner, Scott Baird.

Division of Drinking Water (Division, DDW) Staff present: Marie Owens, Director, Michael Grange, Heather Pattee, Skye Sieber, Allyson Spevak, Nathan Lunstad, Mimi Ujiie, Mark Berger, Julie Cobleigh, and Colt Smith.

3. Approval of the Minutes:

A. June 9, 2020

- David Pitcher moved to approve the June 9, 2020 minutes. Kristi Bell seconded. The motion was carried unanimously by the Board.

B. July 20, 2020

- Scott Morrison moved to approve the July 20, 2020 minutes. Jeff Coombs seconded. The motion was carried unanimously by the Board.

4. Disclosure for Intent to Publicly Comment - Roger Fridal

No disclosure for the intent to publicly comment was made.

5. Disclosure for Conflict of Interest - Roger Fridal

Roger Fridal disclosed a conflict of interest regarding the Bear River Water Conservancy District (BRWCD) project (Item 6(D)(1)(b)) as he is the mayor of Tremonton City.

The Board agreed that Roger be allowed to comment but abstain from voting on the BRWCD project.

6. Financial Assistance Committee Report

A. Status Report – Michael Grange

Michael Grange, Technical Assistance Section Manager with the Division of Drinking Water reported that currently there is a balance of approximately \$4,500,000 in the State SRF fund. Over the course of the next year, the Division is expecting \$4.5 million to be added to the fund. By August 1, 2021 there will be a total of approximately \$8.9 million available for State project allocation.

The SRF staff are currently working on closing loans for projects with Kane County, Virgin Town and Genola. Staff will follow up with Aurora City to determine if they want to proceed with their project which was authorized in August 2018. With projects as old as this, staff recommends that the loan be defunded and the applicant come back before the board with an updated project as the bids are probably no longer valid.

Michael then reported that currently there is a balance of just over \$17,000,000 in the Federal SRF fund. Over the course of the coming year, the Division is expecting another \$21 million to come into the fund from the EPA capitalization grant, state match, and principal and interest payments. By August 1, 2021 there will be a total of approximately \$38 million available for federal program projects.

SRF staff are currently working with Hyde Park and Sigurd Town to close their loans. Canyon Meadows' loan is now closed and the system is ready to start construction on their project. Staff are working with Forest Glen B to bring back the remaining balance, \$50,000, in their escrow account as they don't have a need for that funding.

B. Project Priority List – Michael Grange

Michael Grange reported that two new projects are recommended to be added to the Project Priority List: Wilson Arch West with 43.5 points with a pump and motor upgrades and replacement project, and Provo City with 12.9 points with a project consisting of two pump stations for aquifer storage and recovery. The Financial Assistance Committee recommends the Board approve the updated Project Priority List as presented, with the addition of these projects.

- Jeff Coombs moved to approve the updated Project Priority List. Kristi Bell seconded. The motion was carried unanimously by the Board.

C. SRF Debt Relief Policy - Michael Grange

During the June 9, 2020 Drinking Water Board Meeting, the Board requested a legal review of the SRF Debt Relief Policy as it pertains to declared states of emergency. During this, September 1, 2020 meeting, Paul McConkie, Assistant Attorney General, detailed his opinion on the matter.

Upon reviewing the authorities of both State and local governments, Paul is satisfied that both the Governor and local authorities have the authority to declare emergencies under Utah Code Title 53-2a. Paul also reviewed the SRF Debt Relief Policy in light of both the Federal and State Safe Drinking Water Acts and he is satisfied that the policy does comply with the law. The State has the ability and is given the latitude to adopt this policy to provide debt relief during declared states of emergency.

Paul pointed out that the loan parameters were amended in 2018 with the America's Water Infrastructure Act. In regards to loan parameters, Paul went on to make a correction to what was stated in the memorandum under subpart II. Application of Debt Relief Policy. For the record the correction comes from 40 CFR § 35.3525(a): "This assistance may be done by subpart I adjustment interest rate loans down to zero (0%) provided the recipient began annually repayment of principal and interest no later than 18 months after project completion." The correction within the memorandum is to subpart II(2): the corrected language now reads, "loan repayment is completed no later than 30 years after project completion, and 40 years for a disadvantaged community."

Michael confirmed for Blake Tullis that debt forgiveness isn't an option for loan recipients.

Paul confirmed that the policy reads as such to include an official state of emergency declared by either a State or local authority.

Eric Franson stated that even if a state of emergency is declared by anyone with that authority it doesn't necessarily trigger any decisions regarding loan relief. All situations will be evaluated independent of the state of emergency. In the end, declaring the state of emergency is a trigger but the work of assessing, understanding, and potentially adjusting a loan is left up to the staff working on those individual situations.

The key point in Paul's memorandum is that the declared state of emergency gives the ability for someone to apply for relief and then the Board or the Board's designee will make the decision to grant relief or not. The burden is on the applicant to show financial hardship to qualify for relief. As the Board considers the application, they will apply the law and the factors to determine whether relief is justified.

The policy was temporarily approved at the June 9, 2020 meeting until the legal opinion was obtained, in case there were water systems that may want to apply in the meantime.

- David Pitcher moved to approve the Debt Relief Policy that was presented. Eric Franson second. The motion was carried unanimously by the Board.

Michael Grange informed the Board that the Governor has issued an Executive Order extending the pandemic response; the Legislature failed to uphold it. So, every 30 days, as the Governor sees fit, he will review the Executive Order and decide to extend it or not.

Michael noted that the policy states 180 days after the declared emergency has ended, the Board no longer needs to or is required to accept applications for financial relief. Michael said that the Division is still not sure when water systems may apply for debt relief; would the Board be willing to entertain requests that extend beyond the 180 days after the declared emergency has ended? In regards to the pandemic, some water systems may not realize a shortfall until further down the road, maybe into 2021.

Eric believes that six months should be sufficient to take care of any issues. Furthermore, Eric thinks that due to an emergency, these systems are going to have to restructure their own debt, not just on the water system, but maybe on other components to their financial situation which may include raising water rates.

Blake pointed out that the wording to extend the 180-day timeframe is already in the policy: "The Board reserves the right to extend or shorten this timeframe based on extenuating circumstances." Blake likes the 180-day timeframe which gives people a solid deadline to reference. Scott Morrison and Roger Fridal both agreed with Eric and Blake.

D. SRF Applications

1) STATE

a. Axtell Community Service Distribution - Skye Sieber

Representing Axtell Community Special Service District was Travis Blackburn, Chair of the District, Jay, board member, and their engineers.

Skye Sieber informed the Board that Axtell Community Special Service District is requesting funding to assist with the planning and permitting needed to develop a secondary water source. A secondary source would meet Division requirements for communities which have more than 100 connections. The district intends to pursue construction funding through USDA Rural Development, but planning and permitting is first required. The deliverables for this planning project would be a preliminary engineering report, environmental clearances, and easements from the Bureau of Land Management and Utah Division of Water Resources.

The total amount for this planning effort is \$133,000; Axtell received a \$30,000 grant from USDA Rural Development and is requesting \$103,000 from the Board. The local MAGI for Axtell is \$47,200 which is 98% of the State MAGI. The current average water bill is \$56.13 which is 1.43% of the local MAGI. Their after-project water bill at full loan would increase to \$60.80 which is 1.55% of the local MAGI.

The Financial Assistance Committee recommends that the Board authorize a loan of \$103,000 at 2% interest for 20 years to Axtell Community Service Distribution.

Travis Blackburn explained to the Board that developing a secondary source is complicated by public lands, but having it would help the community. Travis confirmed for Scott Morrison that the secondary source being contemplated is a spring which needs to be developed.

Jeff Coombs inquired about the effect of the pipeline construction on the water bill. The District confirmed the construction would pose a significant financial burden on the community and in turn the water bill.

The District currently shares a source with Willow Creek Irrigation Company which owns the water rights. The District met with the Willow Creek Board which approved Axtell to explore the spring area as Axtell owns stock in the Willow Creek Irrigation Company. There have been discussions that going forward there will need to be a legal agreement between the two entities.

The District has met with both the Division of Water Resources and the Bureau of Land Management to determine their requirements for taking the pipeline across their lands. The former will need to go through the NEPA process to determine if the project will be feasible.

Marie pointed out that Axtell's IPS report shows that they failed to submit their 2015 consumer confidence report and have yet to submit the 2020 report. The District reported that they're working on completing the 2015 report. The District was under the impression that the 2020 report was complete. Marie asked that the system ensure documentation is submitted for both missing reports.

- Eric Franson moved that the Drinking Water Board authorize a loan of \$103,000 at 2% interest for 20 years to Axtell Community Special Service District. Jeff Coombs seconded. Eric amended his motion to include that the authorization is contingent upon resolution of outstanding IPS issues. Jeff Coombs accepted the amendment. The motion was carried unanimously by the Board.

b. Bear River Water Conservancy District - Heather Pattee

Representing BRWCD was Carl Mackley, General Manager.

Heather Pattee informed the Board that Bear River Water Conservancy District has a project consisting of two test wells for the Harper Ward area. They're going to use the information from the test wells in order to drill future larger production wells. Harper Ward does not currently have their own source. The cost of the project is estimated at \$402,010; BRWCD would contribute 50%, so the request from the Board would be \$201,005. The local MAGI for BRWCD is approximately 98% of the State MAGI. The after-project water bill would be \$71.39 which is 1.9% of the local MAGI. That amount would be over the recommended 1.75% of the local MAGI, so they do qualify for additional subsidy.

The Financial Assistance Committee recommends that the Board authorize a loan of \$141,000 at 0% interest for 20 years and a grant of \$60,005 to Bear River Water Conservancy District.

Heather clarified for Marie that the financial assistance was based on the Harper Ward area and not BRWCD as a whole.

- David Pitcher moved that the Drinking Water Board authorize a loan of \$141,000 at 0% interest for 20 years and grant of \$60,005 to Bear River Water Conservancy District. Scott Morrison seconded. The motion was carried unanimously by the Board.

c. Caineville Special Service District - Heather Pattee

Representing Caineville Special Service District was John Jackson, General Manager, and Kelly Chappell, engineer with Ensign Engineering.

Heather Pattee informed the Board that Caineville Special Service District has a project consisting of a treatment facility, fire hydrants, and tank upgrades. The cost of the project is estimated at \$600,000 with Caineville contributing \$5,000. No information was available for Caineville's MAGI as they're not a part of a town or municipality. In light of this, staff considered two different methods to determine if they qualified for additional subsidy: 1) The MAGI for the neighboring town of Hanksville was used which closely approximates Caineville's economic conditions. Hanksville's MAGI is 45% of the State MAGI. At full loan the estimated after-project water bill would be \$156.15 which is 8.6 % of the local MAGI. 2) The MAGI was used for the zip code which was \$34,800 or 72.5% of the State MAGI. At full loan the after-project water bill would be 5.39% of the local MAGI. In either method Caineville does qualify for additional subsidy.

The Financial Assistance Committee recommends that the Board authorize a loan of \$295,000 at 0% interest for 30 years and a grant of \$300,000 to Caineville Special Service District. Conditions include that they resolve any deficiencies on their IPS report and implement a rate structure for the water system.

David Pitcher asked which source is being treated and what is the type of treatment plant. John Jackson responded that the well is located in the Red Desert, four miles west of Caineville. It is an artesian well that maintains 20 lbs. of pressure at the well head and includes four miles of pipe. Treatment is needed for its high iron and manganese content; they use chlorine gas to oxidize the iron.

John Jackson expressed appreciation to the Board for their assistance. Caineville is an old system with parts that are hard to come by.

Jeff Coombs inquired if the residents are okay with the water bill going up. John replied that although the residents don't want their bill to increase, many residents are on the board and recognize that this project must happen.

The deficiency on their IPS report is minor; a missing check valve on the well. Marie stated that the Division recognizes there is no public health risk associated with this deficiency.

- Jeff Coombs moved that the Drinking Water Board authorize a loan of \$295,000 at 0% interest for 30 years and a grant of \$300,000 to Caineville Special Service District. Conditions include that they resolve any issues on their IPS report and implement a rate structure for the water system. Kristi Bell seconded. The motion was carried unanimously by the Board.

2) FEDERAL

a. Provo City - Skye Sieber

Skye Sieber informed the Board that Provo City requested that their project be moved to the November 3, 2020 Drinking Water Board Meeting because they're pursuing additional funding at the October Board of Water Resources meeting.

b. Wilson Arch Water & Sewer Company - Skye Sieber

Representing Wilson Arch Water & Sewer Company was Dawn Howe and Dan Hawley, their consultant from Jones and DeMille Engineering.

Skye Sieber informed the Board that the Wilson Arch Water & Sewer Company loan application came in after the Financial Assistance Committee meeting, so this will be a staff recommendation. The company is in San Juan County and is requesting funding to upgrade distribution pumps, motors, and controllers for the west side system. During a recent technical inspection, it was discovered that one of the pumps is on the verge of failure and needs to be replaced soon to prevent contamination of the system. This project is for federal funding and scored 43.5 points on the project priority list.

The total amount of funding needed is \$58,800; the system will contribute \$800 of in-kind labor and is requesting \$58,000 from the Board. The local MAGI, based on the zip code area for the Wilson Arch community, is \$35,700 which is 74% of the State MAGI. The system currently provides water to 18 connections and the average water bill is \$83.22 which is approximately 2.8% of the local MAGI. At full loan the after-project water bill would be \$96.99 which is 3.26% of the local MAGI. Based on the ratio of the local MAGI to State MAGI, as well as their after-project water bill, they do qualify for additional subsidy.

Division staff recommends that the Board authorize \$58,000 in principal forgiveness to Wilson Arch Water & Sewer Company.

At the time of this meeting the Division had the two sides of this system divided; Wilson Arch West and Wilson Arch East. The intent is to consolidate the two sides into one public water system, Wilson Arch Water & Sewer Company. Marie reported that the Division artificially separated the two sides in an effort to help the system but that it was the wrong step. The Division needs to consolidate the two sides into one system. The system's intent is to then move the system to the special service district.

Marie reported that Wilson Arch East is currently a public water system and is in good standing with the Division. Wilson Arch West has significant deficiencies on their IPS report for unapproved facilities which include a pump facility, two storage tanks and two wells. Dawn Howe clarified that those facilities are a part of the engineering report that has yet to be approved.

Jeff Coombs asked that if the two sides are combined will it affect the MAGI and water bill. Dawn Howe responded that in the loan application she included the populations for both sides.

- Eric Franson moved that the Drinking Water Board authorize \$58,000 in principal forgiveness to Wilson Arch Water & Sewer Company. Scott Morrison seconded. The motion was carried unanimously by the Board.

7. Rural Water Association Report – Dale Pierson

Dale Pierson informed the Board that in the packet are the reports from the three individuals who perform work under contract with the Division. There have been some recent staff changes within RWAU; Terry Smith is now the compliance circuit rider and Janell Braithwaite is the new management technician. Janell introduced herself to the Board; she was previously the city recorder for Gunnison City and gained a lot of experience with water and sewer projects and funding.

8. Legislative Audit Report – David Gibson and Matt Harvey

David Gibson, Matt Harvey and Darin Underwood of the Office of the Legislative Auditor General presented to the Board the report of the 2020 Department of Environmental Quality (DEQ) Legislative Audit. Darin said that Marie was incredible to work with and that DDW was one of their favorite divisions. Also, DDW had the most complete record of data.

Chapter I Introduction

David Gibson presented the in-depth budget review of DEQ. Chapter I of the report provides various funding information including DDW revenues generated from fees and permits from 2015 to 2019. The total increase from 2015 (\$185,928) to 2019 (\$231,385) is about 24%. DDW has the lowest expenses of the DEQ divisions for Attorney General service expenditures. The Division's Attorney General expenses increased 89% from 2015 (\$27,800) to 2019 (\$52,662) which is the highest percent change within DEQ.

A major theme of the auditors' review was evaluating DEQ's regulatory efficiency and effectiveness. Regulated entities, inspections, deficiencies/violations, enforcement actions and compliance are key data framework elements that the auditors believe are essential to the Divisions' oversight and the entities that they regulate. The auditors found that some programs did not comprehensively collect certain elements of the framework or did not store them in such a way that the data was usable. Fortunately, DDW had all the elements needed to help the auditors determine their compliance.

Chapter II Division of Drinking Water Can Improve Water Systems' Time to Compliance

Of the four sizes of water systems which the Division regulates, the larger systems tend to resolve violations more quickly than the smaller systems. Very small systems which serve populations of 500 or fewer are more likely to allow violations to go uncorrected longer. One reason for this is that very small systems lack the expertise of larger systems which help correct violations.

The median time for water systems to correct significant deficiencies has been improving; the time to compliance has gone from 1,020 days in 2005 to just over 74 days in 2019. Although some water systems are still slow to resolve significant deficiencies. Most deficiencies were corrected

in less than one year, but 940 deficiencies, or 29%, took between one to five years to correct. While 114 deficiencies, or 4%, took five years or longer to correct. This is concerning because uncorrected significant deficiencies have the potential to lead to water contamination and public health problems.

The auditors found that the Division lacked enforcement action in earlier years but the trend toward enforcement has recently increased. In 2019 the Division enforced on 56 significant deficiencies, while 321 significant deficiencies received no enforcement. The auditors estimate that since 2015 the Division took enforcement action on 10% of the significant deficiencies. The Division has never issued a fine for a violation.

Exemptions from Rule are allowed by Utah Administrative Code. An exemption allows a water system to operate with a significant deficiency without enforcement from the Division. The auditors found that the Division does not periodically review compliance exemptions that it has granted to water systems. The number of exemptions granted is increasing, but oversight over past exemptions is not. The Division has 1,099 deficiency exemptions on record since 1981 without a mechanism for exemptions to be revisited either through periodic review or through expiration. Significant deficiencies posing public health hazards can persist indefinitely.

Auditor Recommendations for DDW

1. The auditors recommend that the Division of Drinking Water utilize its enforcement authority to correct significantly noncompliant water systems.
2. The auditors recommend that the Division of Drinking Water track and report the time it takes for its regulated entities to reach compliance.
3. The auditors recommend that the Division of Drinking Water periodically review water system exceptions for continued appropriateness.

In conclusion, the auditors pointed out that the overall direction of Division is the median time to correct deficiencies coming down, improving solving deficiencies, taking enforcement actions, and reviewing exceptions.

(DDW Director Marie Owens gave the Division's response to the audit under Item 10(A) Director's Report Legislative Audit Response.)

9. DDW Fee Update – Julie Cobleigh

Julie Cobleigh gave the Board an update on the Division's strategic planning process, highlighting fees. The strategic plan encompasses three goals; 1) strengthen public water systems through effective partnerships, 2) commitment to regulatory responsibilities, and 3) commitment to excellence. Under Goal #2, Objective #1 is to become sustainable and secure by diversifying balanced funding through developing a new fee structure. The subcommittee for Objective #1 evaluated and developed fee options, reviewed other states' fee structures, sought DDW internal feedback, conducted a strengths and weaknesses analysis, and from there created a fee proposal.

The fee proposal was presented to the Strategic Planning Committee. Two fee options were identified:

- 1) **Base Fees** are charged to the water systems annually (or on some other time interval). The fee can be a flat rate or it can scale based on the number of connections, the population count, or another parameter. Base fee options include a flat fee for all systems, based on system type, based on system size classification, charge per connection, and a charge per usage.
- 2) **Service Fees** are fees paid by water systems for specific services such as plan reviews, site visits, or sanitary surveys. The fees can vary based on the complexity of the task and/or the amount of staff time required. Service fee options include a SRF application fee, plan review and operating permit fee, new PWS review fee, exception fee, source protection fee, and a sanitary survey fee.

Based on their research and the strengths and weaknesses analysis, the subcommittee concluded the best approach was a hybrid; a base fee based on size classifications, and service-based exception fees. The subcommittee saw the importance of the equitability of a fee based on size and such a fee would provide a predictable and sustainable revenue stream. This base fee is also simple to implement and gives the Division the ability to be transparent and clear in its communication with public water systems. The exception fees came out of the Legislative audit which found that the Division should be reviewing and renewing exceptions on an ongoing basis. The exception fees would help to build the internal capacity needed to review and renew exceptions. The proposed exception fee schedule is broken into three tiers; Tier I - \$400 for simple exceptions; Tier II - \$750 for medium complex exceptions; and Tier III - \$1500 for complex exceptions.

Scott Morrison has been supporting the Strategic Planning Committee from the start and he commended Marie and the staff on their efforts. He reported that the work has been progressing well.

10. Directors Report – Marie Owens

A. Legislative Audit Response

Marie started by thanking Darin and the audit team and said that the Division will very seriously address the audit findings. The auditor team was wonderful to work with and communicated with the Division throughout the process. Early on we recognized that there were vulnerabilities within the Division. During the audit process, it was clear to the Division where the auditors were honing in and what they were finding, so DDW wasn't blindsided by this report. The audit process became part of the reason why the Division engaged in strategic planning.

The audit report highlighted the Division's significantly low revenue stream for dedicated credits as compared to the rest of DEQ's divisions. DDW has been sorely underutilizing the ability to collect fees for its entire existence and that needs to be rectified. The Division is likely to receive pushback from the regulatory community as it transitions to charging fees. At the time of this meeting the Division was six weeks into charging cost recovery fees for water systems that require extra attention for violations and enforcement orders. Since their inception, the Division has been communicating these cost recovery fees to the Board. The water systems can avoid these fees if they choose to come into compliance or avoid incurring violations.

Earlier in the meeting Julie Cobleigh presented the next fees proposed by the Division. With these proposed fees, water systems will be charged, on a tiered basis, for exceptions from rule. With the exception fee, a water system will have to decide if they want to pay to have the exception or, pay to fix the issue for which they are requesting an exception. Water systems will not be charged a fee for exceptions that are not granted. These proposed fees will take a year to be approved (by the Legislature) and be put into use, in the meantime the Division will continue to talk to the Board about them. The Division ended up with nearly 1,100 exceptions on record because historically it recommended exceptions to the water systems even if they weren't requested because they allowed us to avoid confrontation.

Starting this year, the Division will now only grant exceptions which expire and they're trying to communicate to the water systems that if you receive an exception which then expires, you will have to pay for its renewal. The Division will need to review the 1,100 existing exceptions and put them on a renewable schedule, but it currently doesn't have enough staff to perform that function. Currently, the Division only has enough engineering staff to review incoming plan reviews, issue operating permits, and handle new exception requests. The Division processes about 100 exception requests per year.

Another fee that the Division is considering is to annually charge water systems a fee for DDW's regulatory oversight. This fee would provide a sustainable source of revenue through dedicated credits. The existing cost recovery fees and the proposed exception fees are not sustainable sources of revenue because the water systems can choose to avoid them.

Marie wants to be sure the Board is aware of the direction the Division is going and asks the Board to voice input, concerns, or direction for the staff. The Board needs to be engaged enough that when people reach out to the Board members with questions or concerns they can either speak to the direction or push the questions back to the Division.

Jeff Coombs expressed concern that if the Division receives Legislative approval for some or perhaps all of the fees, will the general funds be reduced?

Marie clarified for Jeff that the money the Division receives from the general fund is almost exclusively from the WIRA account which is authorized to the Board for their matching amount to be able handle the SRF program. This money creates the State SRF fund, but a small amount, approximately \$1.2 million, of the WIRA account, which isn't required for SRF matching, is the amount of general fund for the Division itself. Scott Baird added that the intent isn't to replace general funds but rather to supplement the program and moving forward we anticipate using federal funds, general funds, and fees to help balance the program.

Eric Franson asked why there is such a large discrepancy between DDW and the other DEQ divisions regarding revenues and how did that happen?

Scott Baird replied that one reason is the demand for services on the other divisions compared to DDW. As the other programs provided new services they were able to charge new fees. Also, the initial federal funding structure for DDW differed from the other programs. Over the last several

decades it has been the status quo within DDW, but that is changing with the Division working toward getting systems into compliance and as such the federal funding is no longer sufficient.

Marie pointed out the other divisions have lengthy fee schedules and up until last year DDW had only three or four fees. Compared to the other divisions, DDW hasn't incurred as many legal fees because they haven't legally enforced anything throughout the history of its program. The Division needs to start using its enforcement authority in order to address that particular audit finding which in turn will lower time to return to compliance. DDW has estimated it will need about \$300,000 in legal fees to meet their responsibility to enforce the Safe Drinking Water Act. In order to meet that financial need, the Division is starting to look at dedicated credits.

In working with many water systems as an engineer, Eric understands the pushback that will occur on the fees. It's also important to understand the operational similarities amongst the divisions and getting them all on the same playing field. It's more important to understand the big picture of the entire DEQ and the need to balance all of the divisions, as opposed to just focusing on how this will negatively impact the water systems.

Scott Morrison agreed with Eric's comments. Scott mentioned that staff looked at how other states are funding their Drinking Water programs. The fees being proposed are consistent with how other states are handling it.

Marie stated that the Division of Drinking Water is going to re-identify as being a regulator. For years the Division has been so focused on technical assistance that perhaps we've forgotten that our core responsibility is to implement and enforce the Safe Drinking Water Act. The Division has a lot of great partners who can provide technical assistance to the water systems. The water systems are going to characterize the enforcement as detrimental and hitting their bottom line. Marie hopes that they will recognize it as a renewed commitment from the Division to follow up with the water systems, pay attention and be present throughout the process until issues are resolved.

Blake Tullis asked if Marie sees a conflict of interest or a perceived conflict of interest where people are basically paying for an exception? There could be the perception where the Division will provide more exceptions in order to bring in more revenue.

Marie responded that the rate of granting exceptions has dropped significantly under her leadership than it did under the former director's leadership. In the past the Division was pushing exceptions because it made their lives a lot easier while conducting sanitary surveys and inspections. Marie has decreased the number of granted exceptions because an exception says, it's ok for you to live with a significant deficiency, and Marie only grants an exception when the water system can demonstrate that there is sufficient public protection to equal the rule that was put in place. If an exception is granted, the Division is requiring additional monitoring or other steps the water system must take to ensure public protection. Marie doesn't know if the old, existing exceptions are providing adequate protection or are simply providing a free pass and as such they all need to be reviewed. The Division is fully aware that requests for exceptions will likely go down if fees are attached to them. The exception fees will be proposed for public comment very soon, followed by a public hearing.

The fee that the Division will rely on, which is one or two years out, is an annual water system fee because she doesn't want to get in a mode where we have to try to get more of the items that we do have fees on. The Division is shooting for dedicated credits to make up 25-30% of its portfolio. The Division wants to work out the details of an annual fee with its stakeholders. If the Legislature can't provide interim funding, the Division will need to implement an annual fee sooner rather than later. The building block granted to the Division during the 2020 Legislative Session would have given them five years for this transition, but was rescinded because of the pandemic. The Division will continue to seek future building block funding.

David Pitcher stated that it's a difficult position to be in where the number of small systems and the amount of technical assistance and also deficiencies applied to the smaller systems. The smaller systems are probably the least able to fund proportionate to the time and effort.

Marie said that David is right, the ability to pay becomes an issue. Will a water system who receives a loan from the Board with full principal forgiveness be able to pay an annual fee? The Division wants stakeholder buy-in to determine that the annual fee will be appropriate and seem fair to the industry as a whole.

David's opinion is that Utah is not nationally known to be a hard regulator but they provide technical assistance. He would hate to see that pendulum swing too far, but he isn't hearing that is being proposed. He thinks everyone wants to do well and doing so is for the public health of everyone.

Marie added that the Division hopes to soon develop and track a performance measure for the time to return to compliance on individual deficiencies. Once developed, the Division will share that performance measure with the Board and the Legislature. The Division wants to be genuine on the data it is presenting. Marie reiterated that the Division would really like input and feedback from the Board on the best way forward. Marie appreciated David's comment because the Division doesn't want to swing too far and be strictly focused on enforcement and not really understand the realities faced by small and large water systems; it needs to find a balance.

In closing, the Division agrees with the audit; they did a fair assessment and their findings are accurate. The Division is going to try to be responsive to the audit findings and resolve those situations.

B. Enforcement Report

Marie informed the Board that within the enforcement report, all of the water systems listed under corrective action have entered into legally binding enforcement agreements with the Division. The currently Not Approved water systems are also listed in the report with whom the Division are also working. Historically, the Division has not enforced on these orders, but they're now starting to move forward with enforcement.

C. New Employees: Mark Berger

Mark Berger was recently hired to be the new Rules Manager, replacing Rachael Cassady. Mark comes to DDW from the Division of Air Quality.

Other Division Personnel Changes

Assistant Director Ying-Ying Macaulay retired on August 1, 2020 and Nathan Lunstad has taken her place.

Michael Newberry is now the Permitting Manager, taking Nathan's place.

Several DDW recruitments were open at the time of this meeting; financial analyst, (2) engineering positions, and a level IV water treatment specialist / surface water treatment rule manager.

D. Other

11. Public Comment Period - Roger Fridal

No public comments were made.

12. Open Board Discussion - Roger Fridal

There was no open board discussion.

13. Other

14. Next Board Meeting

Date: November 3, 2020
Time: 1:00 PM
Place: To Be Determined

The Board discussed whether or not to hold this meeting in person or electronically. Jeff Coombs and Barbara Gardner would like to continue electronic meetings for the time being. Blake suggested the Board meet again in person when it's safe to do so but perhaps with the option for presenters to attend electronically. Eric Franson and Roger Fridal prefer face to face interaction and would like to hold the meetings in the same space when it's safe to do so.

15. Adjourn

- David Pitcher moved to adjourn the meeting. Blake Tullis seconded. The motion was carried unanimously by the Board.

The meeting adjourned at 3:56 PM.

Agenda Item

5

Drinking Water Board
2021 Proposed Meeting Schedule

Option #1 (Two Mtgs at RWAU)

Tuesday January 12, 2021
(Scheduled)

Thursday March 4, 2021
(RWAU Conference)

Tuesday June 8, 2021

Tuesday August 31, 2021
(RWAU Conference)

Tuesday November 2, 2021

Tuesday January 11, 2022

Option #2 (All Mtgs @ DEQ Brd Rm or Virtual)

Tuesday January 12, 2021
(Scheduled)

Tuesday March 9, 2021

Tuesday June 8, 2021

Tuesday September 7, 2021

Tuesday November 2, 2021

Tuesday January 11, 2022

Agenda Item

8(A)

DIVISION OF DRINKING WATER
FEDERAL SRF
AS OF September 30, 2020

FIRST ROUND FUND		FEDERAL SECOND ROUND FUND		Hardship Fund
1997 thru 2020 SRF Grant		Principal Repayment	Earnings on Invested Cash Balance	
Net Federal SRF Grant	\$187,337,761	Principal (P):	\$74,039,348	Total: \$1,252,444
Total State Matches:	\$43,453,300	Interest (I):	\$19,981,484	Total: \$1,394,996
Closed Loans:	-\$228,897,701	Total P & I:	\$94,020,832	
Total Grant Dollars:	\$1,893,360			

SUMMARY	
Total Federal State Revolving Fund:	\$97,166,636
Total Federal Hardship Fund:	\$1,394,996
Subtotal:	\$98,561,632

LESS AUTHORIZED & PARTIALLY DISBURSED	Less:		
	Authorized & Partially Disbursed Closed Loans:	\$66,967,586	(see Page 2 for details)
	Authorized Federal Hardship:	\$502,327	
	Subtotal:	\$67,469,913	

PROPOSED	Proposed Federal Project(s):	\$10,923,000	(see Page 2 for details)
	Proposed Federal Hardship Project(s):	\$0	
	Subtotal:	\$10,923,000	

AS OF: September 30, 2020	TOTAL REMAINING LOAN FUNDS:	\$19,276,050
	TOTAL REMAINING HARDSHIP FUNDS:	\$892,669

Total Balance of ALL Funds after deducting proposed actions: \$20,168,719

Projected Receipts thru October 1, 2021	
2022 Fed SRF Grant	\$0
2022 State Match	\$0
2021 Fed SRF Grant & State Match	\$10,295,560
Interest on Investments	\$2,011,200
Principal Payments	\$8,049,203
Interest	\$1,010,697
Hardship & Technical Assistance fees	\$397,056
Fund 5215 principal payments	\$107,200
Total:	\$21,870,915

Receive 60% in January

Total Estimated Federal SRF Funds Available through: 10/01/: **\$42,039,634**

DIVISION OF DRINKING WATER									
FEDERAL STATE REVIVING FUND									
PROJECTS AUTHORIZED BUT NOT YET CLOSED									
AS OF September 30, 2020									
COMMUNITY	Project			Authorized Date	Closing Date Scheduled or Estimated	Authorized From Loan Funds (1st or 2nd Round)			Hardship Fund
	Total Project	Terms	Loan #			Loan	Forgiveness	Total	
Hyde Park City	5,994,000	2.91% HGF 20 yrs	3F1744	Jan-20		5,000,000		5,000,000	
Sigurd Town	2,300,000	0% 30 YRS	3F1745	Jun-20		1,500,000	800,000	2,300,000	
San Juan Spanish Valley	300,000	0% 30 YRS	3F1755	Jun-20		420,000	180,000	600,000	
Woodland Hills	3,200,000	0% 30 yrs	3F1767	Jul-20		2,600,000	300,000	2,900,000	
Willow Creek Water Co	123,000	1% 20 years	3F1759	Jun-20					123,000
Wilson Arch	58,000	100% principal forgiveness	3F1770	Sep-20					58,000
								0	
TOTAL CONSTRUCTION AUTHORIZED:						\$ 9,520,000	\$ 1,280,000	#####	\$ 181,000
COMMITTED ADVANCES / AGREEMENTS or PARTIALLY DISBURSED CLOSED 2ND ROUND AGREEMENTS:									
					Date Closed				
								0	0
Rural Water Assn of Utah	676,000	5 yr contract for Development	Ongoing	Jan-18	Jun-18			0	123,240
Forest Glen Plat A HOA	1,438,986	0% int 30 yrs	3F222	Feb-14	Dec-14	57,000	24,986	81,986	
Moab	90,000	100% pf engineering planning study	3F292P	Aug-17	Feb-18		90,000	90,000	
Granger Hunter Improvement	#####	1.25% HGA 20 yrs (portfolio)	3F1708	Feb-19	Jul-19	15,817,600		15,817,600	
Kearns Improvement District	#####	1.25% hgf 20 yrs (portfolio)	3F1725	Jun-19	Dec-19	13,600,000		13,600,000	
Valley WTP	#####	1.25% HGF 30 yrs	3F1731	Aug-19	Jun-20	15,820,000		15,820,000	
Central Utah WCD	#####	1.25% HGF 20 yrs (portfolio)	3F1741	Nov-19	Jun-20	7,900,000		7,900,000	
Lincoln Culinary Water Assn	2,516,000	60/40 1.25% hgf 30 yrs	3F1696	Jan-19	Jul-20	1,108,000	738,000	1,846,000	
Swiss Alpine Water Co	1,752,000	75% HGF 30 yrs	3F300	Feb-20	Jul-20	1,012,000		1,012,000	
Spring Creek	57,947	100% principal forgiveness	3F1746	Feb-20	Apr-20			0	57,947
Summit Culinary Water	36,600	100% pf 5 point analysis	3F1694P	Jun-18	Jul-18			0	23,140
Distribution	40,000	5 yr 0% master plan & gw well siting	3F1719P	Mar-19	May-19			0	500
Hildale City	40,000	100% pf master plan	3F1704P	Nov-18	Oct-19			0	40,000
Central Iron Co WCD	40,000	100% pf master plan	3F1727P	Apr-19				0	40,000
New Paria Subdivision	36,500	100% pf	3F160P	Apr-20	Oct-20			0	36,500
TOTAL PLANNING AUTHORIZED:						\$55,314,600	\$852,986	\$56,167,586	\$321,327
TOTAL CONSTRUCTION & PLANNING:								\$66,967,586	\$502,327
AVAILABLE PROJECT FUNDS:									\$30,199,050
AVAILABLE HARDSHIP FUNDS:									\$892,669
PROPOSED PROJECTS FOR September 2020:									
Provo City	7,388,000	No lof	3F1764			7,388,000		7,388,000	
Moroni	3,535,000	1% HGF 30 yrs (disadvantaged No	3F1772			2,485,000	1,050,000	3,535,000	
TOTAL PROPOSED PROJECTS FOR THIS MEETING:						\$9,873,000	\$1,050,000	\$10,923,000	\$0
*RWau hardship grants being disbursed monthly									
TOTAL FUNDS AFTER PROPOSED PROJECTS ARE FUNDED:									\$19,276,050
TOTAL FUNDS AFTER PROPOSED HS PROJECTS ARE FUNDED:									\$892,669
NOTES OF LOAN CLOSINGS SINCE LAST BOARD MEETING:									
Total Recent Loan Closings						\$0	\$0	\$0	\$0

DIVISION OF DRINKING WATER
 FEDERAL SRF LOAN FUNDS
 AS OF September 30, 2020

	Loan Funds 1st Round	Loan Payments			TOTAL
		2nd Round		Hardship Fund	
		Principal	Interest		
Federal Capitalization Grants and State 20% match	\$230,791,061				
Earnings on Invested 1st Round Funds			1,252,444		
Repayments (including interest earnings on 2nd round receipts)		74,039,348	19,981,484	1,394,996	327,459,333
Less:					
Closed loans and grants	-228,897,701				-228,897,701
SUBTOTAL of Funds Available	\$1,893,360	\$74,039,348	\$21,233,927	\$1,394,996	\$98,561,632
Loans & Grants authorized but not yet closed or fully disbursed	-8,020,000	-58,094,600	-852,986	-502,327	-67,469,913
SUBTOTAL of Funds Available less Authorized	-\$6,126,640	\$15,944,748	\$20,380,941	\$892,669	\$31,091,719
Future Estimates:					
Proposed Loans/Grants for current board package	-10,923,000			0	-10,923,000
SUBTOTAL of Funds Available less Proposed Loans & Grants	-\$17,049,640	\$15,944,748	\$20,380,941	\$892,669	\$20,168,719
PROJECTIONS THRU October-2021					
2021 Fed SRF Grant & State Match	10,295,560				
2022 Fed SRF Grant	0				0
2022 State Match	0				0
Projected repayments & revenue during the next twelve months		8,156,403	1,010,697	397,056	9,564,155
Projected annual investment earnings on invested cash balance		1,620,000	360,000	31,200	2,011,200
TOTAL	-\$6,754,080	\$25,721,151	\$21,751,638	\$1,320,925	\$42,039,634

DIVISION OF DRINKING WATER
STATE LOAN FUNDS
AS OF September 30, 2020

SUMMARY		
	Total State Fund:	\$15,450,064
	Total State Hardship Fund:	\$2,653,790
	Subtotal:	\$18,103,853
LESS AUTHORIZED	Less:	
	Authorized Loans & Closed loans in construction:	\$8,184,000
	Authorized Hardship:	\$2,146,505
	Subtotal:	\$10,330,505
	Total available after Authorized deducted	\$7,773,348
PROPOSED	Proposed Loan Project(s):	\$100,000
	Proposed Hardship Project(s):	\$0
	Subtotal:	\$100,000
AS OF:		
September 30, 2020	TOTAL REMAINING STATE LOAN FUNDS:	\$7,166,064
	TOTAL REMAINING STATE HARDSHIP FUNDS:	\$507,285

(see Page 2 for details)

(see Page 2 for details)

Total Balance of ALL Funds: \$7,673,348

Projected Receipts Next Twelve Months: and Sales Tax Revenue	
Annual Maximum Sales Tax Projection	\$3,587,500
Less State Match for 2020 Federal Grant	\$0
Less State Match for 2021 Federal Grant	(\$2,202,200)
Less Appropriation to DDW/Board	(\$1,018,500)
SUBTOTAL Sales Tax Revenue including adjustments:	\$366,800
Payment:	
Interest on Investments (Both Loan and Hardship Accounts)	\$96,000
Principal payments	\$2,830,400
Interest payments	\$686,209
Total Projections:	\$3,979,409

Total Estimated State SRF Funds Available through 10-01-2021	\$11,652,757
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**DIVISION OF DRINKING WATER
STATE LOAN FUNDS
PROJECTS AUTHORIZED BUT NOT YET CLOSED
AS OF September 30, 2020**

N							
Community	Loan #	Cost Estimate	Date Authorized	Date Closed/Anticipated	Authorized Funding		
					Loan	Grant	Total
Aurora City 0.75% int 30 yrs	3S258	4,228,000	Aug-18		3,804,000	424,000	4,228,000
Kane Co WCD .81% int 20 yrs	3S1712	210,000	Feb-19	Oct-20	168,000	42,000	210,000
Virgin Town 0% int 20 yrs	3S1702	1,200,000	Jan-19		400,000	400,000	800,000
Genola City 0% int 30 yrs	3S1732	2,849,400	Aug-19		2,273,000	326,400	2,599,400
Bear River WCD 0% int 20yrs	3S1761	201,005	Sep-20		141,000	60,005	201,005
Caineville SSD 0% int 30yrs	3S1766	595,000	Sep-20		295,000	300,000	595,000
Subtotal Loans and Grants Authorized					7,081,000	1,552,405	8,633,405
PLANNING LOANS / GRANTS IN PROCESS							
Jensen WID grant	3S1757P	40,000	May-20	May-19		40,000	40,000
Fairview	3S1736P	40,000	Aug-19	Sep-19		40,000	40,000
Thompson SSD	3S1747P	29,500	Jan-20	Feb-20		29,500	29,500
Pinion Forest	3S1714P	70,000	Aug-19	Apr-20		20,000	20,000
Church-Wells	3S1751P	40,000	Mar-20	May-20		40,000	40,000
Sunset City pl grant	3S1754P	40,000	Apr-20	Jun-20		40,000	40,000
Eureka	3S1743P	20,000	Sep-19			20,000	20,000
Moroni pl grant	3S1752P	36,000	Mar-20			36,000	36,000
Austin SSD pl grant	3S1756P	40,000	hong	Sep-20		40,000	40,000
Genola City Water Tank	3S1732	250,000	Aug-19	Mar-20		250,000	250,000
Axtell Community SSD 20yrs 2%	3S1765P	103,000	Sep-20		103,000		103,000
Bristlecone WID	3S1762P	38,600	Jun-20	Sep-20		38,600	38,600
							0
Subtotal Planning in Process					103,000	594,100	658,500
CLOSED LOANS (partially disbursed)							
Mtn Regional-Community Wtr 2% 20 yr	3S254	2,600,000	Jul-18	Dec-19	1,000,000		1,000,000
Subtotal Closed Loans Partially Disbursed					1,000,000	0	1,000,000
TOTAL AUTHORIZED/PLANNING/OR CLOSED BUT NOT YET FUNDED					\$8,184,000	\$2,146,505	\$10,330,505
PROPOSED PROJECTS FOR Oct/Nov 2020							
Wallsburg 1.89% 10 yrs	3S1771P	100,000			100,000		100,000
Total Proposed Projects					100,000	0	100,000

DIVISION OF DRINKING WATER
STATE LOAN FUNDS
AS OF September 30, 2020

	5235	5240	
	Loan	Interest	
	Funds	(use for Grants)	Total
Cash:	\$15,450,064	\$2,653,790	\$18,103,853
Less:			
Loans & Grants authorized but not yet closed (schedule attached)	(7,184,000)	(2,146,505)	(9,330,505)
Loans & Grants closed but not fully disbursed (schedule attached)	(1,000,000)	0	(1,000,000)
Proposed loans & grants	(100,000)	0	(100,000)
Administrative quarterly charge for entire year	(1,018,500)		(1,018,500)
Appropriation to DDW	0		0
FY 2020 Federal SRF 20% match	0		0
FY 2021 Federal SRF 20% match	(2,202,200)		(2,202,200)
	3,945,364	507,285	4,452,648
Projected repayments during the next twelve months			
Thru 10-01-2021			
Principal	2,830,400		2,830,400
Interest		686,209	686,209
Projected annual investment earnings on invested cash balance		96,000	96,000
Sales Tax allocation thru Oct-01-2021	3,587,500		3,587,500
Total	\$10,363,264	\$1,289,493	\$11,652,757
* All interest is added to the Hardship Fee account.			

Agenda Item

8(B)

Project Priority List
Presented to the Drinking Water Board
November 3, 2020

**DRINKING WATER BOARD
PACKET FOR PROJECT PRIORITY LIST**

There is one new project being added to the project priority list

Moroni City is being added to the Project Priority List with 35.3 points. Their project consists of a new well and meter upgrades.

FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board approves the updated Project Priority List.

September 30, 2020

Utah Federal SRF Program

Project Priority List

Authorized

Total Unmet Needs:

\$681,749,602

Total Needs, incl. Recent funding

\$608,158,482

\$371,816,465

	date	type	%Green	Priority Points	System Name	County	Pop.	ProjectTitle	Project Total	Request DWB	Funds Authorized
N				35.3	Moroni City	Sanpete		New well and improvements	\$3,535,000.00	\$ 3,535,000	
N				12.9	Provo City	Utah		2 pump stations and pipeline for aquifer storage and recovery	\$18,020,000.00	\$ 7,388,000	

A				31.6	Virgin Town	washington	596	New tank and distribution lines	\$1,200,000	\$800,000	\$800,000
A				27.5	Sigurd Town	Sevier		Spring redevelopment, tank, chlorinator	\$2,120,101	\$2,020,101	\$2,300,000
A				25	Greenwich	Piute	67	Chlorination building	\$130,000	\$130,000	\$130,000
A				16.7	Willow Creek	Box Elder	260	Generator, mixer, meters	\$123,000	\$123,000	\$123,000
A				11.4	Spring Creek Water Users	Iron		Meter replacement	\$57,947	\$57,947	\$57,974
A				7	Genola	Utah	1,500	Tank and well	\$2,849,400	\$2,849,400	\$2,849,400
A				4.7	Hyde Park City	Cache		2 MG tank, trans & dist line, booster pump	\$5,994,000	\$5,000,000	\$5,000,000

N = New Application

A = Authorized

P = Potential Project- no application

E= Energy Efficiency

W= Water Efficiency

G= Green Infrastructure

I= Environmentally Innovative

EMERGENCY FUNDING



Agenda Item

8(C)(i)(a)

**DRINKING WATER BOARD
BOARD PACKET FOR PLANNING LOAN**

APPLICANT’S REQUEST:

Wallsburg Town is requesting funding for a water master plan. The total amount of estimated funding needed is \$100,000 and the District is requesting the full amount from the Drinking Water Board.

STAFF COMMENTS:

The local MAGI for Wallsburg is \$51,700, which is 108% of the State MAGI and the current average water bill is \$43.75/ERC. Their after project water bill at a full loan would increase to \$53.49/ERC, which is 1.24% of the local MAGI. The following funding options were evaluated:

	Total Funding	Grant	Loan	Term	Interest Rate	Water Bill	% Local MAGI
Option 1	\$100,000	\$0	\$100,000	10 yrs	*2.63%	\$53.84	1.25%
Option 2	\$100,000	\$0	\$100,000	10 yrs	1.89%	\$53.49	1.24%
Option 3	\$100,000	\$0	\$100,000	10 yrs	0%	\$52.63	1.22%

* Market Rate (RBBI)

FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board authorize a loan of \$100,000 at 1.89% interest for 10 years to Wallsburg Town.

APPLICANT'S LOCATION:

Wallsburg is located in Wasatch County, approximately 12 miles south of Heber City.

MAP OF APPLICANT'S LOCATION:



PROJECT DESCRIPTION:

Wallsburg Town is requesting financial assistance to complete a water Master Plan. The town has no fire flows and inadequate sources. The master plan will look at improving fire flow, options to improve sources, and options to develop existing water rights. The Master Plan will also examine the existing water treatment facility, water storage facilities, and transmission and distribution lines to determine if these are adequate or need to be expanded or modified. The Town is eager to complete a Master Plan so they can identify any problems with the system now and start the process of making improvements and resolving issues, rather than waiting until there is a serious problem to take action.

POPULATION GROWTH:

The population of Wallsburg has increased 64% since 2010. Projected population and connections for Wallsburg over the next 20 years is based on a 2.6% annual growth rate estimated by the town’s consulting engineer:

Year	Population	Connections
2020	425	119
2030	573	160
2040	710	200

IMPLEMENTATION SCHEDULE:

DWB Authorization	November 2020
Completed Master Plan	July 2021

COST ESTIMATE:

Legal/Bonding	\$5,000
Engineering – Planning	<u>\$95,000</u>
Total Project Cost	\$100,000

COST ALLOCATION:

The anticipated cost allocation for the project is shown below.

<u>Funding Source</u>	<u>Cost Sharing</u>	<u>Percent of Project</u>
DWB Loan (1.89%, 10 yrs)	<u>\$100,000</u>	<u>100%</u>
Total Amount	\$100,000	100%

IPS SUMMARY:

Code	Description	Physical Facilities	Quality & Monitoring	Significant Deficiency Violations
M006	LACKS WRITTEN RECORDS OF CCC ACTIVITIES	15		
M007	CCC-LACKS ON-GOING ENFORCEMENT IMPLEMENTATION	15		
Total		30		

APPLICANT:

Wallsburg Town
PO Box 52
Wallsburg, UT 84082
Telephone: (435) 671-3265
clintallen2016@yahoo.com

PRESIDING OFFICIAL &
CONTACT PERSON:

Celeni Richins
Mayor
PO Box 52
Wallsburg, UT 84082
Telephone: (435) 654-8608
CeleniRichins@gmail.com

CONSULTING ENGINEER:

Troy Ostler
CIVCO Engineering Inc.
PO Box 1758
Vernal, UT 84079
(435) 789-5448
troyostler@civcoengineering.com

TREASURER/RECORDER:

Rylee Allen
Telephone: (435) 654-8437
Rylee_B@hotmail.com

DRINKING WATER BOARD FINANCIAL ASSISTANCE EVALUATION

SYSTEM NAME: Wallsburg Town
 COUNTY: Wasatch
 PROJECT DESCRIPTION: Master Plan

FUNDING SOURCE: State SRF

100 % Loan & 0 % Grant

ESTIMATED POPULATION:	425	NO. OF CONNECTIONS:	119 *	SYSTEM RATING:	APPROVED
CURRENT AVG WATER BILL:	\$43.75 *			PROJECT TOTAL:	\$100,000
CURRENT % OF AGI:	1.02%	FINANCIAL PTS:	32	LOAN AMOUNT:	\$100,000
ESTIMATED MEDIAN AGI:	\$51,700			GRANT AMOUNT:	\$0
STATE AGI:	\$48,000			TOTAL REQUEST:	\$100,000
SYSTEM % OF STATE AGI:	108%				

	@ ZERO % RATE	@ RBBI MKT RATE		AFTER REPAYMENT PENALTY & POINTS
SYSTEM	0%	2.63%		1.89%
ASSUMED LENGTH OF DEBT, YRS:	10	10		10
ASSUMED NET EFFECTIVE INT. RATE:	0.00%	2.63%		1.89%
REQUIRED DEBT SERVICE:	\$10,000.00	\$11,502.76		\$11,068.68
*PARTIAL COVERAGE (15%):	\$0.00	\$0.00		\$0.00
*ADD. COVERAGE AND RESERVE (10%):	\$1,000.00	\$1,150.28		\$1,106.87
ANNUAL NEW DEBT PER CONNECTION:	\$92.44	\$106.33		\$102.32
O & M + FUNDED DEPRECIATION:	\$60,626.00	\$60,626.00		\$60,626.00
OTHER DEBT + COVERAGE:	\$0.00	\$0.00		\$0.00
REPLACEMENT RESERVE ACCOUNT:	\$3,531.30	\$3,606.44		\$3,584.73
ANNUAL EXPENSES PER CONNECTION:	\$539.14	\$539.77		\$539.59
TOTAL SYSTEM EXPENSES	\$75,157.30	\$76,885.48		\$76,386.28
TAX REVENUE:	\$0.00	\$0.00		\$0.00
RESIDENCE				
MONTHLY NEEDED WATER BILL:	\$52.63	\$53.84		\$53.49
% OF ADJUSTED GROSS INCOME:	1.22%	1.25%		1.24%

\$0.00

Agenda Item

8(C)(i)(b)

DRINKING WATER BOARD
BOARD PACKET FOR CONSTRUCTION ASSISTANCE

APPLICANT'S REQUEST:

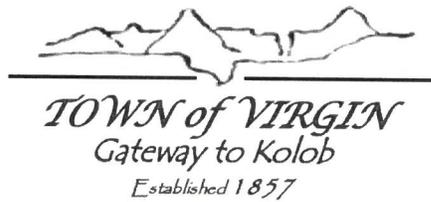
On January 15, 2019, Virgin Town was authorized a grant of \$400,000 and a loan of \$400,000 to construct a new tank and distribution lines.

STAFF COMMENTS:

On October 22, 2020, staff received a letter from Virgin Town Mayor, Matthew Spendlove and Town Engineer, Rod Mills indicating the project has run into substantial delays and change in scope. They have also spent some of their pledged contribution on other, more pressing system improvements. They will continue to work on securing land needed for the new tank and come back the Drinking Water Board with an updated project proposal and request at a later time.

STAFF RECOMMENDATION:

The Drinking Water Board de-authorize a **grant of \$400,000 and a loan of \$400,000 at 0% interest for 20 years** to Virgin Town.



Michael Grange
% Skylar Sieber
Utah Division of Drinking Water
SRF Project Manager | Technical Assistance Section
P: (801) 536-4097

September 29, 2020

RE Board Authorization for Virgin East Tank Project

Dear Michael,

Virgin Town is grateful for the funding authorization to construct our East Tank and pipeline project. We have regrettably run into substantial delays in obtaining the land from the BLM.

We are currently working on the environmental study in cooperation with the BLM. This study, due to sensitive plants, cannot be completed until next late Spring (May). We knew the BLM process would be lengthy.

Our current plan is to use some of the money that we pledged to the funding package toward some of the more urgent project needs including transmission pipeline work and town wide meter replacements. We are also looking at some system improvements that are not included in the DDW authorization. The most significant project is to replace the master meter vault and equipment that connects the Virgin Town distribution System with the Washington County water Conservancy District system.

In ongoing discussion with your staff we recognize that we are significantly beyond the normal time frames for closing on our funding allocation.

We concur with your Staff recommendation to De-Authorize the funding to allow us the time needed to secure the land.

We will come back to the board for a new authorization as soon as possible. Our biggest concern is we will have already spent our pledged money on some of the more pressing system improvements and that a new funding request will not look as favorable from the local contribution perspective. In the current authorization Virgin has pledged \$400,000.00 and the board graciously matched that with grant and supplemented with loan for the total project.

Thank you for your continued support and guidance.

Sincerely,

Rod Mills, P.E.
Town Engineer

Matthew Spendlove
Mayor, Virgin Town

114 S. Mill Street

P.O. Box 790008, Virgin, UT 84779

Phone (435) 635-4695

email: clerk@virgin.utah.gov website: virgin.utah.org

Fax (435) 635-0265

Agenda Item

8(C)(ii)(a)

**DRINKING WATER BOARD
BOARD PACKET FOR CONSTRUCTION LOAN**

APPLICANT’S REQUEST:

Moroni City is requesting financial assistance to construct a new well and well house, a 500k gallon storage tank and overflow line, PRV station and pumplines, and make several improvements to the existing SCADA and distribution system. This project scored 35.3 points on the Project Priority List.

The total amount of estimated funding needed is **\$3,535,000** and the city is requesting the full amount from the Drinking Water Board.

STAFF COMMENTS:

The MAGI for Moroni City is \$36,500, which is 76% of the State MAGI and the current average water bill is \$60.16/ERC. Their after project water bill at a 20-year loan would be \$98.04/ERC, which is 3.22% of the local MAGI.

Based on the system % of State MAGI and average monthly water bill, the city qualifies to be considered for additional subsidy. The following options were evaluated:

	Total Funding	Principal Forgiveness	Loan	Term	HGA	Water Bill	% Local MAGI
Option 1	\$3,535,000	\$0	\$3,535,000	20 yrs	1.9%	\$98.04	3.22%
Option 2	\$3,535,000	\$0	\$3,535,000	30 yrs	2.1%	\$87.20	2.87%
Option 3	\$3,535,000	\$1,050,000	\$2,485,000	30 yrs	2.1%	\$77.68	2.55%
Option 4	\$3,535,000	\$1,050,000	\$2,485,000	30 yrs	1.0%	\$74.43	2.45%

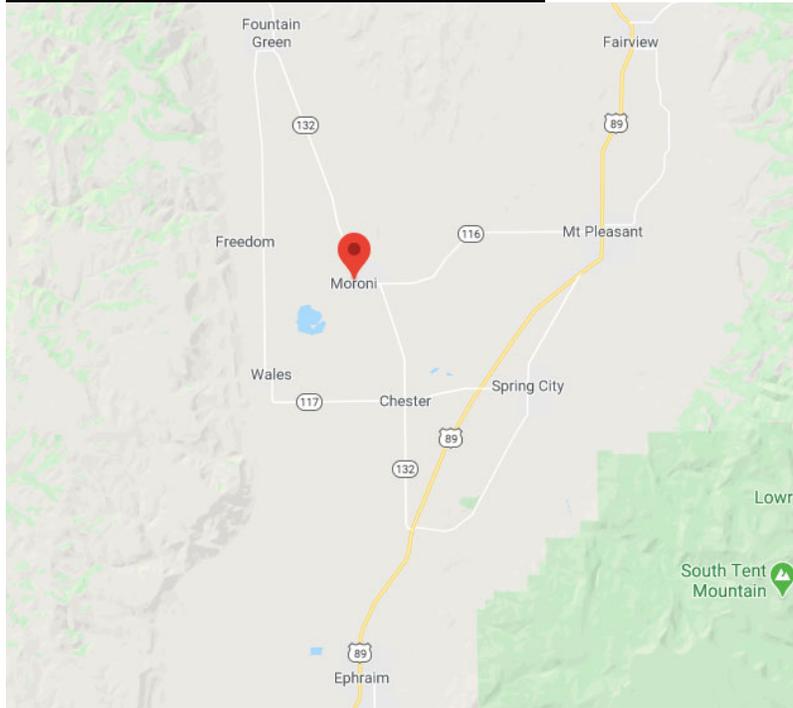
FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board authorize a loan of \$3,535,000 with \$1,050,000 in Principal Forgiveness at a 1.0% Hardship Grant Assessment fee for 30 years to Moroni City, for a repayable amount of \$2,485,000. Additionally, the Board authorize a release of up to \$200,000 from Principal Forgiveness for engineering design. Conditions include that they resolve all issues on their compliance report.

APPLICANT'S LOCATION:

Moroni City is located in Sanpete County, approximately 13 miles north of Ephraim.

MAP OF APPLICANT'S LOCATION:



PROJECT DESCRIPTION:

In the spring of 2020, Moroni City's well #3 went down suddenly and they had to start relying on well #2, which contains high nitrate levels - greater than safely allowed. The city quickly notified users and purchased bottled water for those who were at risk. The city contracted with Sunrise Engineering to complete a source feasibility study and to draft and submit a blending plan to DDW so the city could safely continue to use well #2 by blending with well #3. As a result of the source study, it was determined that the best alternative for the city to move forward is to build a new well (compared to treatment) and at the same time construct some additional improvements identified in their culinary water master plan. The new well also addresses the need for additional source capacity.

The proposed improvements for Moroni City include drilling a new culinary water well and constructing a new well house; constructing a new 500k gallon reinforced concrete storage tank with all the piping and appurtenances necessary for proper operation; and installing approximately 6,300' of PVC piping to serve as a supply line from the new and existing wells to the new storage tank. Approximately 3,600' of PVC or HDPE piping will serve as an overflow line from the new 500k gallon storage tank to mitigate flood risk to homes below the tank. The new tank will add 300k gallons of storage by replacing the existing 200k gallon storage tank and resolve the issue of low pressures in some areas of the distribution system. In addition, new inline gate valves and fire hydrants will be installed in various locations of the water distribution system to either replace existing

valves or hydrants that have been deemed non-operational or additional valves and hydrants to improve and enhance system optimization. New SCADA system instrumentation and controls along with flow meters for the new improvements are necessary for proper functionality of the system and are included as proposed improvements in the project. A new pressure reducing valve station will be installed in order to regulate system pressures and to allow for the city to manage the system in an efficient and safe manner.

POPULATION GROWTH:

Projected population and number of connections for Moroni City is based on a 2% growth rate estimated in their current Water Master Plan:

Year	Population	Connections
2020	1,500	520
2030	1,825	676
2040	2,225	833

IMPLEMENTATION SCHEDULE:

DWB Authorization	November 2020
Complete Design	December 2021
Plan Approval	January 2022
Advertise for Bids	January 2022
Loan Closing	March 2022
Begin Construction	March 2022
Complete Construction	October 2022

COST ESTIMATE:

Legal/Bonding	\$20,000	
Environmental	\$20,000	
Engineering – Design/Bidding	\$200,000	} 14.14%
Engineering – CMS	\$294,835	
Construction – New Well	\$495,000	
Construction – Well house	\$364,000	
Construction – Storage Tank	\$660,000	
Construction – Distribution line, overflow line, well line improvement	\$909,165	
Construction – SCADA, metering	\$87,000	
Land Acquisition	\$25,000	
Contingency	\$425,000	
DDW Loan Origination Fee	\$35,000	
Total Project Cost	\$3,535,000	

COST ALLOCATION:

The anticipated cost allocation for the project is shown below.

<u>Funding Source</u>	<u>Cost Sharing</u>	<u>Percent of Project</u>
DWB Principal Forgiveness	\$1,050,000	30%
DWB Loan (1%, 30 yrs)	<u>\$2,485,000</u>	<u>70%</u>
Total Amount	\$3,535,000	100%

IPS SUMMARY:

Code	Description	Physical Facilities	Quality & Monitoring	Significant Deficiency Violations
SP04	ACTIVE SOURCE LACKS APPROVED UPDATES TO DWSP PLAN (#2 EAST Well)	5		
SP04	ACTIVE SOURCE LACKS APPROVED UPDATES TO DWSP PLAN (#3 WEST Well)	5		
Total		10		

APPLICANT:

Moroni City
80 South 200 West
Moroni, Utah 84646
Telephone: (435) 436-8359
recorder@cut.net

PRESIDING OFFICIAL or
CONTACT PERSON:

Paul Bailey
Mayor
80 South 200 West
Moroni, Utah 84646
Telephone: (435) 436-8359

CONSULTING ENGINEER:

Robert Worley
Sunrise Engineering
25 E 500 N
Fillmore, Utah 84631
(435) 743-6151
rworley@sunrise-eng.com

BOND ATTORNEY

Richard Chamberlain
Chamberlain Associates
225 North 100 East
Richfield, UT 84701
(801) 436-4461
rchamberlain13@gmail.com

TREASURER/RECORDER:

Carol Haskins
Telephone: (435) 436-8359
recorder@cut.net

DRINKING WATER BOARD FINANCIAL ASSISTANCE EVALUATION

SYSTEM NAME: Moroni City

FUNDING SOURCE: Federal SRF

COUNTY: Utah

PROJECT DESCRIPTION: New well, storage tank, and line improvements

70 % Loan & 30 % P.F.

ESTIMATED POPULATION:	1,500	NO. OF CONNECTIONS:	520 *	SYSTEM RATING:	APPROVED
CURRENT AVG WATER BILL:	\$60.16 *			PROJECT TOTAL:	\$3,535,000
CURRENT % OF AGI:	1.98%	FINANCIAL PTS:	35	LOAN AMOUNT:	\$2,485,000
ESTIMATED MEDIAN AGI:	\$36,500			PRINC. FORGIVE.:	\$1,050,000
STATE AGI:	\$48,000			TOTAL REQUEST:	\$3,535,000
SYSTEM % OF STATE AGI:	76%				

	@ ZERO % RATE	@ RBBI MKT RATE	AFTER REPAYMENT PENALTY & POINTS
SYSTEM	0%	2.63%	1.00%
ASSUMED LENGTH OF DEBT, YRS:	30	30	30
ASSUMED NET EFFECTIVE INT. RATE:	0.00%	2.63%	1.00%
REQUIRED DEBT SERVICE:	\$82,833.33	\$120,794.95	\$96,289.06
*PARTIAL COVERAGE (15%):	\$0.00	\$18,119.24	\$14,443.36
*ADD. COVERAGE AND RESERVE (10%):	\$8,283.33	\$12,079.49	\$9,628.91
ANNUAL NEW DEBT PER CONNECTION:	\$175.22	\$290.37	\$231.46
O & M + FUNDED DEPRECIATION:	\$143,876.00	\$143,876.00	\$143,876.00
OTHER DEBT + COVERAGE:	\$51,967.50	\$51,967.50	\$51,967.50
REPLACEMENT RESERVE ACCOUNT:	\$13,414.17	\$0.00	\$0.00
ANNUAL EXPENSES PER CONNECTION:	\$402.42	\$376.62	\$376.62
TOTAL SYSTEM EXPENSES	\$300,374.33	\$346,837.19	\$316,204.83
TAX REVENUE:	\$0.00	\$0.00	\$0.00
RESIDENCE			
MONTHLY NEEDED WATER BILL:	\$71.90	\$79.34	\$74.43
% OF ADJUSTED GROSS INCOME:	2.36%	2.61%	2.45%

\$0.00

Agenda Item

8(C)(ii)(b)

**DRINKING WATER BOARD
BOARD PACKET FOR CONSTRUCTION LOAN**

APPLICANT’S REQUEST:

Provo City is requesting funding to construct two pump stations and a pipeline running east from the Provo River to Rock Canyon. The first pump station will be located on the Provo River and the second pump station will be located along the Timpanogos Canal. Water will be pumped from these two sources to Rock Canyon for aquifer storage and recovery. They scored 12.9 points on the Project Priority List.

The total estimated cost of the project is \$20,650,000. The City is contributing \$2,512,000. On October 8, 2020 the Board of Water Resources authorized a loan of \$10,000,000 at 1.0% interest for 20 years. They have also applied for a \$750,000 WaterSMART grant from the Bureau of Reclamation. The remaining amount Provo is requesting from the Drinking Water Board is **\$7,388,000**.

STAFF COMMENTS:

The local MAGI for Provo is \$31,600, which is 66% of the State MAGI and the current average water bill is \$39.99/ERC. If DWB funded the entire \$18M project at full loan, the city’s after project water bill would be \$31.30/ERC, which is 1.19% of the local MAGI. The after project water bill for a \$7.38M full loan is \$29.73/ERC or 1.13% of their local MAGI. Based on the system’s % of State MAGI, Provo City qualifies to be considered for additional subsidy.

The following options were evaluated:

	Total Funding	Grant	Loan	Term	Interest Rate	Water Bill	% Local MAGI
Option 1	\$7,388,000	\$0	\$7,388,000	20 yrs	1.69%	\$29.73	1.13%
Option 2	\$7,388,000	\$0	\$7,388,000	20 yrs	1.0%	\$29.64	1.13%
Option3	\$7,388,000	\$738,000	\$6,650,000	20 yrs	1.0%	\$29.51	1.12%

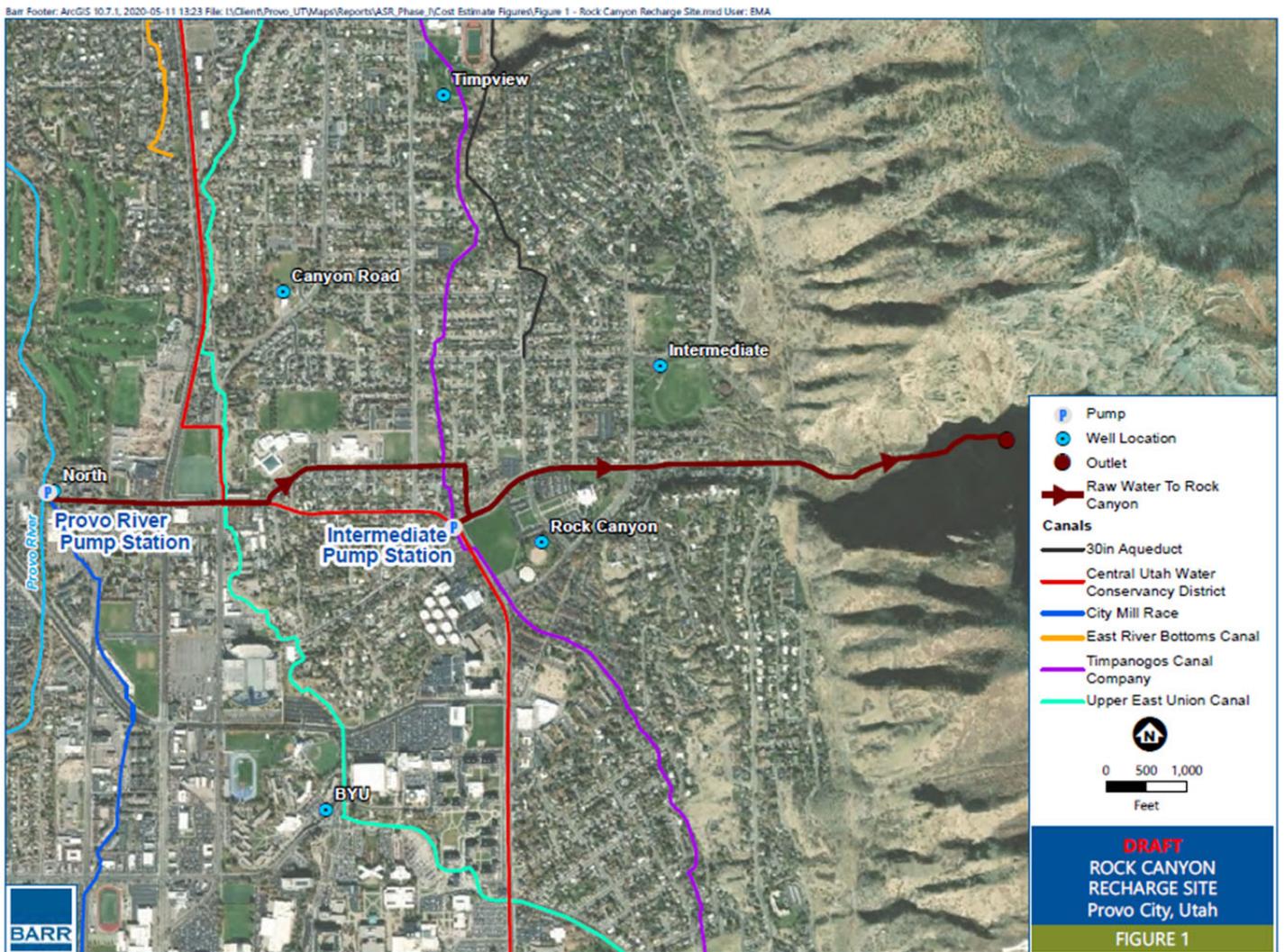
FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board authorize a loan of \$7,388,000 at 1.0% interest for 20 years to Provo City. Conditions include that they resolve all issues on their compliance report.

APPLICANT'S LOCATION:

Provo City is located in Utah County and provides water to 29,435 equivalent residential connections.

MAP OF APPLICANT'S PROJECT:



PROJECT DESCRIPTION:

Provo, along with much of the Wasatch Front is experiencing rapid population growth. With population growth, comes an increase in water demand and a need to secure a long term sustainable water supply. During this time of growth, the aquifers beneath Provo, which are a key part of its water supply, have been declining for decades and have increased the impact of drought on the city. These conditions have led to the focus of implementing aquifer storage and recovery projects to provide drought resiliency and secure a long term regional groundwater supply. This project is the first of many that Provo aims to implement to achieve these goals.

POPULATION GROWTH:

Projected population and number of connections for Provo City is based on a 1.33% growth rate estimated by city:

Year	Population	Connections
2020	116,713	19,607
2030	138,905	23,336
2040	151,879	25,516

IMPLEMENTATION SCHEDULE:

DWB Authorization	September 2020
Complete Design	November 2020
DDW Plan Approval	December 2020
Advertise for Bids	January 2021
Loan Closing	February 2021
Begin Construction	March 2021
Complete Construction	September 2021

COST ESTIMATE:

Legal/Bonding	\$125,000	
Environmental Study	\$150,000	
Engineering – Design and CMS	\$2,500,000	= 12%
Construction – Transmission Line	\$7,370,000	
Construction – Pump Stations	\$5,850,000	
Construction – Mobilization, electrical upgrades, SCADA, traffic control	\$1,725,000	
Land Acquisition	\$600,000	
Contingency	\$2,330,000	
DDW Loan Origination Fee	<u>waived</u>	
Total Project Cost	\$20,650,000	

COST ALLOCATION:

The anticipated cost allocation for the project is shown below.

<u>Funding Source</u>	<u>Cost Sharing</u>	<u>Percent of Project</u>
Local Contribution	\$2,512,000	12%
DWB Loan (1%, 20 yrs)	\$7,388,000	36%
BWR Loan (1%, 20 yrs)	\$10,000,000	48%
BOR Grant	<u>\$750,000</u>	<u>4%</u>
Total Amount	\$18,020,000	100%

IPS SUMMARY:

Code	Description	Physical Facilities	Quality & Monitoring	Significant Deficiency Violations
TP011	CHLORINE ROOM AIR INLET NOT LOCATED NEAR CEILING THROUGH WALL LOUVERS (Provo Canyon Chlorinator)	15		
S024	NO CHECK VALVE ON WELL DISCHARGE PIPING (Rock Canyon Well)	5		
	Total	20		

APPLICANT:

Provo City Water Resources
1377 S 350 E
Provo, UT 84606
Telephone: (801) 852-6773
sjones@provo.utah.gov

PRESIDING OFFICIAL or
CONTACT PERSON:

Dave Decker
Public Works Director
1377 S 350 E
Provo, UT 84606
Telephone: (801) 852-6771
ddecker@provo.utah.gov

CONSULTING ENGINEER:

Jeff Davis
Barr Engineering Co.
170 S Main St
Salt Lake City, UT 84101
(801) 333-8420
Jdavis@barr.com

BOND ATTORNEY

Eric Hunter
Chapman and Cutler LLP
215 S State Street
Salt Lake City, UT 84111
(801) 536-1441
ehunter@chapman.com

TREASURER/RECORDER:

Amanda Ercanbrack
Telephone: (801) 852-6524
Aercanbrack@provo.org

DRINKING WATER BOARD FINANCIAL ASSISTANCE EVALUATION

SYSTEM NAME: Provo City

FUNDING SOURCE: Federal SRF

COUNTY: Utah

PROJECT DESCRIPTION: 2 pump stations and pipeline for aquifer storage and recovery

90 % Loan & 10 % P.F.

ESTIMATED POPULATION:	116,713	NO. OF CONNECTIONS:	29435 *	SYSTEM RATING:	APPROVED
CURRENT AVG WATER BILL:	\$39.99 *			PROJECT TOTAL:	\$18,020,000
CURRENT % OF AGI:	1.52%	FINANCIAL PTS:	47	LOAN AMOUNT:	\$6,650,500
ESTIMATED MEDIAN AGI:	\$31,600			PRINC. FORGIVE.:	\$738,000
STATE AGI:	\$48,000			TOTAL REQUEST:	\$7,388,500
SYSTEM % OF STATE AGI:	66%				

	@ ZERO % RATE	@ RBBI MKT RATE		AFTER REPAYMENT PENALTY & POINTS
SYSTEM	0%	2.63%		1.00%
ASSUMED LENGTH OF DEBT, YRS:	20	20		20
ASSUMED NET EFFECTIVE INT. RATE:	0.00%	2.63%		1.00%
REQUIRED DEBT SERVICE:	\$332,525.00	\$431,866.80		\$368,539.55
*PARTIAL COVERAGE (15%):	\$0.00	\$0.00		\$0.00
*ADD. COVERAGE AND RESERVE (10%):	\$33,252.50	\$43,186.68		\$36,853.96
ANNUAL NEW DEBT PER CONNECTION:	\$12.43	\$16.14		\$13.77
O & M + FUNDED DEPRECIATION:	\$8,353,146.00	\$8,353,146.00		\$8,353,146.00
OTHER DEBT + COVERAGE:	\$983,781.25	\$983,781.25		\$983,781.25
REPLACEMENT RESERVE ACCOUNT:	\$584,252.60	\$589,219.69		\$586,053.33
ANNUAL EXPENSES PER CONNECTION:	\$337.05	\$337.22		\$337.12
TOTAL SYSTEM EXPENSES	\$10,286,957.35	\$10,401,200.42		\$10,328,374.08
TAX REVENUE:	\$0.00	\$0.00		\$0.00
RESIDENCE				
MONTHLY NEEDED WATER BILL:	\$29.39	\$29.71		\$29.51
% OF ADJUSTED GROSS INCOME:	1.12%	1.13%		1.12%

\$0.00

Agenda Item

9

DRINKING WATER BOARD PACKET
Rural Water Association Report

Table of Contents

Terry Smith – Compliance Specialist.....2

Janell Braithwaite – Management Technician.....4

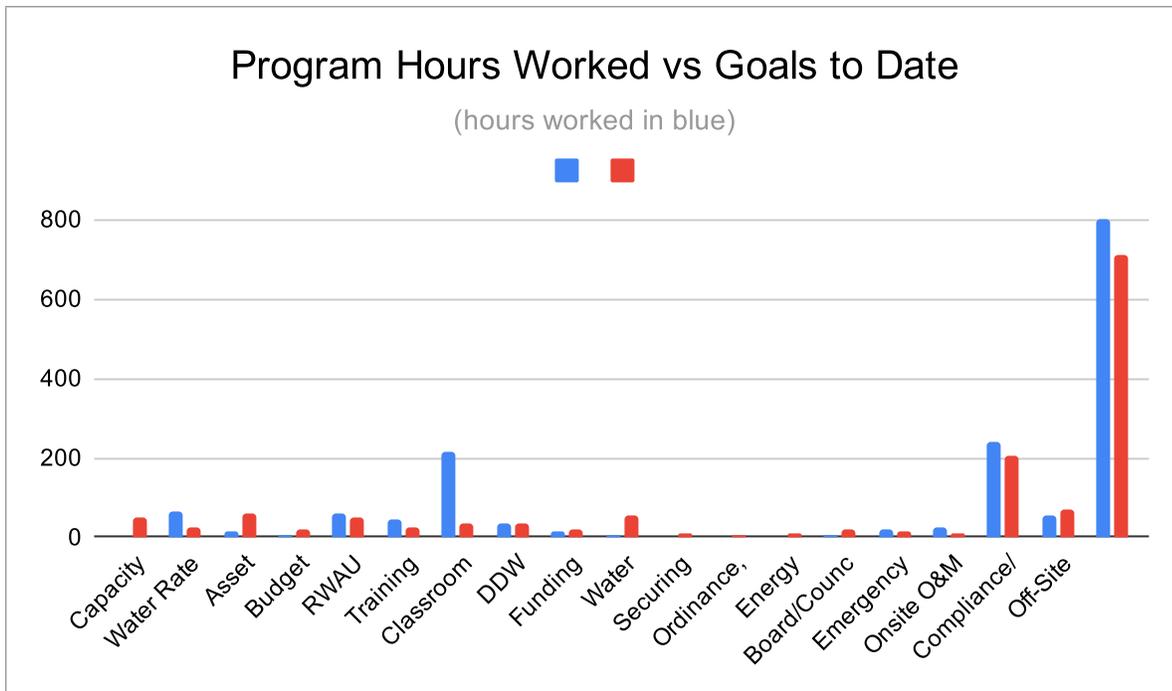
Curt Ludvigson – Management Technician.....6

Rural Water Association - DWB Report

Report Period: September, 2020

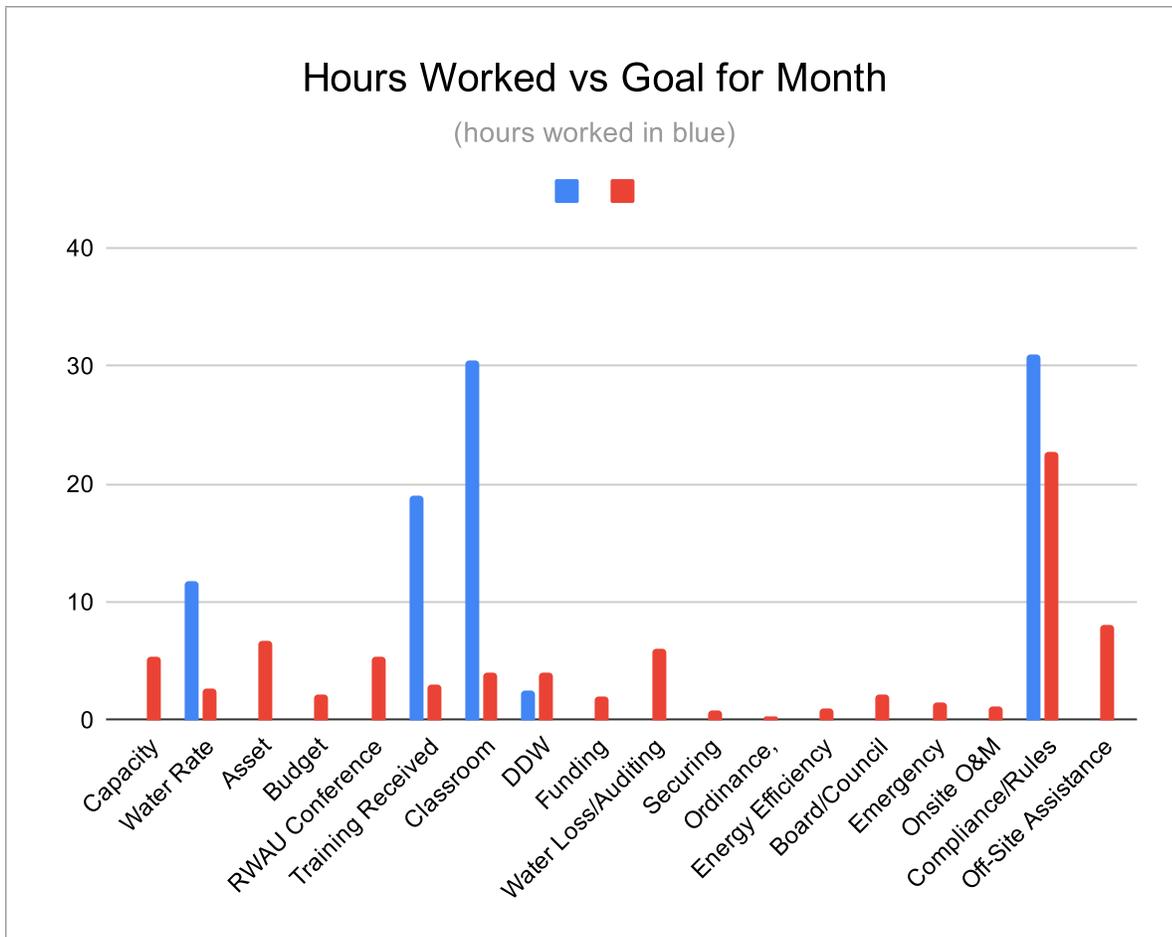
Terry Smith - Compliance Specialist

Contract Goal Titles	Report Period Hours:	Program Hours to Date:	Program Goals:
Capacity Development/Master Planning	0.0	48.0	64.0
Water Rate Development/Analysis	11.8	24.0	11.8
Asset Management/Evaluation	0.0	60.0	80.0
Budget Planning/Evaluation	0.0	19.5	26.0
RWAU Conference	0.0	48.0	64.0
Training Received	19.0	27.0	36.0
Classroom Instruction/Training	30.5	36.0	48.0
DDW Interaction/Meetings/Reports	2.5	36.0	48.0
Funding Procurement	0.0	18.0	24.0
Water Loss/Auditing	0.0	54.0	72.0
Securing Engineering	0.0	7.5	10.0
Ordinance, Resolutions, By-Laws Development	0.0	3.0	4.0
Energy Efficiency Study	0.0	9.0	12.0
Board/Council Training	0.0	19.5	26.0
Emergency Response	0.0	13.5	18.0
Onsite O&M Training	0.0	10.5	14.0
Compliance/Rules Assistance	31.0	204.0	272.0
Off-Site Assistance	0.0	72.0	96.0
Totals:	94.75	710	926



Report Period: September, 2020
Notable Assistance & Work Performed

System	Description:
PINON FOREST SSD	Assisting Pinon Forrest - compliance
PAROWAN CITY	SP update assistance - Parowan City WS001
WILDWOOD WATER (29124)	Compliance assistance - WTTC
WINCHESTER HILLS WATER	Proctor CC Admin test
ALLARD RANCH WC (11067)	Helping with SP update, CC, WTTC, etc.
ESCALANTE TOWN (09004)	Working with Escalante city - impact fee rule
SAN JUAN SPANISH VLY (19080)	Assisting with sampling plan, CCR & Cross Connection planning
	New presentation creation - Compliance A-Z
COALVILLE CITY	Teaching - Compliance A-Z, onsite/online
CLARK BENCH (13060)	Working with Clark Bench - WTTC
ROCKVILLE PIPELINE CO	Phone call - water shortage & rates policy
	Working on CC presentation for system managers (mayor, council)

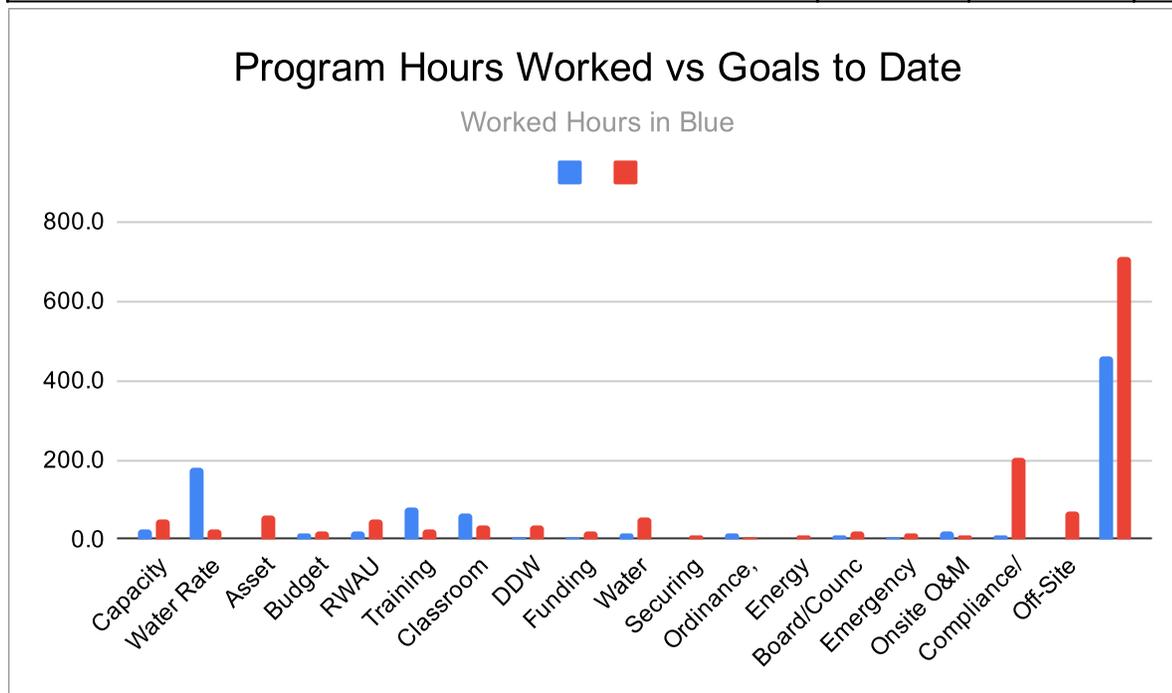


Rural Water Association - DWB Report

Report Period: September, 2020

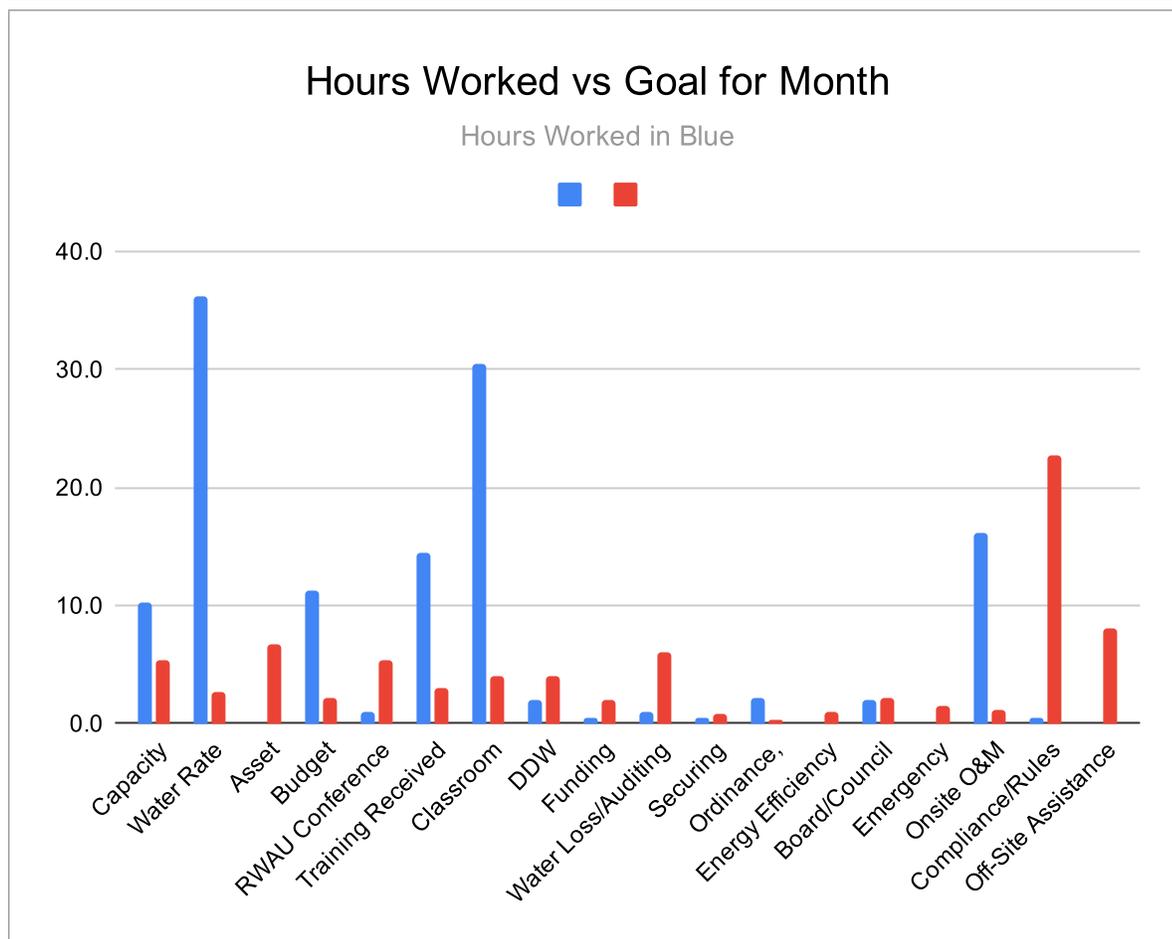
Janell Braithwaite - Management Technician

Contract Goal Titles	Report Period Hours:	Program Hours to Date:	Program Goals:
Capacity Development/Master Planning	10.25	48	64
Water Rate Development/Analysis	36.25	24	32
Asset Management/Evaluation	0.00	60	80
Budget Planning/Evaluation	11.25	20	26
RWAU Conference	1.00	48	64
Training Received	14.50	27	36
Classroom Instruction/Training	30.50	36	48
DDW Interaction/Meetings/Reports	2.00	36	48
Funding Procurement	0.50	18	24
Water Loss/Auditing	1.00	54	72
Securing Engineering	0.50	8	10
Ordinance, Resolutions, By-Laws Development	2.25	3	4
Energy Efficiency Study	0.00	9	12
Board/Council Training	2.00	20	26
Emergency Response	0.00	14	18
Onsite O&M Training	16.25	11	14
Compliance/Rules Assistance	0.50	204	272
Off-Site Assistance	0.00	72	96
Total:	128.75	710	946



Report Period: September, 2020
Notable Assistance & Work Performed

System Name:	Description:
MAYFIELD TOWN	Gathered information to start water rate study for Mayfield as
WOODLAND HILLS CITY	Discuss resolution and BRIC grant that is available
DUTCH JOHN WATER & SEWER	Review budget information and data given for finance procurement
WOODLAND HILLS CITY	Woodland Hills city council meeting to adopt new water rates
HIGH VALLEY WATER CO	Attend High Valley Water Co. board meeting
OAKLEY CITY	Attend Oakley city council meeting-discuss Master Plan and Capacity
SIGURD TOWN WATER	Called Mayor Alvey of Sigurd to find out what they found on their
SIGURD TOWN WATER	Review Sigurd water loss information
	RWAU training in Moroni
MAYFIELD TOWN	Meeti w/Mayfield Town Mayor, Clerk, Water Operator and Engineer
	Teach EPA class at Coalville
	Teach Water Conservation Class, Pricing and Budgeting, Watering
DUTCH JOHN WATER & SEWER	Contact Trevor Brooksby with Dutch John system to get more
DUTCH JOHN WATER & SEWER	Contacted Jessica to see if she could help Dutch John finish up their
MAYFIELD TOWN	Reviewed Mayfield's information sent for three year comparison to

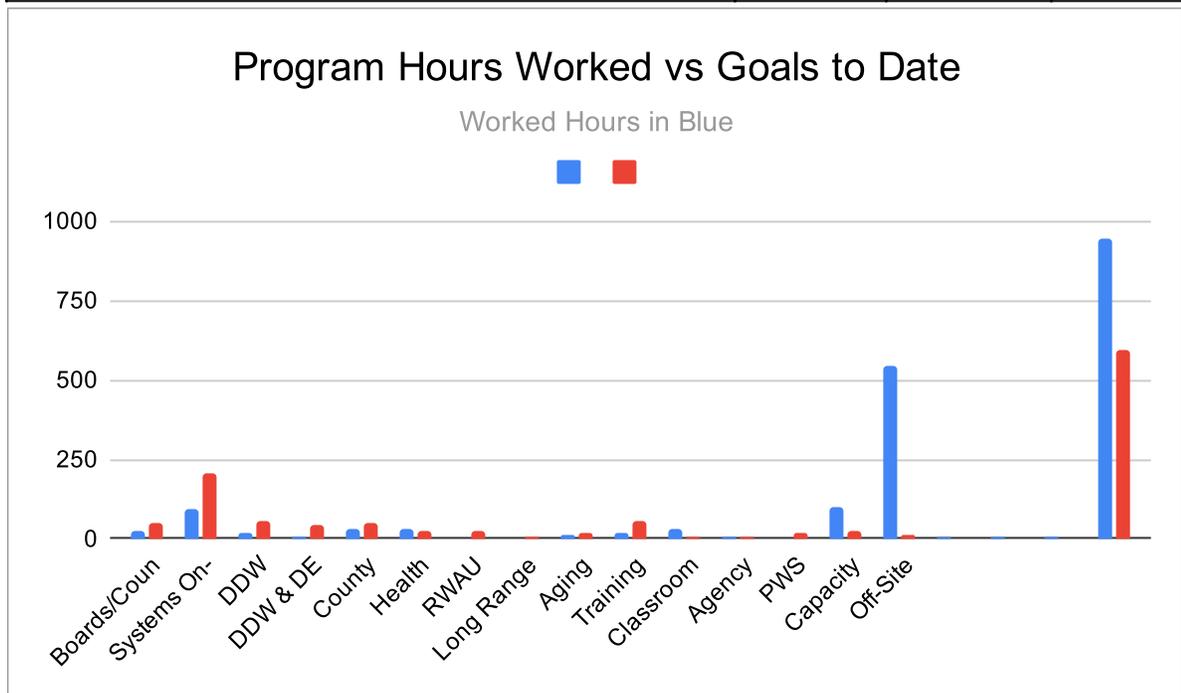


Rural Water Association - DWB Report

Report Period: September, 2020

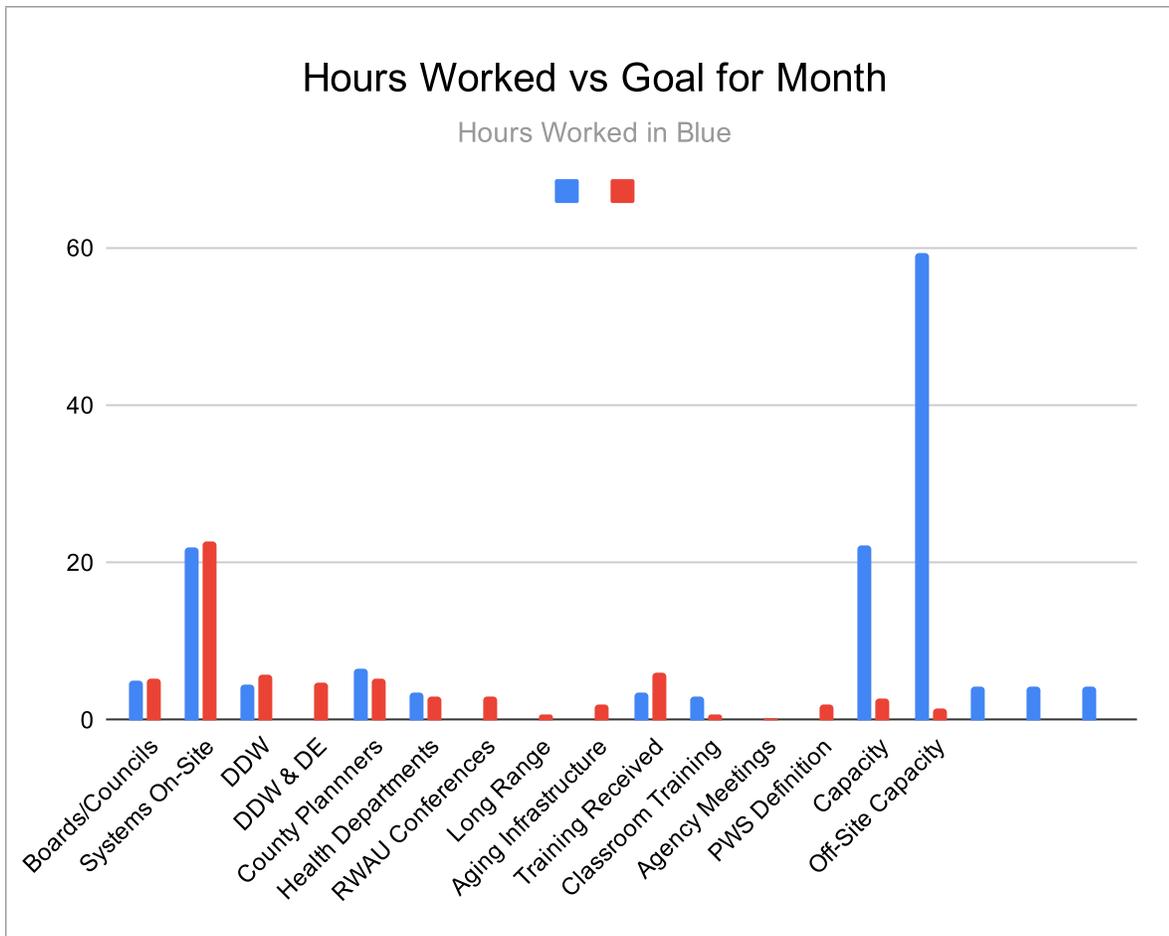
Curt Ludvigson - Management Technician

Contract Goal Titles	Report Period Hours:	Program Hours to Date:	Program Goals:
Boards/Councils	5.00	48.00	64
Systems On-Site	22.00	204.00	272
DDW Interaction/Meetings	4.50	53.25	71
DDW & DE	0.00	42.00	56
County Planners	6.50	48.00	64
Health Departments	3.50	27.00	36
RWAU Conferences	0.00	27.00	36
Long Range Planning	0.00	7.50	10
Aging Infrastructure Planning	0.00	18.00	24
Training Received	3.50	54.00	72
Classroom Training	3.00	7.50	10
Agency Meetings	0.00	3.00	4
PWS Definition Training	0.00	18.00	24
Capacity Development Planning	22.25	24.00	32
Off-Site Capacity Development	59.50	13.50	18
Total:	142	595	793



Report Period: September, 2020
 Notable Assistance & Work Performed

System Name:	Description:
	Drinking Water Board Meeting
SIGURD TOWN WATER	Working on RFP for Sigurd



Agenda Item

10(A)

NOVEMBER 2020 ENFORCEMENT REPORT

PWS ID	PWS Name	PWS Type	Pop Served	IPS Pts	Rating	Rating Date
Finalized AO						
UTAH18028	SANDY CITY	Community	99750	2	Approved	03/11/1980
UTAH25023	BRICKERHAVEN	Non-Community	150	55	Not Approved	9/5/2019
UTAH11043	OLD MEADOWS	Community	48	285	Not Approved	04/18/2017
Corrective Action Systems						
UTAH02078	M & J TRAILER HOME COMMUNITY	Community	27	260	Not Approved	8/20/2018
UTAH26026	BRYANTS FORK SUMMER HOMES	Non-Community	50	0	Corrective Action	6/11/2019
UTAH22001	CLUFFWARD PIPELINE	Community	188	100	Corrective Action	9/30/2019
UTAH07061	VALLE DEL PADRES SUBDIV	Non-Transient	98	75	Corrective Action	11/13/2019
UTAH26074	SOAPSTONE SUMMER HOMES	Non-Community	110	55	Corrective Action	5/22/2020
UTAH02003	BOTHWELL	Community	360	55	Corrective Action	5/22/2020
UTAH02031	GIRLS HOME	Non-Community	300	405	Corrective Action	5/27/2020
UTAH29086	PINE VIEW HOMEOWNERS	Community	105	115	Corrective Action	5/28/2020
UTAH26064	MILL HOLLOW	Non-Community	220	95	Corrective Action	6/9/2020
UTAH26050	BACK FORTY RANCH HOUSE	Non-Community	70	5	Corrective Action	6/15/2020
UTAH25082	TIE FORK REST AREA	Non-Community	301	95	Corrective Action	6/16/2020
UTAH09001	ANTIMONY TOWN	Community	135	35	Corrective Action	6/24/2020
UTAH26033	DEER CREEK PARK LLC	Non-Community	150	415	Corrective Action	7/8/2020
UTAH29009	NORDIC MOUNTAIN	Community	509	180	Corrective Action	7/8/2020
UTAH27051	ZION CANYON	Community	3380	0	Corrective Action	7/8/2020
UTAH27052	ZION CANYON -EAST GATE	Non-Community	27	5	Corrective Action	7/8/2020
UTAH27093	BIG PLAINS CANAAN RANCH	Community	56	110	Corrective Action	7/31/2020
UTAH01015	GREENVILLE WARD	Non-Community	100	60	Corrective Action	8/11/2020
UTAH25179	RIGTRUP EGG FARM	Non-Transient	35	50	Corrective Action	8/11/2020
UTAH02062	WILLOW CREEK WATER	Community	175	75	Corrective Action	8/11/2020
UTAH18005	COPPERTON IMPROVEMENT DISTRICT	Community	990	55	Corrective Action	8/11/2020
UTAH22114	BAR X MUTUAL	Non-Community	136	120	Corrective Action	8/18/2020
UTAH26055	INTERLAKEN TOWN	Community	350	50	Corrective Action	8/24/2020
UTAH15013	COTTONWOOD MUTUAL	Community	2600	50	Corrective Action	8/26/2020
UTAH18179	L & B RESOURCES	Non-Transient	100	540	Corrective Action	8/27/2020
UTAH22003	ECHO MUTUAL	Community	70	150	Corrective Action	8/28/2020
UTAH08043	TRAIL CANYON RESIDENTS	Community	42	70	Corrective Action	9/1/2020
UTAH02010	EAST GROUSE CREEK PIPELINE	Community	70	100	Corrective Action	9/9/2020
UTAH26059	WASATCH MOBILE HOME PARK	Community	31	95	Corrective Action	9/21/2020
UTAH18104	MOUNTAIN DELL CAFE AND GOLF COURSE	Non-Transient	300	60	Corrective Action	10/15/2020
Failure to Comply						
UTAH25077	RIVERBEND GROVE, INC.	Non-Community	25	420	Not Approved	12/13/2016
UTAH25013	GOSHEN TOWN WATER SYSTEM	Community	925	195	Corrective Action	3/8/2016
UTAH26049	SWISS ALPINE	Community	300	100	Corrective Action	4/14/2016
UTAH15038	TAGGARTS GRILL	Non-Community	60	60	Corrective Action	2/6/2018
UTAH09069	PARADISE PARK	Non-Community	120	60	Not Approved	6/14/2018
UTAH09077	BRISTLECONE	Non-Community	180	65	Corrective Action	1/23/2019
UTAH07067	SOUTH DUCHESNE	Community	128	205	Not Approved	4/24/2019
UTAH25133	JEHOVAHS WITNESS CHURCH	Non-Community	100	165	Corrective Action	9/16/2019
UTAH03006	COVE WATERWORKS	Community	52	125	Corrective Action	9/17/2019
UTAH06006	KAYSVILLE CITY	Community	27300	40	Approved (per rc)	3/10/2020
UTAH25184	BATEMANS MOSIDA FARMS	Community	90	260	Corrective Action	4/14/2020
UTAH13001	ALTON TOWN WATER	Community	136	170	Not Approved	4/24/2020
Not Approved Systems						
UTAH09084	JNB MARINE	Non-Community	36	60	Not Approved	9/17/2002
UTAH07039	ESCAPE RV-LAKESIDE PARK	Non-Community	28	85	Not Approved	11/3/2016

UTAH10034	SUN ARCHVIEW LLC	Non-Community	506	35	Not Approved	4/18/2017
UTAH03005	CORNISH TOWN WATER SYSTEM	Community	270	60	Not Approved	9/27/2018
UTAH07023	YELLOWSTONE CAMPGROUND	Non-Community	25	135	Not Approved	9/27/2018
UTAH12028	HOUWELINGS TOMATOES	Non-Transient	150	455	Not Approved	5/29/2019
UTAH15018	SOUTH ROBINSON SPRINGS	Community	28	105	Not Approved	9/9/2019
UTAH09028	CALF CREEK	Non-Community	300	65	Not Approved	9/9/2019
UTAH27093	CANAAN SPRINGS/BIG PLAINS SSD	Community	48	335	Not Approved	11/12/2019
UTAH04052	MADSEN BAY WATER COMPANY	Non-Community	30	100	Not Approved	12/17/2019
UTAH15029	STODDARD INN	Non-Community	25	285	Not Approved	4/24/2020
UTAH20073	INDIANOLA LDS CHAPEL	Non-Transient	320	135	Not Approved	5/12/2020
UTAH27086	NORTH VALLEY RANCHES	Community	25	200	Not Approved	6/2/2020
UTAH10018	BUCKS GRILL HOUSE	Transient Non-Community	150	180	Not Approved	6/2/2020

Current News

DRINKING WATER BOARD PACKET
Current News

Table of Contents

Utah Reduces Toxic Algae Testing After Budget Reductions 4

How did a dead raccoon wind up in Magna’s drinking water? 5

The water footprint versus the water handprint 8

Climate change: Dams played key role in limiting sea level rise 11

The Water Tap: Breaking down the Uncertainty and the Science behind the Pine Valley Water Supply project 14

Utah’s federal lawmakers ask EPA to fund Deer Creek Reservoir infrastructure replacement ... 19

Are abandoned mines affecting our drinking water or could they soon? 21

Dips in Lake Powell, Colorado River a reminder water supply isn’t unlimited..... 28

Research shows water quality could diminish in closed buildings during COVID-19 pandemic 30

Water and sanitation for all in a pandemic 32

COVID-19 Pandemic Should Be A Wake-Up Call For Water Security 36

Navajo 'Water Warrior' Drives Miles During COVID-19 To Deliver To Those In Need..... 38

The Tricky Task of Smelling and Tasting Drinking Water 43

Will COVID-19 kill public drinking fountains?..... 48

GivePower’s solar power plant turns ocean water into drinking water 51

WHERE BY DID EARTH’S DRINKING WATER ARRIVE FROM? ANALYZE CASTS QUESTION ON THE EXISTING METEORITE THEORY 52

EPA awards \$1.6M for IU research on synthetic chemical exposure in rural drinking water 54

Legionnaire's Bacteria Found in Drinking Water at Nine Reopened Schools..... 56

Boil order issued for Scofield after water tests positive for coliform..... 58

Beaver County hopes to block neighbor’s groundwater pumping project 59

Scofield residents must boil tap water after bacteria found in rural system	63
New treatment removes more than 99% of hormones from drinking water.....	64
EPA Hands Coal Industry a Pass to Dump Toxic Wastewater.....	66
‘Health Watch’ issued due to potential harmful algae at Deer Creek Reservoir	68
Can Utah Lake be free of toxic algae in 2021? A Utah company says yes	69
ABANDONED MINES THREATEN DRINKING WATER.....	73
Water boil order remains in place for Scofield in Carbon County	74
EPA Sued Over Not Regulating Perchlorate in Drinking Water (1)	75
UPDATE: Pleasant Grove City lifts boil order after 5 days.....	76
Water, a Utah constitutional amendment and how it affects your home	78
How We Got Conned Into Drinking Bottled Water — And How We Can Stop	80
New York Adopts Drinking Water Standards For Three Toxic Chemicals	87
Faster, on-site way to detect PFAS	89
Thirsting for Solutions to America's Water Crisis	91
New technology turns manure into drinking water in Dane Co.	100
Will Turning Seawater Into Drinking Water Help Water Shortages?	101
Water shortages in US West likelier than previously thought.....	107
Wildfires can leave toxic drinking water behind – here's how to protect the public	109
Is Safe Water a Human Right? Securing Water for Communities Around the World.....	112
Upgrading Building Codes Can Curb Drinking Water Contamination Due to Wildfires	115
The Devastating Flint Water Crisis Wasn’t Even the City’s Worst Lead Exposure Event of That Decade.....	118
Trump Administration Invests \$268M In Rural Water And Wastewater Infrastructure Improvements In 28 States.....	121
Is your drinking water toxic? This app may help you find out.	123
New criteria on drinking water standard add extra levels of protection for families	125
Rural water, wastewater infrastructure in 28 states gets \$268M boost.....	127
Why Dangerous 'Forever Chemicals' Are Still Allowed in America's Drinking Water	129
Ten inventive ways Cubans tackle their drinking water problems	135
Microsoft announces strategy to become "water positive" by 2030.....	137
Universities to treat water in Navajo Nation communities.....	139

EPA’s New Drinking Water Rule Leaves Millions of Toxic Lead Pipes in the Ground to Contaminate a Generation of Children	141
Texas city declares disaster after brain-eating amoeba found in tap water	143
Researchers Have Pioneered A Technique To Purify Water By Using The Power Of Sunlight	145
How a toxic chromium species could form in drinking water	147
Letter: Vote yes on Amendment D to secure your water rights	148
Mt. Pleasant gets USDA funding.....	149
for new treatment plant	149
After Wildfires Stop Burning, a Danger in the Drinking Water.....	150
Ogden City looking to replace outdated water meters, improve accuracy of readings	155
Rainfall remains elusive in Utah with many areas in severe drought as water year ends	157
Study: More Than 200 Million Americans Could Have Toxic PFAS in Their Drinking Water	159
Fears of Legionella in Drinking Water Grow Amid Pandemic	161
The Water Tap: How protecting endangered species protects our water source	166

Utah Reduces Toxic Algae Testing After Budget Reductions

Dozens of Utah bodies of water were not tested this spring for toxic algae blooms this spring because of state budget cuts.

By Associated Press, Wire Service Content Aug. 18, 2020, at 1:50 p.m.

<https://www.usnews.com/news/best-states/utah/articles/2020-08-18/utah-reduces-toxic-algae-testing-after-budget-reductions>

PROVO, UTAH (AP) — Dozens of bodies of water in Utah were not tested for toxic algae blooms this spring because of state budget cuts.

They previously underwent regular testing before the cuts to the Utah Division of Water Quality testing and monitoring program, The Daily Herald reported.

State lawmakers in 2019 dedicated \$200,000 annually for monitoring and testing of the algae blooms. But they cut the funding this year to prioritize Utah Lake initiatives, said Erica Gaddis, the director of the water quality division.

The regulator started monitoring of 65 bodies of water after a harmful algae bloom spread across Utah Lake in 2016, forcing it to close for two weeks. That same year, a different algae bloom killed fish in a reservoir.

Gaddis said her division this year reduced the number of water bodies being monitored from about 60 to 17.

An average of 35 health advisories related to harmful algae blooms were issued between 2017 and 2019, but only four advisories have been issued this year, according to a program summary presented to the legislative subcommittee on Monday.

The Utah Poison Control Center has reported 43 illnesses associated with algae blooms this year, up from the statewide average of 40 registered from 2017 to 2019.

Gaddis urged state lawmakers to restore the organization's funding, saying that harmful algae blooms are becoming more common worldwide in part due to higher spring and summer temperatures.

How did a dead raccoon wind up in Magna's drinking water?

By Brian Maffly

• Published: August 18

Updated: August 19, 2020

<https://www.sltrib.com/news/environment/2020/08/18/how-did-dead-raccoon-wind/>

A dead raccoon turned up in Magna's drinking water system earlier this year after a screen had been removed from a water tank overflow drainpipe, prompting a boil-water order for the northwestern part of Salt Lake County.

While the errant critter was discovered and removed before its festering carcass could foul the Utah town's water supply, the incident illustrates the need for stronger enforcement of rules set for protecting human health.

That's a key finding in one of two legislative audits released Tuesday, calling on the Utah Department of Environmental Quality and its five divisions to improve data tracking and increase enforcement, particularly with the Division of Drinking Water, or DDW.

In one instance, it allowed a country club to operate a deficient well for nearly 24 years before its inadequate casing was fixed, according to the audit.

In the far-ranging reports, auditors also documented problems with the divisions of Air Quality, Water Quality, and Waste Management and Radiation Control, and with how aboveground storage tanks at certain landfills are regulated.

But the biggest concerns were associated with drinking water, where Utah regulators have never issued a penalty under their enforcement authority. Auditors acknowledged the DDW, charged with ensuring the state's drinking water systems are safe, has improved enforcement since 2005, back when it took on average 1,020 days for out-of-compliance providers to comply with state standards. At that time, 115 "significant" deficiencies had gone unresolved for more than five years.

But the 74 days it now takes is still too long, auditors concluded, because uncorrected violations could lead to contaminated drinking water and public health problems, audit supervisor David Gibson told the Legislative Audit Subcommittee on Tuesday.

"Despite the recent increase in enforcement, some systems continue to be deficient. Those systems could be incentivized to comply sooner if DDW used its penalty authority," auditors

wrote in a report submitted to the lawmakers. They also suggested including a measure tracking the time to comply in each case.

DEQ director Scott Baird said he welcomed the auditors' insights and agreed to implement the numerous recommendations and reforms they proposed.

“We are confident what we are doing is working. Is it enough? No, we need to continue improving,” Baird said. “If you look at the outcomes, you can see improvements across the state.”

In response to the drinking water compliance issues, the new division director, Marie Owens, came in with a charge to step up enforcement, according to Baird. The drinking water catastrophes in Flint, Mich., and Milwaukee drove home the need for providers to follow the rules, he said.

“There was a history of trying to help our regulated community to get in compliance. Perhaps we had gotten a little relaxed in trying to speed up that rate of compliance,” Baird said. “It takes time to make a shift of 20 years with one paradigm to another one. We are making great progress. We don't want to stop drinking water. We don't want to limit what they are producing.”

Legislative auditors had drawn similar conclusions last year about the Division of Oil, Gas and Mining, which is not part of DEQ, but still plays an important role protecting the environment. That state agency's historic failure to pursue fines from oil and gas operators created a culture of noncompliance in that industry, putting the environment and public safety at risk, auditors said.

DOGM has since implemented reforms to better hold scofflaw operators accountable. Meanwhile, one of the new audits questioned the practice of dumping drill cuttings and other wastes associated with energy development in landfills permitted only for nonhazardous waste. Auditors suggested the DEQ create a new classification of landfill to receive such waste.

Despite the need to tighten enforcement, Republican lawmakers are now pushing “emergency” legislation that would bar new environmental regulations in a bid to protect oil and gas operators, whose industry has taken a beating after the coronavirus epidemic drove down demand for transportation fuels.

Sen. Ron Winterton, R-Roosevelt, is sponsoring SB6004, which is on deck for Thursday's special session. It would bar the Utah Air Quality and Water Quality boards from creating new or amending existing rules until June 2021. The goal would be to create “regulatory certainty” for oil and gas producers, but if passed the bill could undermine the Division of Air Quality's mission.

One of the new audits insist the division do more to improve air quality in the Uinta Basin, which experiences severe spikes in wintertime ozone pollution, largely due to emissions of volatile organic compounds, or VOCs, associated with energy production.

As long as a well produces fewer than 8,000 barrels of oil a year, it is not required to be equipped with control devices that can cut their VOC emissions by 95%, auditor Hillary Galvin told lawmakers. Auditors estimated that of the basin's 3,600 wells under DAQ jurisdiction, 2,426 do nothing to control emissions.

The state is developing a plan for bringing the basin into compliance with federal ozone standards. But SB6004 could thwart rule-making needed to reduce the emissions that contribute to ozone formation.

DEQ has taken over air quality compliance responsibilities from the Division of Oil, Gas and Mining, but it has not met a goal of inspecting every well at least every five years. In a sign of improvement, the air quality division inspected 262 last year, but even at that rate it would take 13 years to visit each of the basin's 3,600 operating wells once.

All but one of the division's inspectors travel from Salt Lake City, meaning more of their time is spent behind the wheel getting to and from the basin.

DOGM also inspects wells, but its inspectors don't use the same high-end optical gas imaging cameras their DAQ counterparts use for detecting VOC emissions. Auditors urged better coordination between the two agencies to improve inspection efficiency.

Auditors also found deficiencies with the air quality division's program for replacing wood stoves and fireplaces with cleaner-burning appliances. They recommended the division develop ways to more accurately gauge the program's effectiveness and conduct a cost-benefit analysis to determine whether the reductions in wood smoke are worth the cost of the program.

Like the drinking water division, according to the new audits, the Division of Waste Management's landfill program has shown a lax attitude toward enforcement of state standards. The program has not levied a fine in the past six years. Nor has it consistently conducted inspections on the required one-year and three-year cycles or tracked how long noncompliant landfills take to get into compliance.

The waste division's four programs that administer federal standards, by contrast, are doing an adequate job ensuring compliance for the handling of radioactive and other hazardous wastes.

Editor's note: This article was updated at 6:17 p.m., Tuesday, Aug. 18, to add comments from DEQ Director Scott Baird at a legislative audit subcommittee hearing.

The water footprint versus the water handprint

By Will Sarni

August 19, 2020

<https://www.greenbiz.com/article/water-footprint-versus-water-handprint>

Corporate water stewardship is dominated by water footprint strategies such as replenish, water neutral, water positive, etc. While carbon and climate strategies lend themselves to a strategy to become "neutral" or "positive" with respect to emissions across a company's value chain, this does not translate well to water.

The reasons are straightforward: Carbon is fungible (a ton of carbon in the U.S. is the same as it is elsewhere), and carbon does not have multiple dimensions, unlike water, which has economic, environmental, social and spiritual dimensions.

A couple of articles have been on my mind and finally coalesced around this topic of water footprint as limiting to a corporate water strategy.

The 2017 Environmental Law Institute article "Big Data's Big Handprint," by Stephen Harper from Intel, discusses the value of big data's handprint as having a positive impact on solving problems such as energy and climate.

The article makes the case that the information communication technology (ICT) sector is part of the solutions to energy and climate issues. It offers a broader view beyond exclusively focusing on the water footprint of the sector.

But the key point is that while there is a focus on the energy, water and carbon footprint of data centers, the "bigger, more positive story regarding big data and the environment concerns the opposite of the footprint. The handprint, the positive environmental impact, of big data and the Internet of Things ecosystem concerns how they can reduce the footprint of other economic sectors and society as a whole."

The article cites the 2015 "Smarter 2030 Report" regarding ICT and climate change, which concludes that "projects that widespread application of the right ICT technologies could produce a 20 percent reduction in global greenhouse gas emissions by 2020 compared to business as usual. The handprint of ICT applications, on average, is seven times their footprint."

Imagine thinking this way about water. What if we focused on the environmental and social impact of ICT and other sectors in solving water — their handprint — and not just on their footprint?

Reducing water use and participating in collective actions for conservation within watersheds are table stakes.

The second article, "From Corporate Water Risk to Value Creation," which I coauthored with former Anheuser-Busch InBev water executive Bert Share, frames why water stewardship has stalled. In the article, we made the case that water stewardship is stalled because it is transactional and not transformative. We continue to build out this thinking and business case for going beyond current stewardship strategies.

One of our key points is that water stewardship, to date, has been framed as an investment to mitigate water-related risks, rather than an opportunity to grow businesses while simultaneously improving the well-being of communities and the environment. Unfortunately, corporations spend more money and allocate greater resources on growth strategies versus risk mitigation strategies.

A key part of most stewardship strategies is the focus on water footprint targets, whether in operations or across a value chain. This focus on a corporate water footprint limits both the potential value creation to a company and also the positive impact strong water stewardship could have on society, employees and other stakeholders.

The impact that a corporation can have on contributing to solving water challenges (such as scarcity, quality, access to water, sanitation and hygiene, and conservation) goes beyond reducing its water footprint through replenishment or by encouraging replenishment, "water positive" behavior and collective action within a watershed or across its value chain. Reducing water use and participating in collective actions for conservation within watersheds are table stakes. Companies and industry sectors, for the most part, don't leverage what they do best to solve water challenges.

For example, there are lessons to be learned from the ICT sector in how it positions the sector as having a positive impact in addressing energy efficiency and carbon emissions that goes beyond reducing their own footprint.

A few examples are the Digital Energy and Sustainability Campaign (DESSC), which mobilizes the ICT sector on solving energy and sustainability challenges; the recently launched Digital Climate Alliance, which intends to promote digital solutions for climate solutions and innovation; and the Global Enabling Sustainability Initiative (GeSI), which quantifies the positive impact that the ICT sector has in energy efficiency and reduced carbon emissions. Another interesting example is from BASF, detailed in its "Value-to-Society: Measurement and monetary valuation of BASF's impacts in society" (PDF).

Adopting a corporate strategy that quantifies the positive contributions that certain products and services have in addressing the water quality and availability would drive more creative and impactful solutions to water scarcity, poor quality, access to safe drinking water, sanitation and

hygiene. This is out-of-the-box thinking compared with current water stewardship strategies and narratives focused on reducing water footprints and collective action programs.

I propose that the concept of water footprint should be replaced by the "water handprint," a phrase that better captures the full value of corporate contributions that solve water challenges and unlock innovative thinking.

I suspect thinking of impact in those terms would drive greater corporate investment in water strategies and innovation as opposed to water stewardship, which is viewed primarily as reducing risk and/or a corporate social responsibility initiative.

Climate change: Dams played key role in limiting sea level rise

By Matt McGrath - Environment correspondent

19 August 2020

<https://www.bbc.com/news/science-environment-53836018>

The construction of large-scale dams has played a surprising role in limiting rising seas, say scientists.

Over the past century, melting glaciers and the thermal expansion of sea water have driven up ocean levels.

But **this new study** finds that dams almost stalled the rising seas in the 1970s because of the amount of water they prevented from entering the oceans.

Without them, the annual rate of rise would have been around 12% higher.

'Highest temperature on Earth' recorded in US

Atlantic microplastic 'weighs millions of tonnes'

Underground heating projects get £16m cash boost

Helping save the world's plants for 350 years

Measuring how much the seas have risen over the past 100 years or so is a difficult task for scientists.

Researchers found that there was a gap between how much water they knew had gone into the oceans compared to how much those oceans had actually risen by over the past century.

In this new work, the authors revisited information about sources and measurements to come up with a new, more accurate estimation.

As well as the melting of glaciers and the thermal expansion of the seas from heat energy entering the waters, the researchers found that water storage facilities such as dams and reservoirs had made a significant impact on sea levels throughout the period.

There are around **58,000 large dams** in the world right now with many of them constructed over the past 60 years.

The 1950s to 1970s saw a building boom with several large-scale constructions completed, including the Kariba Dam in Zimbabwe, the Bratsk Dam in Siberia and the Aswan High Dam in Egypt.

When the full impact of these giants came on stream in the 1970s, their ability to block water from going into the sea slowed the ongoing rise in global sea level.

"A large part of this dip is because sea level [rise] was almost brought to a halt because of the amount of water stored in dams," said lead author Dr Thomas Frederikse, from Nasa's Jet Propulsion Laboratory in Pasadena, California.

"So by building dams, we almost stopped sea level rise for a decade or so."

The study finds that overall sea level has risen by approximately 1.56mm per year between 1900 and 2018.

The largest contributors to rising seas over most of the 20th century have been melting glaciers which have responded faster to a warmer world.

Over this whole period, the authors believe that sea level would have been around 12% higher without the influence of dams and reservoirs.

However, the influence of dams in holding back the waters began to fade in the 1990s.

Concerns were growing about the environmental impact of large dams, and the number of projects began to decline.

At the same time, the growing influence of climate change spurred an increase in sea levels through increased ice loss from Greenland and greater thermal expansion of the waters as more heat energy went into the oceans.

All these factors have seen the rise in sea levels accelerate over the past 30 years and it is now running at 3.35mm per year.

So could a new programme of dam building help save the world from the rising waters?

Earlier this year, a team of researchers **produced a paper** on how Europe might avoid the worst impacts of rising seas by building a huge dam across the North Sea.

But Dr Thomas Frederikse doesn't think adding extra barriers would now work.

"At the height of the dam building, we were able to slow sea level rise by about 0.8mm per year.

"And now we're seeing sea levels rising in the last 10 years by about four millimetres per year."

"So it means that you have to build five times the amount of dams that we built in that period to stop the current rate of sea level rise."

"I think that's impossible."

The better and much cheaper option according to Dr Frederikse is to cut emissions of CO₂, faster and deeper than at present.

The study has been published in the journal Nature.

The Water Tap: Breaking down the Uncertainty and the Science behind the Pine Valley Water Supply project

Joan Meiners

St. George Spectrum & Daily News

Published 8:00 am MT Aug 21, 2020 Updated 10:01 am MT Aug 24, 2020

<https://www.thespectrum.com/story/news/2020/08/21/water-tap-breaking-down-pine-valley-water-supply-project/5614483002/>

As part of this new water series, each Friday (Saturday in print) we will be addressing a new topic that is relevant to water security in Iron and Washington counties. Check back each week for updates on ongoing water issues, interviews with experts, and explorations of how we can ensure a better water future for the growing communities in southwestern Utah.

Last week on The Water Tap, Beaver County Commissioner Mark Whitney shared concerns about Iron County's long-standing plans to extract 15,000 acre-feet of groundwater per year from Beaver County's Pine Valley.

“We feel [the state] was very biased in awarding that water [to Iron County],” Whitney said. “It was totally improper and unprofessional and unneighborly. Why don't they mine their own water?”

Spearheaded in 2006 by the Central Iron County Water Conservancy District as an effort to diversify the future water supply to fast-growing Cedar Valley, the Pine Valley Water Supply project is a \$260 million endeavor to construct 15 groundwater production wells, eight groundwater monitoring wells, 12 miles of power line, nine miles of access roads, a 200-acre solar field, an underground storage tank and 66 miles of buried water pipeline stretching across county lines.

The CICWCD has already secured the rights to the water and the project is currently undergoing environmental review before potentially breaking ground in 2027.

But despite this progress, one lingering concern was brought up repeatedly in interviews with multiple sources: uncertainty over whether there is enough extractable groundwater available in this area to avoid affecting surface water flows or access by local animals and plants.

“The amount of water that was appropriated really only exists on paper,” said Kyle Roerink, the Executive Director of the Great Basin Water Network, an organization focused on protecting Great Basin water resources for future generations.

The uncertainty

Indeed, the February 2019 water rights settlement agreement, which was ultimately approved by Beaver County Commissioner Mark Whitney, acknowledges uncertainty in the amount of available water, stating: “The Parties acknowledge that they have a difference in opinion regarding the amount of water available in the Wah Wah Valley and the Pine Valley – namely the safe yield of the aquifers in those valley.”

Paul Monroe, General Manager of CICWCD, pointed out this settlement language himself, though to some it casts doubt on the wisdom of his organization’s project. Monroe, however, is confident that there will prove to be enough water.

“We don’t anticipate that there will be impacts,” Monroe said. “The best science that’s available says that it’s renewable and sustainable at the amount that we received.”

Monroe elaborated that, while they currently have models showing sufficient water resources to pump 15,000 acre-feet per year to Cedar Valley, it “can sometimes take 20 or 30 years of pumping” before the impacts of groundwater extraction are visible.

If pumping does prove to be a strain on the Pine Valley aquifer, the CICWCD would implement a groundwater management plan intended to “make whole” residents who can prove their access to local water has been impacted. This could mean running a new pipe from the project to the resident or finding a way to compensate them for water lost.

Mark Wintch is one such resident who remains unconvinced. He owns a ranch in Beaver County’s Wah Wah Valley, one valley over from the project site in Pine Valley, where his family farms 220 acres and tends 1,200 head of cattle. The operation has been his family’s focus since 1896 and it relies heavily on a natural spring as a source of both water and hydroelectric power.

“My concerns are the opposite of [Paul Monroe’s],” said Wintch. “He’s saying that it won’t affect surface water. There’s a clear example of groundwater affecting surface water in Nevada.”

Although Wah Wah Valley is not currently slated for water extraction to Cedar Valley, CICWCD has already obtained the water rights to pursue groundwater there in the future. Wintch worries that, even if he were to be able to demonstrate that his spring flow was affected, once the project is up and running his water loss would never truly be made whole.

“We all know, if those pumps get turned on and one water spigot in Cedar Valley is turned on from that water, it will never be turned off. Never,” said Wintch.

Monroe disputes this assertion, stating that he has no desire to harm anyone and that the CICWCD fully intends to “make everyone whole” throughout this process.

"I don't want to impact any farmer or rancher," Monroe said. "The way to protect yourself is to have accurate data showing how much your spring has been flowing before we put in the water line. We have several monitoring steps in place to ensure that if anything happens we'll be able to make it right "

Despite these reassurances, Wintch is not alone in his concerns. Documentation from 2006 and 2007 show a flood of protests to CICWCD's water rights application, many from government agencies. Roerink shares worries outlined in some of those documents that this project could alter the water balance in Snake and Wah Wah Valleys and the Pine Valley mountains, potentially affecting subsurface water flow all the way up to the Great Salt Lake.

“The National Park Service protested, saying its resources could be affected,” Roerink recalled. “The USDA protested. The Fish and Wildlife Service protested. At one point even the Southern Nevada Water Supply protested.”

The science

So, is there enough water, or isn't there? With so much unresolved conflict and uncertainty afoot, I reached out to Philip Gardner, a hydrologist with the USGS and the lead author on the most recent independent study of water resources in Pine and Wah Wah Valleys, to get to the bottom of this best science on water availability.

To minimize confusion and editorialization, that (shortened) conversation is presented here verbatim:

Joan Meiners: “You’ve said that one of the first steps is to get all these different groups and agencies together and figure out what the main questions are for the study. So, what were the main questions for this study?”

Philip Gardner: “The two main questions at the beginning of this study were whether the water they were applying for is there in the quantity they are applying for it, and what the impacts might be in developing this project, in this case, pumping groundwater in these two basins. You often have other users of those basins. And so big conflicts can arise when someone new comes in and develops something that impacts another person’s water.”

JM: “And what did you find in answer to that first question?”

PG: “Our estimate that we published of available water in the Pine valley aquifer was 11,000 acre-feet. And the water right given was 15,000 acre-feet. The entire estimate of annual recharge from rain and snowmelt from everything inside that basin is 21,000 acre-feet. What we concluded through our study is that a certain amount of that was not making it down from the mountains to replenish the valley fill aquifer. Again, there are big uncertainties in these numbers.

Doing groundwater surveys is really interesting because you're really trying to include a lot about valley aquifers, but you can only sort of probe that aquifer in a few places. I think it's pretty well understood that there's a fair amount of uncertainty involved."

JM: "So if a previous study and your more recent study both estimated the Pine Valley aquifer sustainable recharge at about 11,000 acre-feet per year, can you explain the justification for awarding 15,000 acre-feet of groundwater rights in that valley?"

PG: "Yeah. Well, there's a fair bit of uncertainty in that 11,000 number. And there's a specific reason – these two valleys are really unique compared to a bunch of the valleys around. And they are unique in a way that makes it more difficult to accurately estimate the amount of water flowing through every year. In the majority of these basins, which are closed basins, all the water that goes in the middle comes back out as spring flow or evaporation or plant transpiration. And if you know how much is coming out, then you can say with a lot more certainty how much was going in. In [Pine and Wah Wah] Valleys, the water levels are hundreds of feet deep everywhere. And so water that gets into the valleys moves out to the north, underground, and keeps on going to discharge somewhere else. So since you can't go down and set up a bunch of instruments and measure how much water is coming out of the ground, you have to make a recharge estimate independently and it always is less certain."

JM: "Ok. But say that your estimate of 11,000 acre-feet per year is exactly correct. What are going to be the consequences of withdrawing more water per year from the aquifer than is being recharged?"

PG: "Well, whenever you start pumping water out of a system, you're basically capturing it from somewhere else. If there's 11,000 acre-feet going into the aquifer, that 11,000 feet must be going out of the aquifer. And if you come in and start trying to withdraw 11,000, wherever it was going before, it's not anymore. It's been captured by the pump. If you withdraw more than that, then you're basically taking water out of storage, and now you just keep lowering the water levels constantly. But I would caveat that by saying that the state water engineer recognizes all these uncertainties. And typically, when any water development project is developed, they usually monitor the water levels, and monitor the surroundings and other sources of water."

JM: "That brings me to my next question, which is that there is a ranching family in Wah Wah Valley, the Wintchs, that is very concerned about the pumping causing their spring to dry up. Based on your study, is that something that could happen?"

PG: "I'm familiar with Mark Wintch and his family and we've been out there and made measurements on their springs. And the only way to know for certain is a real cause and effect. We will never know in Mark's case until this is developed. The USGS would say that it's not likely that pumping in Pine Valley would affect his springs. It would be more likely that would happen if they develop in Wah Wah Valley. Continuous monitoring of the ranch flow from Wah Wah springs would be the best approach."

JM: “What about the possibility of pumping in Pine Valley affecting other groundwater sources, like those to the north in Snake Valley?”

PG: “Well, there's a separate report published, where it shows some hypothetical scenarios of what things might look like in the future. Pumping in Pine Valley, years into the future, it did show water level drops reaching out into Snake Valley and across over toward towards Great Basin National Park. Now, that model wasn't really built for that purpose and I would say it's not calibrated in that area. We look at it like it's a rough prediction. But it suggests that it could happen. And it's worth considering.”

Utah's federal lawmakers ask EPA to fund Deer Creek Reservoir infrastructure replacement

By Connor Richards Daily Herald

Aug 21, 2020

https://www.heraldextra.com/news/local/govt-and-politics/utah-s-federal-lawmakers-ask-epa-to-fund-deer-creek-reservoir-infrastructure-replacement/article_a047c06c-b430-53b1-951e-966e938005de.html

All six members of Utah's congressional delegation joined together on Tuesday in requesting that the Environmental Protection Agency consider providing funding for a project to replace the decades-old infrastructure of the Deer Creek Dam.

In a letter addressed to EPA Administrator Andrew Wheeler, the congressmen asked for Wheeler's "full and fair consideration for the Provo River Water Users Association's (PRWUA) request for loan assistance ... for the Deer Creek Raw Water Intake Project," noting that the Deer Creek Reservoir "supplies water to nearly half of Utah's population."

"After nearly 80 years of operation, the Deer Creek Dam is in significant need of infrastructure improvements," the letter said, which was led by 3rd Congressional District Republican Rep. John Curtis. "The intake and guard gates have reached the end of their useful life. With difficult accessibility and a lack of manufacturer parts, there is no simple way to perform maintenance or to repair or replace the gates if they fail."

The infrastructure replacement project, which the PRWUA estimates will cost approximately \$40 million, would include construction of "state-of-the-art defense mechanisms against aquatic invasive species" to provide "safeguards against a quagga mussel infestation and the associated negative effects on critical infrastructure," the letter said.

"Deer Creek Reservoir is vital to Utah's economy, both for water supply and for recreation," wrote the congressmen. "These infrastructure updates are critical to providing Utahns with the most vital of resources."

The funding would come through the Water Infrastructure Finance Innovation Act (WIFIA) program that "accelerate(s) investment in critical water infrastructure through innovative and flexible financing that can support diverse projects in both large and small communities," according to the EPA.

The federal loan funding can be used for a variety of water infrastructure initiatives, including drinking water or wastewater treatment projects, drought prevention and mitigation projects and “desalination, aquifer recharge, alternative water supply and recycling projects.”

In a summary of the Deer Creek Intake Project, the PRWUA said the initiative “meets all the criteria of the WIFIA program while creating an opportunity to expand and diversify the WIFIA portfolio.”

“In fact, this project is exactly the type of project congressional leaders had in mind when crafting the long-term, low-cost loan program,” the Provo River association wrote. “It is a regionally significant, multigenerational project that is replacing 80-year old infrastructure and is critical to the water supply to 1.5 m(illion) Americans.”

The PRWUA noted that the project would likely need “multiple funding sources” and that “WIFIA funding is critical and would allow the project to start significantly sooner than otherwise anticipated.”

The Deer Creek Reservoir is a popular recreation site for boating, fishing and camping, and provides drinking and irrigation water for cities and towns along the Wasatch Front.

For more information about the Deer Creek Intake Project, which the PRWUA expects to break ground on in 2021, visit <https://www.prwua.org/>.

Are abandoned mines affecting our drinking water or could they soon?

EPA to initiate a preliminary Superfund assessment for three Utah sites, including Cottonwood canyons, following settlement over Gold King Mine spill

By [Amy Joi O'Donoghue@Amyjoi16](mailto:Amyjoi16) Aug 23, 2020, 8:00pm MDT

<https://www.deseret.com/utah/2020/8/23/21365132/are-abandoned-mines-affecting-our-drinking-water-or-could-they-soon>

SALT LAKE CITY — There are hundreds of thousands of abandoned hard rock mining sites or features scattered throughout the West, and federal and state officials are nowhere close to identifying those that potentially pose a hazard to drinking water.

The Gold King Mine spill in Colorado, which released a torrent of ugly mustard-colored pollutants that contaminated waterways in three states and the Navajo Nation, was a visually graphic reminder from five years ago of how much of a threat and expense these abandoned mines pose.

Hundreds of legal claims were filed against the U.S. Environmental Protection Agency — which had oversight of the mine's remediation when it breached — with Utah settling its lawsuit just this month with the federal agency over Gold King Mine.

In the agreement, the EPA said it would initiate a preliminary Superfund assessment for a trio of sites in Utah, including two former mining districts in Big Cottonwood and Little Cottonwood canyons, which are home to hundreds of legacy mines scattered on a patchwork of both public and private land.

Their existence in the canyons is an uncomfortable and threatening specter, since the Wasatch Canyons provide 60% of the Salt Lake Valley's drinking water, hailed as one of the most pristine resources because it comes from a natural reservoir of snowpack and rushes from treatment to tap in just 24 hours.

But mine debris and waste rock in those canyons have already created impairment problems for aquatic life due to the contaminants of copper and cadmium, the latter of which is a carcinogen. Zinc has also been determined to be a threat to aquatic life in Little Cottonwood Canyon.

Erica Gaddis, director of the Utah Division of Water Quality, said the standard for cold water fisheries is much stricter because the animals exist in the water 24/7. The contaminants, she stressed, are not testing at levels of concern for drinking water standards.

Tickling time bomb?

But some people fear it is only a matter of time that the legacy waste from hard rock mining in the canyons will filter into the creeks at such levels that drinking water is compromised beyond the ability for treatment plants to handle, whether it is the water itself or washed down sediment.

“I am concerned this is a problem that has been ignored for too long,” said Salt Lake County Councilman Richard Snelgrove.

“There are a lot of questions and solutions are long overdue. I am pleased that the EPA is looking at this as a potential Superfund cleanup site. It is obvious that not all is well in that canyon.”

Snelgrove said he is an avid hiker and especially likes to venture into the more remote Cardiff area in Big Cottonwood Canyon.

“On a personal level I cherish these mountains. They are some of our crown jewels, not only for Salt Lake County but the state of Utah.”

He was up there three years ago and was startled to see abandoned mine waste and rusty colored water trickling over it, eventually winding its way into Big Cottonwood Creek.

“Rusty water comes out of those mine shafts, flows over these tailings that nothing will grow on and then flows into our drinking water for Salt Lake County.”

The property owner is alleged to be Salt Lake City, which in its watershed plan in 1999 identified metal contamination from legacy mine sites as a problem that merited a remediation plan to be put into place by 2001 — nearly 20 years ago.

That plan is not in place.

“Salt Lake City has some explaining to do on their property. They need to clean up their trash heap,” Snelgrove said.

Laura Briefer, director of the Salt Lake City Division of Public Utilities, said what Snelgrove is seeing is likely waste rock, not tailings. And while the city owns chunks of property in the Cardiff area, Briefer said she could not say if the property Snelgrove is referencing is city-owned without doing a site visit.

“We don’t have tailings in the Wasatch Canyons,” she said, adding there are mine tunnels that may be leaching water, but their risk in Big Cottonwood Canyon has yet to be assessed and drinking water standards are being met.

Yet despite the watershed plan from 1999 dictating a mitigation effort in place for the canyons, Salt Lake City doesn’t appear close to knowing the extent of the problem on the very property it owns.

“I am not aware of Salt Lake City owning property with mine waste in Cardiff or in Little Cottonwood Canyon. We would need to survey the property to understand and confirm property ownership,” Briefer said, even though state mining officials told the agency city- owned property had mine openings in Cardiff.

Briefer said the city still needs to confirm what the state agency informed them.

The EPA announcement that it would initiate Superfund site investigations at legacy mining sites in the canyons came as a surprise to Briefer, she said, but the city welcomes the review.

“I think this is a good outcome to the settlement,” she said. “But often these investigations do not lead to a Superfund assessment. We would be surprised if it did.”

But Snelgrove said there needs to be greater action to remediate these sites in more remote areas that may pose a risk.

“The mine openings are still open the way they were left 100 years ago. When it comes to health and safety issues, that is not a good excuse,” he said. “The magnitude is enormous and the consequences are enormous, so we can’t have the attitude of, ‘Nothing to see here, just move along.’”

Mark Allen, founder of Protect and Preserve American Fork Canyon and the executive director of the American Fork Canyon Alliance, agrees with Snelgrove.

“It is kind of a termite problem. If there is a barn burning down, everyone races to put out the fire. But if a termite is eating at the foundation, it is out of sight and out of mind.”

Tackling the termites

Allen, frustrated over heavy metals contamination at former mine sites in American Fork Canyon, petitioned the EPA to conduct a site assessment of their risks on the heels of the Tibble Fork Dam release in August of 2016.

A \$7.3 million rehabilitation project to drain the lake inadvertently triggered a large release of metals-laden sediment into the north fork of the American Fork River.

The result was a significant fish kill and metals pollution that threatened many downstream communities.

Allen said he believes the Tibble Fork release was many times more severe than Gold King Mine, but because it wasn’t as visual with the yellowish iron oxides in Colorado, and was contained in one geographical area, it didn’t garner the same attention.

“(Gold King) was an extremely visual event of pollution. It was so graphic,” Allen said.

Gaddis said the Tibble Fork release has largely been settled, with monitoring that has gone on in subsequent years showing concentrations of contaminants at levels that adhere to federal standards.

The EPA, at Allen's request, is continuing to review the upstream threats posed by legacy mines that through streams and creeks deposit the metals in sediment that can be washed downstream.

Ryan Dunham, the EPA's site assessment manager for the American Fork Canyon review, said the agency concluded the mine sites did not warrant a large scale cleanup, although another branch of the EPA is continuing to work with the state and private property owners such as Snowbird to mitigate recreational threats.

Signage and fencing have been put up to keep ATV enthusiasts off the tailings and to warn of potential exposure.

Snowbird voluntarily implemented its own program to address issues at Mary Ellen Gulch, is conducting sampling and will be granted a water quality pollution discharge permit for the site — at the resort's request — which adds another layer of regulatory oversight.

Gaddis said that particular permit program where property owners can be identified and there is active work on the property will roll out in the future under guidance from the EPA.

She added that one of the biggest hurdles in addressing mine waste is mapping the sites, identifying the owners and determining the priority at which they should be mitigated.

A 2020 report by the U.S. Government Accountability Office explored the breadth of the problem, uncovering some sobering statistics that should give one pause.

Consider:

The Bureau of Land Management estimates that based on current staffing and resources, it will take 500 years for the agency to complete an inventory of abandoned hard rock mines and features on its land.

The EPA estimates that based on current databases there are more than a half million abandoned hard rock mining sites on BLM, National Park Service and Forest Service lands.

In 13 Western states that include Utah, the inventory puts abandoned mine sites at about 246,000 within their borders, but estimates are likely that the number is at 620,000.

As of July 2019, the actual environmental hazard costs of the 25 most expensive mining and mineral processing sites ranged from \$50 million to \$583 million per site, and the EPA has been working on some of these for more than 20 years.

The costs are staggering to the federal government, to states, to private property owners.

EPA spent \$2.9 billion through fiscal years 2008 through 2017 to identify, clean up and monitor hazards at abandoned hard rock mines. The 13 Western states included in the report spent a collective \$117 million in nonfederal funds during the same time period, with California, Colorado and Idaho spending the bulk of that — 86%, according to the Government Accountability Office report.

The EPA said to its knowledge, no federal agencies or the states have a comprehensive dataset that could provide the extent of the problem associated with what's called "mine influenced waters" throughout the country or in the West. Those waters generally contain dissolved metals or metalloids which may include lead, copper, silver, manganese, cadmium, iron, zinc and mercury, among others.

It added that elevated concentrations of these metals in surface water and groundwater can eliminate their use as drinking water or aquatic habitat.

Additionally, through its Superfund program, the EPA tracks approximately 500 hard rock mining and/or mineral processing sites across the country, which represents less than 0.1% of the abandoned hard rock mining sites.

Against that backdrop, Allen said he believes more needs to be done.

"Kennecott has worked hard to clean up what they own, but that mindset needs to move up to the canyons," he said. "Nobody has budgets to clean up our watersheds so they just pretend it is not an issue. ... It is like playing pin the tail on the donkey. Nobody wants to be the donkey."

Gaddis said her division has been working closely with the Utah Division of Oil, Gas and Mining to launch an inventory later this year that will specifically work to document discharging mines in the state of Utah, with numbers that are not known at present.

"After the Gold King Mine spill happened, we got a lot of inquiries if this were problematic in Utah," said Steve Fluke, administrator over the mining division's Abandoned Mine Reclamation Program.

"There is not a comprehensive inventory in this state or frankly any other state. ... But there are not a lot of flowing mines in the state because it is so dry. There are naturally more in the Wasatch. In the Wasatch, we have noticed mines that have some pretty significant flows."

The work done by the mining division thus far has revealed 29 mines discharging water or mine waste in the Wasatch Mountains, but it is not conclusive. Overall, Fluke said there are an estimated 16,000 hazardous mine openings in Utah — counted as a hole in the ground greater than 10 feet deep — of which about 6,500 have been closed.

Fluke said he noticed two collapsed mine adits, or what appear to be, while hiking in Cardiff that he brought to the attention of other state agencies and the EPA.

“I would not want to say they are ticking time bombs waiting for a Gold King Mine incident, but they need to be looked into,” he said. “Who knows what it would take to break them?”

Gaddis agreed the abandoned mines in the Wasatch Canyons pose potential problems.

“Certainly the discharging mines in the Wasatch where we have impaired water quality, that is a concern for aquatic life,” she said.

Regulatory roadblocks

Beyond inventory challenges and limited budgets, Gaddis said states encounter mine contamination instances that don’t rise to the level of federal intervention at a heightened level under the Clean Water Act.

American Fork Canyon, for example, didn’t warrant cleanup action under federal standards, with the EPA site assessment manager adding that sampling in the years after the Tibble Fork release demonstrate good water quality overall.

The GAO notes that until the 1970s, mine operators were not required to remediate the land after a mine’s resources had been exhausted, so they could just walk away.

While government entities and conservation groups, for example, may want to step in to initiate a cleanup, that means assuming liability — and those stringent liability rules hinder voluntary efforts.

Worries over liability prompted the Uinta-Wasatch-Cache National Forest Service to express concern over any proposed land trades after it identified private lands involved in the deal that contained legacy mine sites. A Forest Service memo from 2019 said the agency would not acquire any lands in the Wasatch Canyons with mine tunnels or parcels with waste rock piles greater than a half-acre in size.

The exit of the Forest Service from those portions of the swap, which was part of a proposed federal designation, was a setback for negotiations.

Forest Supervisor Dave Whittekiend said abandoned hard rock mines are a problem in the forest.

“The Cottonwoods and American Fork is where we have had the biggest issue with contamination of heavy metals,” he said.

Remediation has been encouraged through something called the good Samaritan program in which the EPA enters into settlement agreements with volunteer parties willing to do cleanup work without taking on the liability.

The administrative guidance, some critics say, is not strong enough to ward off liability under the Clean Water Act so it has its limitations absent a narrowly tailored federal legislative fix.

But so far, the EPA has entered into three settlement agreements that did not require a Clean Water Act permit and is currently working with a good Samaritan on a Colorado abandoned mine for potential remediation.

Snelgrove said it is imperative agencies and people work together to solve the mine waste problems in the canyons and conquer these hurdles.

The councilman, who represents all county residents through his at-large seat, said Salt Lake County has to be one of those entities doing more. Earlier this year, when the county updated and adopted its general plan, which includes issues needed to be tackled in the canyons, Snelgrove voted against it.

His objections? He said it did not adequately address canyon threats such as wildfire risk and mine waste remediation.

“My concern was raised two or three years ago when I hiked the Cardiff area and it was accelerated with the EPA announcement of possible Superfund designation,” he said.

“If the attitude prevails of there is nothing to see here and we kick the can down the road — instead of it being a problem for 1 million people in this valley, it will be a problem for 2 million people in the decades to come — and it will be a problem for our children and grandchildren.”

Dips in Lake Powell, Colorado River a reminder water supply isn't unlimited

Written by [Associated Press](#)

August 23, 2020

<https://www.stgeorgeutah.com/news/archive/2020/08/23/apc-dips-in-lake-powell-colorado-river-supply-a-reminder-water-supply-isnt-unlimited/#.X1Er1XIKiU1>

CARSON CITY, Nev. (AP) — The white rings that wrap around two massive lakes in the U.S. West are a stark reminder of how water levels are dropping and a warning that the 40 million people who rely on the Colorado River, including many in Utah, face a much drier future.

Amid prolonged drought and climate change in a region that's only getting thirstier, when that reckoning will arrive – and how much time remains to prepare for it – is still a guess.

The U.S. Bureau of Reclamation released [projections](#) Aug. 14 that suggest Lake Powell and Lake Mead will dip 16 feet (5 meters) and 5 feet (1.5 meters), respectively, in January from levels recorded a year earlier. Despite the dip, Lake Mead would stay above the threshold that triggers severe water cuts to cities and farms, giving officials throughout the Southwest more time to prepare for the future when the flow will slow.

The bureau has proposed a [140-mile pipeline between Lake Powell and the Sand Hollow Reservoir](#) to provide Washington County with a second source of water.

“It’s at least a couple of decades until we’re saying, ‘We don’t have one more drop for the next person that comes here,’” said Ted Cooke, general manager of Central Arizona Project, the canal system that delivers river water. “But people certainly ought to be aware that water – the importation of a scarce commodity into a desert environment – is expensive and, with climate change, going to get even more expensive.”

The Colorado River supplies Arizona, California, Nevada, Colorado, New Mexico, Utah, Wyoming and Mexico. Its water pours out of faucets in growing cities like Los Angeles, Denver, Las Vegas and Phoenix and nourishes enough farmland to yield 15% of total U.S. crop output and 13% of livestock production.

Last year, with increasingly less water flowing to Lake Mead and Lake Powell – the two largest man-made reservoirs in the United States – Arizona, California and Nevada agreed to a drought contingency plan that built in voluntary cuts to prevent the reservoirs from dropping to dangerous levels. The other states historically haven’t used their full allocation of water and focus on keeping Lake Powell full enough to generate hydropower.

Nevada and Arizona will make those voluntary cuts under the new projections, which they also made last year for the first time. But because neither state is using its full share of water, the impact has been minimal and hasn't trickled down to homes. Mexico also is facing another round of cuts.

"The future of the river is going to be drier than in the past. All the climate models and the current drought suggest that," said Colby Pellegrino, Southern Nevada Water Authority's deputy general manager of resources. "Every sector is going to have to learn how to do more with less."

Since 1990, the population has more than tripled in the Las Vegas area, which gets nearly 90% of its water from the Colorado River. But by treating and recycling almost all water used indoors – for flushing toilets and running dishwashers, for example – and replacing nearly 305,000 square miles (790,000 square kilometers) of grass with desert-friendly landscaping, the area has consumed far less than it's allocated.

Elsewhere, officials are scrambling to find alternative water supplies to sustain growing cities and farms. Agricultural areas can't replicate Las Vegas' turf removal program. And Nevada's ability to restore treated wastewater to Lake Mead, which is about 30 miles (48 kilometers) east of Las Vegas, can't be done in places with less storage capacity, like Southern California, where wastewater runs into the Pacific Ocean.

Tribes within the Colorado River basin also have at least 785,000 acre-feet of water each year that they have claimed but haven't legally settled, or enough to fill about 3.2 billion average-sized bathtubs, according to a federal study. Arizona pays two tribes for their unused water, relying heavily on it to fulfill the state's obligations in the drought contingency plan. At some point, that arrangement could change as supplies shrink and tribes need more of their share.

John Fleck, director of University of New Mexico's Water Resources Program, said that unlike conservation, costs hinder most proposals to bring in new water.

"What you're seeing is these expensive projects are dying because of this conservation trend," he said. "They're just super expensive, and we're seeing communities successfully conserving without too much trouble. Without them, it doesn't feel particularly painful."

Cooke acknowledged the costs of alternative supply projects but said conservation-minded academics like Fleck have a different perspective because they aren't accountable to customers and constituents.

"We're working on both of those things – both to reduce consumption and to increase supply – and we don't have to make a choice between one or the other," Cooke said.

Research shows water quality could diminish in closed buildings during COVID-19 pandemic

ASU researcher joins study to understand how extended shutdowns affect water quality in buildings

August 24, 2020

<https://asunow.asu.edu/20200428-research-shows-water-quality-could-diminish-closed-buildings-during-covid-19-pandemic>

While bars, gyms, dine-in restaurants and other buildings have been closed to help prevent the spread of COVID-19, water left sitting in pipes could change in quality.

It's possible that water left sitting for long periods of time could contain excessive amounts of heavy metals and pathogens concentrated in pipes nationwide, say researchers who have begun a field study on the impact of a pandemic shutdown on buildings.

“There are several factors that encourage the growth of disease-causing microorganisms in buildings — low or nonexistent disinfectant residual, such as chloramine or chlorine, poor temperature control and water stagnation inside water pipes,” said Kerry Hamilton, a researcher with the Arizona State University Biodesign Center for Environmental Health Engineering. Hamilton has expertise in risk assessment for pathogenic microorganisms, specifically for the bacteria that causes Legionnaires' disease commonly linked to poor water quality in buildings.

Hamilton is a co-author of a new report completed with Purdue University and funded by the National Science Foundation's Rapid Response Research program. The study involves monitoring water quality in buildings both during a period of extended vacancy and when occupants have returned.

Her contribution to the study focused on summarizing practices used to notify building occupants of potential water quality issues and what communication typically takes place between utilities, building owners or facilities managers, health departments and building occupants.

“This may be an issue when high ambient temperatures can encourage the growth of undesirable microorganisms in water systems in buildings,” said Hamilton, an assistant professor with the School of Sustainable Engineering and the Built Environment.

“Shutdowns due to COVID-19 can exacerbate stagnation problems and point to the need for utilities, facilities managers and the general public to be especially aware of these issues and to

take action to prevent disease from exposure to water that has been allowed to remain stagnant in pipes.”

“We don’t design buildings to be shut down for months. This study focuses on the consequences and could help building owners make sure that their buildings are safe and operational when occupants return,” said Andrew Whelton, a Purdue associate professor of civil engineering and environmental and ecological engineering and lead investigator.

Whelton’s field study is part of a national effort to advise public health officials, building owners and water utilities on how to safely recommission buildings with low or no occupancy due to the pandemic.

Whelton and other researchers across the U.S. have begun drafting recommendations compiled by this effort in a study published June 16 by the American Water Works Association journal "Water Science." Collaborators on this study include experts from leading plumbing safety scientists and engineers from ASU, Purdue, Virginia Tech, Legionella Risk Management, Inc., University of Memphis, University of Iowa, Northeastern University and Polytechnique Montréal in Canada. The recommendations are based on implications from other studies of water stagnation in large buildings.

Typically, buildings can prevent stagnation through regular water use. This brings in new water with disinfectant. But extended building shutdowns will require different solutions, the researchers said. The Centers for Disease Control provides guidelines for the reopening of buildings after shutdowns.

Water and sanitation for all in a pandemic

Published: 24 August 2020

David M. Hannah, Iseult Lynch, Feng Mao, Joshua D. Miller, Sera L. Young & Stefan Krause

<https://www.nature.com/articles/s41893-020-0593-7>

Hand hygiene is critical for reducing transmission of communicable diseases, as we are so acutely aware during the COVID-19 pandemic. UNICEF has identified behaviour change and knowledge promotion as top strategies for increasing handwashing during this crisis, while acknowledging that millions of people lack the water necessary for handwashing.

An estimated 40% of households globally lack access to basic handwashing facilities^{1,2}. A recent cross-cultural study of household water insecurity experiences found that nearly one in four of 8,081 randomly sampled households across 29 sites in 23 low- and middle-income countries (LMICs) were unable to wash their hands in the previous month (Fig. 1)³. These challenges are not unique to LMICs. Indeed, many poorer families in high-income nations experience similar water, sanitation and hygiene (WASH) problems⁴.

In the spotlight of the current COVID-19 pandemic, this Comment explores the challenge of hand hygiene in a changing water world and reflects on the importance of making rapid progress to “ensure availability and sustainable management of water and sanitation for all” (United Nations Sustainable Development Goal (SDG) 6). We contest that solutions to combat the spread of infectious disease, including COVID-19, must consider household water insecurity as a function of water availability, quality and accessibility. Drawing on the latest evidence, we provide recommendations on how to improve human health and well-being during a pandemic by reducing household water insecurity.

Water availability and quality

Although our blue planet is 70% covered by water, only 3% is freshwater (of which ~70% is snow or ice, or otherwise unavailable for human use). Furthermore, available freshwater is unequally distributed geographically in space and time, such that an estimated four billion people experience ‘severe water scarcity’ for the duration of at least one month every year⁵, causing difficulties for handwashing and sanitation. Challenges with availability are projected to become more widespread and acute due to climate change and associated increases in hydrological extremes (such as floods and drought), as well as changed water demand due to population growth, displacement, intensification of agriculture and infrastructure degradation⁶.

While it is more obvious how droughts reduce water availability, there is increasing recognition that flooding can reduce the availability of clean water due to, for instance, storm-induced contamination from combined sewerage overflows polluting rivers and groundwater resources.

As a result, water may be unsuitable for consumption or hygiene due to contamination by multiple chemical or biological pollutants (for example, pathogens, viruses, bacteria and protozoa) that present immediate risks to health. For example, handwashing with polluted water may increase the risk of contracting enteric infections that can cause diarrhoea⁷, which is a proximate driver of undernutrition that can exacerbate a range of morbidities. The majority of the annual 1.7 billion cases of childhood diarrhoeal disease, the second largest cause of death for children under five, are related to poor water quality⁸, highlighting the severity of water insecurity consequences. Furthermore, intensive handwashing, especially with contaminated water, can cause skin lesions that serve as conduits for waterborne infectious agents such as bacteria or viruses, as well as chemicals and allergens, to enter the bloodstream⁹. Thus, poor water quality can undermine an individual's ability to resist or recover from infectious disease through numerous pathways.

Water accessibility and competing demands

Even when physically available, there are many challenges for households to access water that include: high cost, dangers involved in acquisition, or physical inability to haul it home due to age, illness, pregnancy or safety concerns^{3,10}. These challenges can intensify dramatically as a consequence of mass migration, with displaced people and those affected by conflict lacking access to water and sanitation infrastructure. When water is difficult to access, individuals and families are confronted with challenging decisions about how to use water, such as deciding between purchasing water or purchasing food, irrigating crops or watering animals, or, as the recent COVID-19 pandemic highlights, consuming water or using it for handwashing¹⁰. Additionally, the time spent fetching water presents multiple opportunity costs, including limited time for income-generating activities, missing school and potentially reduced purchasing power for sanitation products¹⁰.

Many households in the Household Water Insecurity Experiences (HWISE) study (Fig. 1) cited issues with water availability, accessibility and quality as the main barriers to regular handwashing³. For example, those living in arid and semi-arid environments experienced perennial water scarcity due to fluctuations in precipitation and groundwater recharge. However, survey results highlighted that the inability to wash hands was not dependent solely on physical hydrological constraints. For instance, the Democratic Republic of Congo (DRC) and Colombia are classified as 'water-rich' areas¹¹, yet many households in these locations experienced problems with water that limited handwashing ability (Fig. 1). Some households reported that available water was unaffordable or inaccessible due to physical (for example, preferred water source was too far away) and/or social constraints. Elsewhere, handwashing was forgone due to unexpected water shutoffs or contamination, while some households prioritized consumption over hygiene when water supplies were limited³.

Ways forward

The anticipated inability of many households to follow World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) guidelines during the COVID-19 pandemic reveals that major investments in both water infrastructure and water governance are critically needed to manage and provision water to ensure safe handwashing. We propose that strategic developments for reducing water insecurity aim for:

Improving water infrastructure and technologies

Ensuring source water protection is key. The adage that ‘prevention is better than cure’ applies here as protecting water sources from degradation is often cheaper and more effective than building storage infrastructure (for example, dams) and remediation post-pollution. Multi-barrier approaches based on adequate water treatment and distribution systems, water testing and training of water managers are proven methods to ensure safe drinking water¹².

This further includes developing technical solutions for the recycling and re-use of domestic wastewater such as rainwater harvesting, the re-use of grey water sources and managed aquifer recharge schemes. These technologies are of particular relevance for areas with low precipitation, strong hydrological seasonality and/or limited natural or infrastructural water storage capacity. Crucial for the success of these schemes are functional transmission and storage infrastructure, rigorous assessment of water quality, multiple-barrier approaches to protect the source water and early end-user engagement¹³.

There is a critical demand for improving water infrastructure to reduce water insecurity. While the use of technological solutions such as increased utilization of low-flow taps or sensors to reduce water waste holds great potential, the uptake of such technologies requires solutions for satisfying power demands, initial investment and maintenance costs.

Promoting behavioural change with stakeholders, communities and local leadership

The current COVID-19 pandemic has increased appreciation for hygiene globally and may serve as an opportunity to change behaviours. Besides awareness of known needs for cultural embeddedness¹⁴, future behavioural change approaches for promoting frequent handwashing may benefit from adopting business strategies, including partnering with existing institutions and leveraging shared ambitions to deliver corporate social responsibility. Even for communities with continuous access to stable water supplies currently, rethinking the value of water (as a multi-purpose resource) and how to use it sustainably is required urgently. Climate change and population projections suggest that current water systems are unlikely to meet future water needs; consequently, household water insecurity is likely to become more prevalent. In that respect, overreliance on commercially bottled water can quickly become self-perpetuating and disincentivize investment in sustainable water infrastructure¹⁵.

Experiences of water pollution, in particular when not detectable visually, increase scepticism about the management of water systems and may cause lasting negative impact on the perceived trustworthiness of water resources. In fact, reports of rural communities not using improved

water supplies due to their doubts of provided tap water quality¹⁶ indicate the challenges of building trust alongside securing safe water supplies. As decisions on water management and sanitation development objectives, as well as the allocation of human and financial resources, are often taken or influenced by political and community leaders at all levels, advocating for inclusive solutions across these different levels is essential. Formation of local stakeholder and expert panels is likely to increase objectivity and credibility of findings, as well as improve public perception about and adherence to the recommendations.

Providing water-independent sanitation alternatives

Fewer than 19% of people in LMICs use soap routinely¹⁷, highlighting the critical need for better sanitation opportunities and education as a driver of behavioural change. However, as revealed by the HWISE study, handwashing opportunities vary across regions (Fig. 1) and probably within households. Hot spots (regions) and hot moments (periods) of insufficient water access, quality or availability for handwashing will be inevitable with climate change. Thus, it is paramount to develop and widely deploy prognostic tools, such as the HWISE Scale, to understand the likelihood of extreme scenarios that require targeted relief operations, such as temporary taps or widespread use of alcohol-based sanitation products when handwashing becomes impossible.

Spatially detailed and explicit global data, such as those generated by the HWISE study³, are required to enable identification and prioritization of the most-at-risk groups worldwide. While data presented herein focus predominantly on LMICs, it is important to note that many more groups globally are made vulnerable to the negative repercussions of water insecurity — including migratory communities, displaced persons, minority ethnic groups and indigenous communities.

A look ahead

Although this Comment is written in the context of the COVID-19 outbreak, problems with water availability, quality and access are ever-present for many people globally. Water insecurity has consequences for the mental, physical, nutritional and socioeconomic well-being of billions. Never has the urgency of the call for action on SDG 6, to “ensure availability and sustainable management of water and sanitation for all”, been so evident and meaningful to so many people. In light of this pandemic, it is clear that the human right to water for consumption is not being met.

As we consider what must be done to make the SDG 2030 Agenda a reality and better prepare societies for future global health crises, we encourage policymakers and programme implementers to prioritize WASH and consider holistic solutions that address each facet of water insecurity (water availability, quality and accessibility).

COVID-19 Pandemic Should Be A Wake-Up Call For Water Security

August 25, 2020 Northwestern University

<https://scienceblog.com/518121/covid-19-pandemic-should-be-a-wake-up-call-for-water-security/>

Urgent action on water security is essential to better prepare societies for future global health crises, say researchers at the University of Birmingham in the UK and Northwestern University.

In an opinion piece published in Nature Sustainability today (Aug. 24), researchers are urging policy makers across the world to focus on behavioral change, knowledge promotion and investment in water infrastructure.

The call to action follows studies revealing nearly a quarter of households in low- and middle-income countries have been unable to follow basic guidelines on handwashing, which is recognized as critical for preventing the spread of the coronavirus pandemic.

The studies were conducted by the Household Water Insecurity Experiences – Research Coordination Network funded by the National Science Foundation. HWISE – RCN is an international community of interdisciplinary scholars and practitioners working in the field of water insecurity.

“The COVID-19 pandemic has laid bare the urgent need for global action on water security,” said Professor David Hannah, who holds the UNESCO Chair in Water Sciences at the University of Birmingham’s School of Geography, Earth and Environmental Sciences. “This is a basic human right that is not being met in large sections of the world’s population, and COVID-19 has provided us with a wake-up call that we cannot afford to ignore.”

“This is a great example of how our HWISE scale, which measures household water insecurity experiences, makes visible the often invisible crisis of water insecurity,” said Sera L. Young, associate professor of anthropology in the Weinberg College of Arts and Sciences at Northwestern and faculty fellow with the University’s Institute for Policy Research.

“Inequalities in access to a resource fundamental for existence, and for preventing transmission of COVID, must not continue. My co-authors and I lay out some key actions that can make the world more water secure, and safer for us all,” she said.

Specific areas to address include:

Improving water infrastructure and technologies

Protecting water sources is key to ensuring safe drinking water. Approaches should include

adequate water treatment and distribution systems, as well as methods for recycling and reusing domestic wastewater and rainwater. These sorts of measures may be more cost effective than building expensive new infrastructures such as dams or purifying water after it has become polluted.

Promoting changes in behavior

Local leaders and communities should grasp the opportunities to promote and embed good hygiene behaviors in the wake of the COVID-19 pandemic. This includes rethinking our appreciation of the value of water and how to use it sustainably. This is important since future predictions on climate and population change mean even communities with good access to water may face an uncertain future.

Promoting alternatives

Predicting and planning for relief efforts such as temporary taps or hand sanitizer products will be increasingly important as climate change and population growth progress. Opportunities for handwashing vary widely across regions and even within households, so hotspots (areas with insufficient clean water) and hot moments (periods of time when clean water is inaccessible) need to be adequately forecast and prepared for.

“The COVID-19 pandemic may serve as an opportunity to change behaviours,” said co-author Iseult Lynch, professor of environmental nanosciences, University of Birmingham. “For example, over-reliance on commercially bottled water can quickly become self-sustaining and disincentivise investment in sustainable water infrastructure. Rethinking the value of water as a multi-purpose resource and how to use it sustainably is required urgently.”

“Both the World Health Organization and UNICEF acknowledge the scale of this challenge,” added co-author Stefan Krause, professor of ecohydrology and biogeochemistry, University of Birmingham. “Water insecurity has consequences for the well-being — both mental and physical — of billions of people. The costs of not preparing for future crises will be catastrophic.”

“[Water and sanitation for all in a pandemic](#)” published in Nature Sustainability. Additional co-authors include Feng Mao, Cardiff University (UK), and Joshua D. Miller, Northwestern University.

Navajo 'Water Warrior' Drives Miles During COVID-19 To Deliver To Those In Need

By Misha Jones and Jacqueline Robledo, Cronkite News

Published: Tuesday, August 25, 2020 - 7:25am

Updated: Tuesday, August 25, 2020 - 2:48pm

<https://fronterasdesk.org/content/1612321/navajo-water-warrior-drives-miles-during-covid-19-deliver-those-need>

When the sun is up, he's up and ready to hit the road by 8 a.m. Flatbed trucks are loaded with brimming barrels of water, and the teams take off — up and down the burnt orange washboard roads that crisscross the Navajo Nation Reservation.

Zoel Zohinnie grew up on a ranch in these vast lands, knowing what it's like to live without running water, knowing what it means to drive for miles to fill up at a community water station and then haul it back home.

“For some families, it's a whole day of leaving home, waiting in line, coming back, unloading,” he said. “Just to drink water and have water for living.”

When the COVID-19 pandemic arrived on the reservation, Zohinnie saw families and elders sheltering in place – and no one helping them to haul water they desperately needed.

“So I took up a PayPal and purchased a water tank, put it in the back of my truck and hit the road, and ended up doing that day after day,” said Zohinnie, who calls his group Water Warriors United.

Water is a precious commodity that's scarce in many places across the U.S. but even more so in rural Native American communities like the Navajo Nation, where a virus that requires hand-washing and proper hygiene has taken an especially heavy toll.

Zohinnie, 42, is a boilermaker by trade, doing pipe welding, power plant maintenance and refinery construction. But he was laid off at the end of March, just as COVID-19 cases began increasing across the sprawling reservation.

He has underlying health conditions that put him at higher risk of contracting COVID-19 and suffering more. But as the virus that causes the disease took hold of Dinétah, he knew he had to find a way to help, even while practicing social distancing and staying safe.

His is the story of how one person saw a problem that needed a solution and started a movement to try to find one — as a friend said, “Changing the world one barrel at a time.”

A Scarce Resource

A November report released by the nonprofit US Water Alliance found that more than 2 million Americans lack access to running water, indoor plumbing or wastewater services.

Those disparities are worse in communities of color and even more extreme, the study found, among Indigenous people — whose households are 19 times more likely to lack indoor plumbing than those of white families.

On the Navajo reservation, which stretches 27,000 square miles through Arizona and into New Mexico and Utah, an estimated 30% of the 174,000 residents lack access to running water. Many, the US Water Alliance report said, have less than 10 gallons of water in their homes at any given time, sometimes using as little as 2 or 3 gallons a day. The average American uses 88 gallons a day.

Some residents drive hours to get water to haul home, ration what water they do have between hygienic uses and cooking, or stockpile it in case of emergency.

One woman, the report noted, has bartered homemade pies for water.

These obstacles often force residents to travel to towns bordering the reservation to buy water, said Monica Harvey, a Navajo who founded Defend Our Community, a group working to assist elders during the pandemic.

Harvey, who lives in Leupp, points to other problems, such as broken windmills that hinder water pumping and limited hours at tribal chapter houses, the government subdivisions and communal gathering places where Navajos often get their water.

“There was one point ... where the chapter house in Leupp was announcing that they were going to shut down a water station,” Harvey said. “The water from that water station is for livestock only. But sometimes, residents have to resort to that water to drink.”

A report by the Navajo Nation’s Department of Water Resources notes that a lack of reliable drinking water “stifles economic growth throughout the reservation” while contributing to higher incidence of disease.

Add an extremely contagious virus into this mix and the circumstances become even more dire, experts note.

“You can imagine if you don’t have access to running water, then the very basic things you need to do to stay home and stay safe during a viral pandemic aren’t possible,” said George McGraw, founder of DigDeep, a nonprofit that works on the reservation to bring running water into homes and schools.

“You can’t wash your hands for 20 seconds several times a day with soap and water. You’re constantly being forced to leave social isolation ... to drive to a grocery store that’ll have bottled

water ... or to drive to a gas station, a truck stop, a school, a library — if they're open — to take a shower or collect water.”

Cynthia Harris, director of tribal programs at the Environmental Law Institute in Washington, D.C., said the long-standing issues around access to water and water quality in Indian Country can be boiled down to three main obstacles: resources, logistics and battles over water rights.

Funding for infrastructure improvements is limited. The Indian Health Service reported last year a backlog of almost 2,000 sanitation-related construction projects in Indian Country and estimated it would cost \$2.7 billion to provide all American Indians and Alaska Natives with safe drinking water and adequate sewerage systems.

The rural nature of homes also makes for logistical challenges. On the Navajo reservation, which is bigger than the state of West Virginia, many households are not good candidates for centralized water systems because extending water lines to low-density, mountainous areas is extremely expensive, according to Harris' group.

“We've heard quite a bit from Congress and the executive branch about looking at infrastructure, ensuring that tribes are included in that at a sufficient level,” Harris said, noting some opportunities to address these issues may be part of the \$2.2 trillion coronavirus relief package known as the CARES Act.

“There is a toolbox,” she said. “The question is, which tools bring to bear ensuring tribes are included.”

The Navajo Nation has received \$714 million under the CARES Act, and President Jonathan Nez has proposed using \$300 million of that for agriculture projects and water infrastructure, including improved residential plumbing.

Final expenditures are being negotiated between the Navajo Nation Council and Nez. But time is running out: The federal government is requiring that CARES Act funding be spent by year's end.

A Hand For The Forgotten

“We will never be able to measure the magnitude of language, culture, or history that this virus has taken from our tribes. ... We have already lost so much, but are also collectively doing so much.”

Zoel Zohnnie's words punctuate the website of Collective Medicine, the nonprofit that serves as the umbrella organization for his Water Warriors United campaign. The effort has grown from one man and one water tank to an operation where volunteers deliver on average 5,000 gallons a week to residents across the reservation.

“The idea behind this whole campaign ... was to reach the people who can’t get to the water themselves, and to reach the people who are ... far away enough to have been forgotten,” Zohnnie said.

“And there’s been a lot of people that have been forgotten.”

The more he ventured out, the more donations started flowing in. He used the money to buy 55-gallon water barrels for Navajos living out of 5-gallon buckets or small containers.

Zohnnie now has four 16-foot flatbed trucks that carry 550-gallon tanks, hoses, equipment and a water pump. His team has delivered more than 400 barrels and more than 100,000 gallons of water to more than 20 communities.

“Now what we’re trying to do is figure out a refill system for the places we’ve already been, so that we can just go back to these homes and kind of recirculate where we’ve already been,” he said. “But if we do that, then it takes away from us being able to reach other areas that haven’t been given barrels yet.

“So we’re trying to get as many barrels out there as possible, first, so that way at least the residents and our elders and tribal members can have a barrel. That makes their life a little easier when they have to haul water for themselves.”

Along the way, Zohnnie has met dozens of people, many whose circumstances brought tears to his eyes. One family of 18 was living in a small shack with no running water. Another home included several children living alone without water or electricity.

“The dad had passed away probably four months ago, and the mom had passed away two months before that,” he recalled. “So the kids were just trying to make their way, and there was nobody that was really helping them.

“That was one that kind of stuck with me.”

Another man was caring for his 90-year-old mother, who requires a feeding tube. They lived off a 20-mile dirt road and were unable to haul water on their own because the man couldn’t leave his mother for the time it would take to go out and return.

This family hauled water by 5-gallon containers. The Water Warriors gifted them two, 55-gallon drums. The group has delivered more than 400 barrels of water. (Photo courtesy of Water Warriors United)

“It’s been quite an eye-opener,” Zohnnie said. “Growing up on the reservation, you kind of know what’s going on. But until you’re there visiting each home, talking to each person, it never really hits you until you hear them or you look at them in the eye and see how they feel.”

Harvey’s group, Defend Our Community, began collaborating with Zohnnie to get water to the elders it works with.

“It was very difficult for elders throughout the community to get drinking water, so his team came out and was able to provide 55-gallon water barrels with drinking water,” she said. “They had a water tank in the back of their vehicle as well. So elders who needed water jugs or containers filled, they were able to help fill those containers with drinking water.

“A lot of them were so grateful ... that a few of the elders broke into tears because they received help. Finally someone showed up to help them, to provide aid to them.”

Zohnnie’s effort is just one of several, and Harris and others note that any permanent solutions to the water access issues must go beyond trucking in gallons here and there. The pandemic, Harris said, is “an opportunity to stop, to pause, to reflect and consider these issues and look at how we can do better.”

Zohnnie hopes to continue his initiative beyond COVID-19, to keep helping his people in whatever way he can. He wants the world to see that not all that’s come from the pandemic is sorrow and tragedy.

“I feel like because of this virus, there are beautiful things happening,” he said. “And I think one of them is the fact that it has brought a lot of people together.

“There’s a lot of people still out there suffering from it, still out there protecting themselves from it, too.”

But, he added: “Even though it’s a dangerous and ugly virus, it has done beautiful things to help people see that we can come together in times of crisis.”

The Tricky Task of Smelling and Tasting Drinking Water

ARTICLE Aug 26, 2020 | By Aaron Whittlemore, Virginia Tech

<https://www.technologynetworks.com/applied-sciences/articles/the-tricky-task-of-smelling-and-tasting-drinking-water-339070>

You walk inside on a hot day. You're thirsty. You immediately head to the sink and fill a glass with tap water. You bring it to your lips, and experience the wonderful feeling of quenching thirst. "Wow," you think, "this water tastes great." It's fresh and clean—it's what water should taste like.

But what happens when the water doesn't taste right? Just as we've all experienced how refreshing a glass of water can be, we've likely had an opposite experience. When you drink water with a poor flavor or smell, it can often be hard to place what's making it unfavorable—it's simply "wrong".

Taste and odor issues in drinking water—also called aesthetic water quality issues—are usually brought to the attention of water utilities by their customers. However, when customers reach out to report an aesthetic water quality issue, it is often difficult for them to describe what's wrong with their water. Many customers give little detail, claiming that their water tastes or smells different, unable to attach specific descriptors to their senses. Water utilities are interested in improving the dialogue between customers and their personnel, because it leads to quicker resolution of aesthetic issues while using less resources.

The [Virginia Tech Water INTERface Interdisciplinary Graduate Education Program \(IGEP\)](#) team is tackling this problem by furthering the knowledge of taste and odor issues in drinking water and improving consumer-utility dialogue on aesthetic water quality issues. "We too often take tap water for granted," says [Andrea Dietrich](#), a professor in the Civil & Environmental Engineering Department at Virginia Tech and co-director of the Water INTERface IGEP. "Tap water is a valuable and healthy resource, and occasionally encounters an aesthetic issue. An interdisciplinary team approach is required to correct those issues and efficiently regain that clean, refreshing water we're used to. Customers, engineers, and scientists are all on the team." The first step to better resolving these issues is understanding why they're difficult in the first place.

The complexities and difficulties of describing water taste and odor issues

The human senses are inherently complex. Our sense of taste is restricted to five distinct categories: sweet, sour, salty, bitter, and savory/umami. Most humans can readily differentiate between the five tastes, but individuals will vary in their ability to do so, and when combinations of taste are mixed, as in a beverage, it becomes more difficult to describe.

While there are only five distinct tastes, it is theorized humans can detect over one million distinct types of smell. Think about that for a second—if you smell something in your water, there are potentially one million different options for what you could be experiencing. Now think about narrowing those one million options down to a couple of words to describe what you’re sensing. That’s likely to be a daunting task for anyone.

Most people attempt to make this task easier by searching their memory for familiar flavors they have experienced in the past, and describing new sensory experiences based on the familiar. Some chemicals with familiar smells, such as hydrogen sulfide which gives off a “rotten egg” odor, are easy for people to identify and describe. However, tastes and odors in drinking water may be caused by chemicals that enter the water that are not familiar. Less familiar chemicals have a much more varied array of descriptors and are especially hard for consumers to describe.

Finally, even when consumers can identify a taste or odor and describe it, their terminology may be very different from one another. “People will use different words to describe the same experience. We need a common language to describe our senses in a useful way,” says Renata Carneiro, a Virginia Tech doctoral student in the Food Science and Technology Department and Water INTERface IGEP fellow.

Gary Burlingame, the director of the Bureau of Laboratory Services for the Philadelphia Water Department (PWD), has direct working experience with these issues. In the 1990s, an algae that gave off a cucumber-like smell was affecting Philadelphia’s drinking water. Customers called in complaining of a wide range of smells, but most had little resemblance to cucumber. During a PWD learning event, six high school students were given a sample of the off-flavored water and asked to smell and describe the sample. Similar to PWD customers, most struggled to describe the odor. One student suggested that the sample smelled like cucumber, but the others disagreed saying that such a smell would not be found in tap water. Burlingame attributes this to consumer expectations. “People have expectations for what’s in a product. If it’s unusual, they have trouble describing it. No one expects their tap water to smell like cucumber.” Of course, that one student was correct. Because the cucumber smell is not associated with expected drinking water odors, the others had difficulty in acknowledging the cucumber smell and instead searched their memory for logical alternative descriptors.

Improving customer descriptions of water taste and odor through novel methods

After experiencing similar, recurring issues, the PWD partnered with Water INTERface researchers at Virginia Tech to find ways to help customers better describe taste and odor issues in their water.

The PWD determined there were 21 different chemicals of interest for drinking water taste and odor issues that could someday affect Philadelphia's water. After identifying these chemicals, Burlingame collaborated with Virginia Tech and Dietrich to comb through hundreds of studies and resources to find common descriptors for the taste and odor of the 21 chemicals. Because chemicals had many and various descriptors from the multitude of sources, word clouds were generated to visualize the dominant and minor descriptors for each chemical. Some chemicals featured word clouds with many different descriptors, while others had one or few descriptors, representing the variation of consensus in different chemicals' descriptors.

In this study, the check-if-apply list was given to 75 adult volunteer subjects who evaluated seven drinking water samples by tasting them. One sample was pure bottled water, two were tap water, and the other four contained either tap water or bottled water with one of four different chemicals commonly found in drinking water and known to cause aesthetic water quality issues. Subjects were asked to taste each sample and then check the line by descriptors on the check-if-apply list that applied to that sample.

Subjects consistently checked different descriptors on the check-if-apply list for each of the different samples, showing that they identified different flavors between the samples. The vast majority of subjects also reported the check-if-apply list as "somewhat easy" to "very easy" to use. Carneiro attributes this to the simple structure of a list. "A list of words is easy for people to read and relate to," she says. Virginia Tech researchers hope that utilities will begin making check-if-apply lists more accessible to customers. If customers can reference this simple list while identifying taste and odor issues in drinking water, it will likely lead to a quicker and more effective response in addressing the problem.

The PWD plans to implement the check-if-apply list into PWD protocol for handling aesthetic water quality issues. Currently, aesthetic water quality issues are usually identified by customers who then call the PWD to report the problem. Their trained staff ask questions to determine what may be causing the issue, hoping to identify a specific chemical or substance that may be the root cause before sending a staff member to test the customer's water. Here, the check-if-apply list could help refine how PWD personnel ask questions. By referencing the check-if-apply list, staff could quickly narrow down a customer's sensory experience to specific descriptors that may help

to identify the possible chemical causes of the taste and odor issue. Using the list could significantly decrease the time spent addressing aesthetic water quality issues which would allow for more focus on other important issues of customer concern like monthly payments, water pipe issues, and more.

Check-if-apply lists are actually a simplified and focused version of a long-standing tool used by the professional drinking water industry—the Drinking Water Taste-and-Odor Wheel (T&O Wheel). The drinking water industry has been using the T&O Wheel as a reference for standardized descriptors for aesthetic water quality issues since its inception in the late 1980s. The T&O Wheel describes eight major categories of odor and four major categories of taste. These categories make up the innermost circle of the wheel and are related to a second circle that contains specific descriptive words associated with each category. Finally, the third and outermost circle associates the categories and their descriptors with one or more specific chemicals. This allows water industry professionals to communicate quickly with each other, even globally, about what chemicals may be in drinking water based on its taste or odor.

However, consumers do not usually have access to the T&O wheel when they notice an aesthetic water issue. Virginia Tech Food Science and Technology postdoctoral researcher, and former Water INTERface IGEP fellow, Katherine Phetxumphou thinks this should change.

Phetxumphou led a study that tested consumer’s ability to describe odorants with and without the use of the T&O Wheel. Study subjects were first asked to smell four different odorants that are commonly found in drinking water and record descriptions for each. Then, two months later, the subjects again sniffed and described each of the odorants. This time, however, they were briefly introduced to the T&O Wheel and were asked to use it to help them describe each odorant. The results were promising—subjects were better able to describe three of the four odorants when using the wheel. Furthermore, nearly all subjects reported that they preferred having the T&O wheel to assist them in identifying the odorants. “When you have a sensory tool available to you, it’s easier and more accurate for you to describe what you’re smelling,” Phetxumphou explains.

Both Virginia Tech Water INTERface IGEP researchers and the PWD acknowledge that granting customers access to the tools themselves could be especially helpful. They would like to see tools like the T&O Wheel and check-if-apply lists sent out to customers via billing statements, emails, water quality reports, or even an app. Regardless of how customers are granted access to these tools, it is likely to improve consumer confidence in tap water and utility response in addressing aesthetic water quality issues. “The closer we can get to customers realizing there’s something in the water that shouldn’t be there, and describing it with relatable terms of smell and taste, the closer we are to getting these issues resolved efficiently and effectively,” says Burlingame.

Through their work, researchers from the Virginia Tech Water INTERface IGEP have identified descriptors that pertain to common chemicals known to cause drinking water taste and odor issues, tested the validity of tools that can be used to aid utility and customer description and response to such issues, and theorized ways that these tools could be used in the drinking water industry. This research makes important strides in the drinking water taste and odor field and serves as a great example of applicable, collaborative research that makes a difference. Dietrich noted that the drinking water community is an open community—it shares experiences and knowledge with other utilities around the country and around the world. Before long, the outcomes of Virginia Tech Water INTERface research could be spread far and wide. Perhaps you may even notice a check-if-apply list or T&O Wheel included in your next water utility bill or water quality report.

Improving aesthetic water quality is one of the many issues in our world that interdisciplinary research can help to solve. Burlingame said it best, “Yes there will be problems, but as long as we can work together to solve them, science advances, and people learn from it.”

Will COVID-19 kill public drinking fountains?

Advocates say they are necessary public infrastructure and must stay accessible

Jennifer La Grassa · CBC News · Posted: Aug 27, 2020 7:00 AM ET | Last Updated: August 27

<https://www.cbc.ca/news/canada/windsor/windsor-public-drinking-water-fountains-1.5700435>

When was the last time you drank from a water fountain?

If you live in the City of Windsor, the last time a public spout quenched your thirst was likely 2019.

Since the start of the COVID-19 pandemic, all of Windsor's 18 outdoor public drinking water fountains have been switched off, along with nearly 200 others located inside city buildings and city-run facilities.

This has been the case in many municipalities across Ontario due to recommendations from public health officials, but some poverty advocates and public policy experts say access to water should be prioritized.

And with Windsor in the middle of yet another heat warning — its 10th one this summer, the highest number of warnings the city has seen in recent years, according to Environment Canada — it's left people experiencing homelessness with fewer options to stay hydrated.

"It's vital, access to water is a fundamental determinant of health and a basic human right," said Kate Mulligan, director of policy and communications at the Alliance for Healthier Communities in Toronto.

"People who are living without access to a home not only are facing risks around water, sanitation and hygiene —the most basic defences against COVID-19 — but also don't have that fundamental feeling of belonging in the community that we all need," Mulligan said.

Mulligan, who is also an assistant professor at the Dalla Lana School of Public Health at the University of Toronto, said she's read the infection prevention and control measures that are used for public drinking water fountains across Ontario.

After reading these protocols, she said her understanding is the risk of getting COVID-19 from public water fountains is "quite low."

Fountains not 'entirely safe': public health

But Dr. Wajid Ahmed, Windsor-Essex's medical officer of health, told CBC News that the fountains do create the possibility for people to come into contact with the virus. He said since it's not known if water can transmit the virus, he can't say it's "entirely safe."

There simply isn't enough information available either way, he said.

"We don't know that if drinking water from a water fountain would put you at a risk of COVID," Ahmed said.

Meanwhile, the city's senior manager of parks James Chacko said if the city were to reopen fountains, it would be hard to keep them clean.

"It's very difficult, if not impossible, for us to maintain any sort of cleanliness and disinfecting protocols in place for those," he said.

Splash pads open before water fountains

Mulligan says shutting the fountains was understandable at the start of the pandemic, but at this stage it's unacceptable.

"[Some jurisdictions had] splash pads opened before the water fountains that were adjacent to them and that's not necessarily the most equitable response when there are people who really need access to the basic drinking water," she said.

"I think there's no strong argument at this stage, given this particular health condition, to revoke people's access to a very fundamental health need," said Mulligan.

It's just another way of excluding people from their community, Mulligan added.

"Offering water in many different kinds of places where many different kinds of people can gather is one expression of community belonging and solidarity at a time when we really need it," she said.

At this point she said cities should be having conversations around these issues and getting to the root of the problem, which is a lack of housing.

Some other municipalities in Ontario, like Sudbury, [Toronto](#) and [Halton](#) have either opened their fountains or created guidelines around public washroom and fountain maintenance during COVID-19.

After a petition from locals, the City of Greater Sudbury decided to re-open one of its outdoor public drinking water fountain at the end of July for those who are homeless.

At this time, Chacko said the city is following guidance from local public health officials and will continue to do so when it comes to reopening fountains.

Chacko said there's no maintenance costs to keeping the fountains turned off and the city has yet to discuss what it will do with the fountains in the long term.

In the meantime, Chacko said the city opened up a temporary respite for people at Windsor's Water World.

But Mulligan said this isn't good enough.

Local homelessness advocate Christine Wilson-Furlonger added that centralizing resources for those who are homeless in one area could be worse when it comes to COVID-19.

"Certainly all that does is cause more congestion of people in one area, forcing all the homeless to go in one location," Wilson-Furlonger said.

GivePower's solar power plant turns ocean water into drinking water

BY VICTORIA LOSKUTOVA ON AUGUST 27, 2020

<https://gritdaily.com/givepowers-solar-power-plant-turns-ocean-water-into-drinking-water/>

Often we forget to be grateful for the standard of living that we have: perfectly designed homes, great quality food, clean drinking water. More than 2 billion people have no such privileges. 2.5 billion people don't have access to improved sanitation, and 750 million lack fresh, drinkable water.

In some countries, people have to drink dirty or salty water from the ocean, because they have no choice. What's the result? All kinds of diseases: ulcers on the skin, failed kidneys and other organs, and death.

GivePower provides solar energy solutions to developing regions that need them the most. They installed the first-ever solar power plant that transforms ocean water into clean drinking water! 35,000 people can slake their thirst 24/7 with the fresh water that these solar plants produce.

The pilot test of the first solar power plant that GivePower installed had massive success in August 2019 in Kiunga, Kenya. Before that people had to bathe, wash their clothes in, and drink salty water.

It was regrettable to see all those children who got scars on their stomachs and knees because of the salt in their wounds. This water was poisoning all of the people who live there — Hayes Bernard, president at GivePower

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WHERE BY DID EARTH'S DRINKING WATER ARRIVE FROM? ANALYZE CASTS QUESTION ON THE EXISTING METEORITE THEORY

Posted On: August 28, 2020 By: Marsh Tyler

<https://www.prudentpressagency.com/where-by-did-earths-drinking-water-arrive-from-analyze-casts-question-on-the-existing-meteorite-theory/>

Drinking water addresses 70 % of the Earth's surface area and is essential to daily life as we know it, but how it acquired listed here has been a longstanding scientific debate.

The puzzle was a phase closer to currently being solved Thursday immediately after a French team noted in the journal *Science* they experienced recognized which room rocks were accountable, and prompt our planet has been damp at any time considering the fact that it shaped.

Cosmochemist Laurette Piani, who led the analysis, advised AFP the findings contradicted the commonplace concept that water was introduced to an originally dry Earth by significantly-achieving comets or asteroids.

According to early designs for how the Solar Technique arrived to be, the large disks of fuel and dust that swirled all over the Solar and finally formed the inner planets had been as well incredibly hot to maintain ice.

This would reveal the barren situations on Mercury, Venus and Mars – but not our blue earth, with its large oceans, humid environment and effectively-hydrated geology.

Experts hence theorized that the water arrived alongside immediately after, and the key suspects had been meteorites known as carbonaceous chondrites that are prosperous in hydrous minerals.

But the trouble was that their chemical composition doesn't carefully match our planet's rocks.

The carbonaceous chondrites also fashioned in the outer Photo voltaic Method, earning it less probable they could have pelted the early Earth.

Planetary creating blocks

A further group of meteorites, known as enstatite chondrites, are a a lot nearer chemical match, that contains identical isotopes (sorts) of oxygen, titanium and calcium.

This indicates they have been Earth's and the other internal planets' creating blocks.

Nonetheless, because these rocks fashioned close to the Sun, they had been assumed to be way too dry to account for Earth's rich reservoirs of H₂O.

To examination no matter whether this was actually correct, Piani and her colleagues at Centre de Recherches Petrographiques et Geochimiques (CRPG, CNRS/Universite de Lorraine) applied a strategy referred to as mass spectrometry to evaluate the hydrogen content material in 13 enstatite chondrites.

The rocks are now fairly unusual, producing up only about two percent of identified meteorites in collections, and it is hard to come across them in pristine, uncontaminated problem.

The team uncovered that the rocks contained ample hydrogen in them to provide Earth with at minimum a few moments the water mass of its oceans – and maybe significantly more.

They also calculated two isotopes of hydrogen, mainly because the relative proportion of these is pretty distinctive from one particular celestial object to a different.

“We found the hydrogen isotopic composition of enstatite chondrites to be very similar to the a person of the H₂O saved in the terrestrial mantle,” stated Piani, evaluating it to a DNA match.

The isotopic composition of the oceans was uncovered to be dependable with a mixture that contains 95 p.c of H₂O from the enstatite chondrites – much more proof these had been accountable for the bulk of Earth's drinking water.

The authors more uncovered that the nitrogen isotopes from the enstatite chondrites are related to Earth's – and proposed these rocks could also be the source of the most abundant ingredient of our environment.

Piani added that investigation will not exclude later on addition of water by other resources like comets, but suggests that enstatite chondrites contributed significantly to Earth's drinking water spending plan at the time it formed.

The work “delivers a vital and sophisticated factor to this puzzle” wrote Anne Peslier, a planetary scientist for NASA, in an accompanying editorial.

EPA awards \$1.6M for IU research on synthetic chemical exposure in rural drinking water

FOR IMMEDIATE RELEASE

Aug. 27, 2020

<https://news.iu.edu/stories/2020/08/iub/releases/27-epa-awards-grant-for-synthetic-chemical-exposure-in-drinking-water.html>

BLOOMINGTON, Ind. -- The U.S. Environmental Protection Agency has awarded Indiana University funding to further understand exposure risks of rural communities to per- and poly-fluoroalkyl substances, known as PFAS, through their drinking water.

The \$1,584,420 grant will support the joint research project conducted by the IU School of Public Health-Bloomington and the O'Neill School of Public and Environmental Affairs. The effort is part of a nationwide effort to implement the PFAS Action Plan, which outlines concrete steps the EPA is taking to address PFAS and protect public health.

IU is leading this project, which also includes RTI International, a nonprofit research organization in Research Triangle Park, North Carolina. IU will development a scalable platform for predicting PFAS occurrence in private wells to help understand exposure risks to rural communities that rely on private wells for drinking water. IU will test the accuracy of its predictions by comparing modeling predictions to private well samples collected nationwide through a citizen science campaign using mail-out test kits. The research is expected to substantially improve the accuracy of risk predictions and to facilitate informed risk management decisions.

Jacqueline MacDonald Gibson, chair and professor of the Department of Environmental and Occupational Health at the School of Public Health, is the principal investigator, while O'Neill School associate scientist Amina Salamova is co-principal investigator.

"Very few studies have tested private wells for PFAS contamination, but the few available studies have found these contaminants in more than half the wells tested," Gibson said. "PFAS are widely used in consumer and industrial products -- ranging from microwave popcorn bags to firefighting foam -- but we don't yet have good ways to predict which water supplies are most at risk. This project will help advance knowledge and provide practical tools so rural communities can know their risks."

PFAS are a group of synthetic chemicals that have been in use since the 1940s and are found in a wide range of consumer and industrial products. The researchers will investigate the occurrence of PFAS in rural wells as well as agricultural soils, wastewater and runoff water across the nation, shedding light on PFAS exposures in rural communities.

"Even though PFAS have been in use for decades, we still don't know much about their occurrence in the environment and specifically in drinking water," Salamova said. "This is a group of man-made chemicals that are very persistent in the environment and accumulate in animals and people, hence called forever chemicals."

Due to their widespread use, most people in the United States have been exposed to PFAS, though information on health effects is highly uncertain, according to the EPA.

Work on the project is expected to begin Sept. 1 and last for approximately three years.

IU Research

IU's world-class researchers have driven innovation and creative initiatives that matter for 200 years. From curing testicular cancer to collaborating with NASA to search for life on Mars, IU has earned its reputation as a world-class research institution. Supported by \$854 million last year from our partners, IU researchers are building collaborations and uncovering new solutions that improve lives in Indiana and around the globe.

Legionnaire's Bacteria Found in Drinking Water at Nine Reopened Schools

Jordan Davidson

Aug. 28, 2020 11:38AM EST

<https://www.ecowatch.com/legionnaires-drinking-water-schools-2647352885.html?rebelltitem=3#rebelltitem3>

In addition to taking precautions against the novel coronavirus, schools across the country find themselves needing to worry about a new scourge: legionella bacteria in their drinking water, according to The New York Times.

Recently, nine schools in Ohio and Pennsylvania found the harmful bacteria in their water. In Fox Chapel, PA, a suburb of Pittsburgh, four out of the town's six schools tested positive for the bacteria. Because the schools were unused for so long, nearly six months, the water just sat in the pipes and did not have a chance to move. That created a condition for the bacteria to thrive, according to WPXI News in Pittsburgh.

According to the Centers for Disease Control and Prevention, people get sick when they inhale mist that has the bacteria or they ingest water with the bacteria in it. It can cause severe pneumonia or lung infection, which is worrying when the nation is already grappling with COVID-19, an infectious disease that leads to severe pneumonia.

Similarly, schools outside of Dayton, Ohio found the bacteria in their water last week. In all of those cases, the outbreak was noticed in locations that were far from classrooms or drinking fountains, such as one faucet in a seldom used bathroom, according to Dayton Daily News.

"We would have capability to wash hands, we would provide drinking water, we have toilets that are working, and we have the ability to serve lunch," said superintendent Rob O'Leary, defending the district's decision to proceed with in-person instruction and to keep the schools open, as Dayton 24/7 reported.

O'Leary added that the school district ran disinfectant through all the school's water lines and cleaned the aerators on all of its faucets.

The Milton-Union school district, also in Ohio, received a federal grant to test its water over the summer. It found the bacteria in a drinking fountain and in two faucets on only the cold-water side, according to WHIO News in Ohio.

"Ice machines we tested it all," said Tim Swartztrauber, West Milton Water Supervisor and Chief Inspector to WHIO. "Luckily we did because we did find legionella. We tested every drinking

fountain and we got it in a drinking fountain. Without that this probably would have been missed."

Swartztrauber added that they ran chlorine through the system to disinfect it and then flushed out the chlorine to make the water safe again.

Andrew Whelton, an associate professor of civil, environmental and ecological engineering at Purdue University in Indiana, was involved in the study at the Milton-Union schools and said it would not have been possible without the federal grant. That leaves a question of how many schools across the country are not testing their water because they don't have the funds to do it, according to The New York Times.

"If somebody contracts legionella and legionnaires disease the exposure can be fatal," Whelton said to WHIO. "So it is serious."

It's highly unusual for schools to go for such an extended time without use. Even during the summer months, there's often summer school, sports practice, and custodial work being done.

"Schools generally do not have a water management plan," Whelton said to the New York Times. "There's a myth that most do. They don't in my experience."

Whelton told The New York Times that the bacteria would likely show up with greater prevalence if schools actually conducted tests.

"If parents haven't heard from their schools about whether or not testing is being conducted, then they should start asking questions," he said.

Boil order issued for Scofield after water tests positive for coliform

By Katie Workman, KSL.com | Updated - Aug. 30, 2020 at 7:41 p.m. | Posted - Aug. 30, 2020 at 6:31 p.m.

<https://www.ksl.com/article/50012137/boil-order-issued-for-scofield-after-water-tests-positive-for-coliform>

SCOFIELD — A boil order has been issued for Scofield following the water supply testing positive for coliform on Sunday, officials say.

The Department of Water Quality and Rural Water Association are working to resolve this issue by flushing and chlorinating the pipe, said Jared Mendenhall, spokesperson of the Utah Department of Environmental Quality.

Coliform is a type of bacteria that includes E. coli, according to a [water quality information page](#) on Utah State University's website, which also says "most coliform bacteria are harmless but their presence indicate the possible presence of disease causing bacteria, viruses or parasites from sources such as raw sewage."

The water supply serves 250 people, with 90 residential connections and two commercial.

The boil order is expected to last 72 hours, Mendenhall said.

When under a boil order advisory, individuals are encouraged to use bottled or boiled water for drinking and cooking, and to discard ice cubes. [The CDC](#) provides guidelines for washing dishes, doing laundry, and other usages of water.

Beaver County hopes to block neighbor's groundwater pumping project

By Brian Maffly

• Published: 5 days ago

Updated: 2 days ago

<https://www.sltrib.com/news/environment/2020/08/29/beaver-county-hopes-block/>

So much water has been pumped from under Utah's Cedar Valley over the years that the ground is sinking by as much as 1.2 inches a year, leaving cracks on the valley floor.

This is because the Central Iron County Water Conservancy District and other providers annually remove at least 7,000 more acre-feet from these aquifers than nature can replenish. So the district's solution is to build a \$250 million network of wells and pipelines that would extract water from under Beaver County's Pine Valley, a place that gets less than eight inches of rain, and move it 66 miles to Cedar City.

Thus opens the next battle in a long-running dispute between the two southwest Utah counties over precious water resources that both say they desperately need. The Bureau of Land Management last month initiated a comprehensive environmental analysis of the project, most of which would occupy public land.

The debate

Facing forecast water shortfalls, Iron County applied for the rights to the ancient groundwater under Pine and adjacent Wah Wah valleys in 2006. The state engineer's decision to award a combined 26,500 acre-feet a year has been the subject of prolonged litigation that was resolved last year in Iron County's favor when a "stipulated judgment" was reached.

"We feel we didn't get fair representation in the hearing with the state," said Beaver County Commissioner Mark Whitney. "We were bullied, so finally we settled with what we could settle for."

Not about to give up the fight, Beaver officials suspect there is not enough water under those valleys to sustain Iron County's appropriations. They argue the Pine Valley project could wind up sacrificing Beaver County's rural way of life for the sake of residential growth elsewhere. Springs could go dry, the water table could drop and fifth-generation ranchers could be looking for a new line of work.

"It could take up to 20 years before you know there is a problem with overpumping, but by then it's too late," Whitney said. Finding common cause with environmental groups and water user

groups, Beaver officials contend the project would simply turn a problem of Iron County's own making into Beaver County's problem with dire consequences for the people and wildlife that depend on Pine Valley's springs.

But according to Paul Monroe, the water district's executive director, many safeguards are in place to ensure against the disaster feared by Beaver County. Among Utah's fastest growing counties, Iron needs to tap Pine and possibly Wah Wah and Hamlin valleys' groundwater to meet future water demands, diversify regional water supplies and enhance supply reliability.

Other options the district explored proved impractical from an economic or environmental standpoint. Iron County, for example, was an initial participant in the proposed Lake Powell pipeline, but that project would have carried three times the estimated cost of the Pine Valley project, according to Monroe.

Whitney is frustrated that Iron County hasn't explored other options and even relinquished some of its existing resources that could have helped meet its needs.

"They could have bought farms up and transferred water if growth was so important for them," Whitney said. "Look at Kolob Reservoir. They owned all those rights and sold them to Washington County. That goes to show how silly and stupid they are. It wasn't like they didn't have options. So what do they do? They do the most unneighborly thing, they go and mine a sister county's water."

The Iron water district's service area is home to 50,000 people and its population is expected to double during the next 50 years. Without securing new sources, Iron County's growth will outstrip existing supplies, said Monroe.

The plan

The Iron water district proposes to drill 15 production wells and eight monitoring wells, all in Beaver County, that would feed up to 15,000 acre-feet of water a year into the pipeline. The piping would be 18 to 30 inches in diameter for the lateral lines tying the wells to the mainline, which would be up to 40 inches in diameter. The mainline would increase in diameter to 54 inches as it nears its southern terminus. The enlarged diameter is needed to accommodate water that could someday be connected to the pipeline in subsequent phases to capture groundwater extracted from Wah Wah and Hamlin valleys.

A solar array installed on 200 acres of private land would power the pumping stations. The water would be pushed uphill to an underground concrete tank built at the alignment's high point on the county line, and from there the water would gravity feed south to Cedar City. The line, built of high-density polyurethane and steel, would be buried under a permanent 50-foot-wide right of way. Two-thirds of the line and wells would be on public land, while other components would occupy private and state trust land.

Critics likened the project to Las Vegas' much larger bid to pump billions of gallons of groundwater from under Snake Valley on the Utah-Nevada state line and neighboring basins to feed that desert metropolis's seemingly insatiable thirst. Just a few months ago, however, Southern Nevada Water Authority formally abandoned that 30-year effort after legal setbacks and a realization that it could meet its needs through conservation and more efficiently marshaling existing water sources, according to Kyle Roerink, executive director of the Great Basin Water Network.

For years, that group fought the Vegas project and is now saddling up its legal cavalry to ride against the Pine Valley project. Roerink wishes Iron County would learn from Las Vegas' missteps and drop its claims to Pine Valley groundwater in favor of less costly alternatives.

"This is a project to feed sprawl in Cedar City," Roerink said. "This isn't a supplemental play here. It is a play to placate real estate developers and other monied interests."

The uncertainties

A recent study by the U.S. Geological Survey, concluded 19,500 acre-feet of groundwater a year move north out of Pine and Wah Wah valleys, or about 7,000 acre-feet less than what Iron County hopes to appropriate from these two basins. This suggests Iron's plans amount to unsustainable groundwater "mining," critics say.

Monroe acknowledged the uncertainty around the availability of water, but the district is assuming those risks, will conduct robust monitoring to detect trouble and take steps to protect water users should trouble arise.

"We are using the best science available to understand the water sources in that valley," Monroe said. "We are putting as much mitigation in place to make sure we aren't impairing senior water rights holders. We understand that if we do, we need to make them whole."

But Beaver County officials are not convinced and hired Simeon Herskovits, the New Mexico lawyer who had successfully represented the Great Basin Water Network in the Snake Valley fight, to help them oppose the Pine Valley project.

Herskovits and other critics contend the BLM's analysis must go beyond just the project's footprint on the ground, but also look at the effects of groundwater pumping on Pine Valley's wildlife, plant communities and farmers and the effects of the urban sprawl the water deliveries would enable.

"It includes potential air quality effects from increased erosion and dust emissions due to the lowering of the water table beneath springs, wetlands, wet meadows, lakes and reservoirs, and playas," Herskovits wrote in Beaver County's comments to the BLM. "Such increased dust emissions pose a serious threat to public health in communities across a broad swath of Utah and

eastern Nevada, from Garrison to Baker to Callao to Hinckley and Delta to Tooele to Salt Lake City and its suburbs.”

Monroe noted that it’s the water district’s statutory duty to plan decades into the future, not make judgment calls about how water should be put to use. Assuming the project wins approval, he expects it will be at least another 10 years before the pipeline is up and running and its costs will be borne by those receiving the water.

“Traditionally in Utah, we have always brought water to the people. Diverting water is what we do here. It was one of the first things the pioneers did in the Salt Lake Valley when they diverted water from City Creek,” Monroe said. “That doesn’t make it easy when water is diverted from your county, but ultimately water belongs to the state of Utah and the state awarded the rights to Iron County.”

Scofield residents must boil tap water after bacteria found in rural system

By Kathy Stephenson

• Published: 2 days ago

Updated: 2 days ago

<https://www.sltrib.com/news/2020/08/31/scofield-residents-must/>

Residents in the Carbon County town of Scofield were told to boil their tap water, after the system tested positive for two forms of bacteria.

Town leaders issued a 72-hour boil order on Sunday, after traces of coliform and E. coli were found during a routine drinking water test, said Jared Mendenhall, spokesman for the Utah Department of Environmental Quality.

“A sample came back that showed we needed to take a deeper look at what was going on,” he said, “and make sure human health is protected.”

On Monday, the source of the bacteria still had not been identified, Mendenhall said. Officials from the DEQ’s Division of Drinking Water along with local health leaders and the Rural Water Association of Utah are investigating “to see if one of the springs has an issue.”

About 220 residents who live in the rural town near Price are affected and will likely have to boil tap water — or use bottled water — until at least Wednesday, Mendenhall said.

Residents should boil all tap water for at least three minutes, to ensure that it is free of illness-causing organisms.

Water used for drinking or to prepare food, beverages and ice cubes needs to be boiled under the order. So does water used to wash fruits and vegetables or brush teeth.

The treatment is not needed for water used for showering/bathing or laundry.

New treatment removes more than 99% of hormones from drinking water

German researchers have succeeded in removing more than 99 % of steroid hormones from water using an improved filtration system made of polymer membrane with activated carbon.

1 September 2020

PETRA WIESMAYER

<https://innovationorigins.com/new-treatment-removes-more-than-99-of-hormones-from-drinking-water/>

For years micropollutants in water that cannot be removed by conventional methods have posed a global problem. As a result, drinking water is often contaminated with these kinds of pollutants. Steroid hormones are just some of the harmful substances. They end up in wastewater through drugs and contraceptives that people ingest.

While their percentage per liter of water is just a few nanograms, these substances can be harmful to health. Plus they impact the environment, even in these small quantities. However, up until now, they have been difficult to detect. That is due to their low concentrations and tiny sized molecules. Moreover, they cannot be filtered out of the water with conventional purification techniques.

European Commission's target value has been met

Researchers at the Karlsruhe Institute of Technology (KIT) have now developed an innovative filtration system. This combines a polymer membrane with activated carbon. It is a system that uses exceptionally small carbon particles. Which means that the target value of one nanogram of oestradiol (the physiologically most potent estrogen) per liter stipulated by the European Commission for drinking water can be safely met.

Developed by the KIT researcher for process engineering, Professor Andrea Iris Schäfer, (head of the Institute for Advanced Membrane Technology aka IAMT) and her team, this innovative process for the rapid and energy-efficient elimination of steroid hormones from wastewater uses a polymer membrane combined with activated carbon. "First, the water is forced through the semi-permeable membrane. This filters out larger impurities and microorganisms," Schäfer explains. "Then the water flows through the layer of carbon particles located behind it. This then binds the hormone molecules to it."

Researchers at the IAMT have now developed and improved this process in collaboration with the filter manufacturer Blücher GmbH in Erkrath (Germany). They were assisted by scientists from the Institute for Functional Interfaces (IFG), the Institute for Applied Materials (IAM), and the Karlsruhe Nano Micro Facility (KNMF) at KIT. “Our technology now makes it possible to achieve the target value of one nanogram of oestradiol per liter as stipulated by the European Commission for drinking water,” Schäfer reports.

Particle size and oxygen content are decisive

The researchers examined the processes involved in the activated carbon layer more closely. They also used carbon particles (*polymer-based spherical activated carbon – PBSAC*). “It depends on the diameter of the carbon particles”, clarifies Matteo Tagliavini from IAMT. He was the lead author of the latest publication. This was subsequently published in the journal Water Research. “The smaller the particle diameter, the larger the outer surface of the activated carbon layer that is available for the adsorption of hormone molecules.”

The researchers reduced the particle diameter of a two-millimeter thick activated carbon layer from 640 to 80 micrometers. This enabled them to remove 96 percent of the estradiol contained in water.

According to the scientists, the next step towards further improving the adsorption kinetics and removing more than 99 percent of oestradiol was achieved by increasing the oxygen content in the activated carbon. “The process ensures high levels of water flow at low pressure. It also works in an energy-efficient manner. Plus, it filters out a large number of molecules, produces no harmful by-products, and can be flexibly used in devices of varying sizes – from domestic taps to industrial plants,” Schäfer states.

EPA Hands Coal Industry a Pass to Dump Toxic Wastewater

September 01, 2020

<https://www.nrdc.org/experts/nrdc/epa-hands-coal-industry-pass-dump-toxic-wastewater>

The Trump administration rollback will contaminate waterways and drinking water sources—exposing people to pollutants like mercury, lead, and arsenic.

This week, the U.S. Environmental Protection Agency (EPA) formally weakened rules that dictate how coal-fired power plants must dispose of their toxic wastewater, which contains pollutants such as mercury, lead, and arsenic.

The move will lead to the contamination of waterways and drinking water sources—risking the health of people living near power plants, including Black and brown communities and low-income neighborhoods, where such polluting facilities are more likely to be sited. According to the agency’s own analysis, 1.1 million Americans live within three miles of a coal plant that discharges its toxic wastewater into a public waterway.

“The coal industry doesn’t need any more free passes,” says Jon Devine, director of federal water policy at NRDC. “Especially not when it dumps a toxic brew of pollutants that can cause neurological disorders and cardiovascular disease and increase the risk of cancer.”

The Clean Water Act requires the EPA to set limits on various industrial pollutants. Prior to their finalization in 2015, the limits for power plants hadn’t been updated since 1982—despite coal-fired power plants being the country’s largest source of toxic wastewater, dumping 250,000 pounds of pollution into our waterways every hour.

The Trump administration rollback, however, scales back requirements for the kinds of technologies power plants use to treat their wastewater, relaxes compliance deadlines, and exempts some facilities altogether.

“The final rule is based on bogus science, bad policy, and lousy economics. It counts on coal plants choosing to do the right thing voluntarily rather than under legal obligation,” says Devine, “It’s another handout to an archaic industry responsible for billions of pounds of pollution that contaminate our water, harm our health, and fuel climate change, year after year, and it will impose the costs of that pollution onto our communities.”

While the EPA claims the existing rules were financially burdensome for coal companies, affordable technologies exist that can limit the heavy metals and other toxins found in their wastewater. Many power plants, in fact, are already using them. And yet, this rule would let many polluting plants continue their business as usual without investing in system upgrades.

The Trump administration also finalized its new rule without proper public participation. The EPA didn't hold in-person hearings with the public—instead scheduling just one virtual hearing last December, six days before Christmas—and failed to engage with the communities that its weakened protections would most likely affect.

“Power plants are most often located within or near communities of color and low-income communities. This decision prioritizes polluters over those who will be hurt most, compounding existing environmental injustices,” Devine says.

‘Health Watch’ issued due to potential harmful algae at Deer Creek Reservoir

by: **Mercy Owusu**

Posted: Sep 2, 2020 / 09:09 PM MDT / Updated: Sep 2, 2020 / 09:09 PM MDT

<https://www.abc4.com/news/health-watch-issued-due-to-potential-harmful-algae-at-deer-creek-reservoir/>

DEER CREEK RESERVOIR, Utah (ABC4 News) – The Wasatch County Health Department has issued a “Health Watch” for Deer Creek Reservoir due to the presence of potentially harmful algae.

Samples were collected and health officials are awaiting test results.

Deer Creek however remains open. Those recreating in the area are advised to not swim, water ski, or boat in areas of scum.

Can Utah Lake be free of toxic algae in 2021?

A Utah company says yes

By Daedan Olander Aug 31, 2020, 5:03pm MDT

<https://www.deseret.com/utah/2020/8/31/21400042/utah-lake-clear-of-toxic-algae-2021-alpine-technical-services>

LINDON — In a season when blue-green algal growth is usually at its most problematic in Utah Lake, the Lindon Marina is cleaner than it's been in years — possibly decades — according to Richard Allred, the CEO of Alpine Technical Services.

Alpine Technical Services is a water solutions company and was one of the two firms hired earlier in the summer to take part in a pilot program to begin treatment of blue-green algal growth in the lake, with hopes of finding at least a temporary fix to the problem.

Cyanobacteria, also known as blue-green algae, grows naturally in water but becomes dangerous when in bloom.

It can be lethal to pets that swim in affected waters and causes a myriad symptoms in humans, including headaches, dizziness, rashes and gastrointestinal issues. The blooms can also precipitate more serious neurological problems.

The Lindon Marina is a popular recreation area in Utah Lake, but the summer months are some of the worst in terms of algal bloom.

“You’ve got to kind of think of it like a plant, so longer, hotter days is why you see them in the summer more often than other times,” said Jared Mendenhall, spokesman for the Utah Department of Environmental Quality. “That’s like prime growing season. So they get some fertilizer, and then they have a long, hot day, and that’s the same as your lawn in front of your house.”

In fact, on July 6, the same day Alpine Technical Services began its treatments on the marina, the Utah Division of Water Quality took a sample of Utah Lake that showed unsafe levels of toxins produced by blue-green algae, according to the DEQ.

From then to now, there has been a marked difference in the quality of the marina’s water, according to Allred.

“People text us pictures, like, ‘I’ve never seen the lake like this in my life — this clean. What are you doing? This is amazing,’” he said.

What are they doing?

For all the positive results they've seen, Allred said the process of cleaning the lake is "fairly simple."

Initially, the group treated the edges of the marina with an agricultural sprayer full of chemicals and then spread the rest of the solution in a zigzag pattern across the bay in a rowboat.

According to Allred, the solution disperses quickly and stays in the top meter and a half of the lake's surface, which is important so that it doesn't harm the helpful, necessary types of algae that grow at the bottom of the lake.

The treatment has been reapplied every two weeks since the beginning of the program, which will end as soon as the project's funds run out.

The Utah Lake Commission was the sponsor of the project's proposal and currently manages the initiative's contract. The commission thought it better to institute a budget limit rather than a time limit for the pilot.

"We didn't want to limit them and force them to stretch out the use of their product over the summer and not have that ability to adaptively manage to whatever the bloom scenario was," said Eric Ellis, the executive director of the Utah Lake Commission.

The solution itself is a mixture of copper sulfate. According to a news release, it is 99.99% biologically active so that pollution isn't a concern. It is also safe for humans and wildlife to ingest, according to the release.

"There have been lots of people over the years that have fear of using any products at all in lakes, but it is common and these products are used in drinking water systems as well," Allred said.

In future years, if the company is chosen to continue its work, fewer treatments will be needed to keep the algae down, according to Allred. He hopes the treatment can be used as a preventative tool, before the blooms spiral out of control, rather than a reactive measure.

"If you get ahead of the blooms, then you stop it with a minimal amount of chemistry," he said. "If you wait until they're in full bloom and do a reactive treatment, then, yeah, it is going to take more chemistry. So the goal would be to stay on top of it with low doses."

The company has been taking readings in the marina, which show the lake is cleaner than when they started, according to Allred, but there's also the eye test.

"A picture is worth a thousand words," he said. "I mean, you can see it."

A clean lake in 2021

"Algae has really hurt visitation in the past," said Ron Madson, Lindon Marina operator, in the press release. "Without ATS's treatments, our inner marina would not have been usable for recreational use all summer. The treatments made the water quality in our marina excellent

despite harmful algae bloom conditions right outside the marina. The application has been easy and remarkably effective.”

If blue-green algae were eliminated in the lakes of Utah, it would “absolutely” bring in quite a bit of financial revenue, according to Ellis, who said naming an exact dollar amount would be difficult.

However much it is, those extra funds could be available in the near future.

“It really is a reality — we could have a clean Utah Lake next year,” Allred said. “We’ll be presenting that: Here’s the process going forward and here’s the ease of the process going forward to treat the whole lake.”

The company will be presenting its results to the state of Utah during the third week of September. As part of the presentation, Allred will recommend continuing the treatments and expanding them to cover the entire lake as well as other bodies of water in Utah similarly plagued by algae.

“It should be our natural wonder, and it is kind of our natural disaster,” Allred said of Utah Lake. “Why wouldn’t we want clean water? Why wouldn’t we want a healthy lake? And why would we sit and watch a lake die?”

A complex equation

If only it were that simple.

Due to concerns about cost and the safety of the lake’s aquatic life, Ellis sees these treatments as viable short-term options that would eventually give way to a long-term solution.

“Anytime we undertake a project, an effort on that lake, it becomes so much more expensive than people might imagine,” he said. “And resources are incredibly limited on addressing those types of problems.”

He said for every thousand problems that the state encounters, only around 150 of those actually gain funding.

And despite the potential economic windfall that cleaning up the lake could present, it’s a much more convoluted matter than just money changing hands.

“It’s a difficult equation to bring dollars to the table on a project like Utah Lake when those that are bringing the dollars to the table aren’t necessarily the ones that would see that return,” Ellis said. “And so it is not the simple math equation that we would love for it to be.”

These questions of economic feasibility have stymied efforts in the past and frustrated people like Allred. However, the 2019 appropriation from the Utah Legislature that funded the pilot program was a “respectable sized” one, according to Ellis.

Additionally, the chemical solutions themselves aren't perfect, either, he said.

Copper, when used liberally over a long period of time, can build up at the bottom of bodies of water, which can negatively impact marine life, he said. If there is any chance of that occurring, he thinks the lake would better suited by finding a solution that treats the “problems rather than the symptoms.”

One of the primary problems is the excess of nutrients in the water that cause the blue-green algae to grow out of control.

Ellis said the problem is currently being addressed in two ways.

First is the removal of carp, which eat plants that grow at the bottom of the lake and act as a “filter” for nutrients in the water. The second involves replacing the invasive phragmites, a type of reed that grow around the lake's shoreline, with native plants that are better at absorbing nutrients.

According to Ellis, hundreds of thousands of dollars go toward removing the 8,300 acres of phragmites that grow on the lake's banks each year.

Additionally, the Utah Lake Water Quality Study started a couple years ago and is in the middle of a five-year effort meant to develop criteria for the ideal amounts of phosphorus and nitrogen that would allow aquatic life in the lake to thrive but keep the lake open for recreational activities.

But the study still has years to go and the removal of phragmites is a massive project. Long-term solutions take time to deliver, and in the meantime, it is nice to have a backup.

“There are some phenomenal technologies out there for short-term solutions,” Ellis said. “And those were what we wanted to land on, and so that we have a couple solutions in our back pocket for those years or that time of year where we could really target blooms that would, let's say, impact a big holiday weekend where we knew that lake usage would be high if the lake was clear and it would be destroyed if we had a big bloom.”

ABANDONED MINES THREATEN DRINKING WATER

BY CRISTINA TUSER SEP 03, 2020

<https://www.wwdmag.com/industrial-water/abandoned-mines-threaten-drinking-water>

Officials are trying to determine the threat to drinking water created by abandoned hard rock mining sites or features

Federal and state officials are attempting to identify hundreds of thousands of rock mining sites or features scattered throughout the West that pose a threat to drinking water.

The Gold King Mine spill in Colorado, for instance, released pollutants that contaminated waterways in three states and the Navajo Nation, according to AP News.

So far, hundreds of claims were filed against the U.S. Environmental Protection Agency (EPA). As a result, Utah settled its lawsuit just this month with the federal agency over Gold King Mine.

In the agreement, the EPA said it would initiate a preliminary Superfund assessment for three sites in Utah, which include two former mining districts in Big Cottonwood and Little Cottonwood canyons. These areas also happen to be home to hundreds of legacy mines, reported AP News.

According to AP News, mine debris and waste rock in those canyons have created problems for aquatic life due to contaminants like copper and cadmium. Zinc is also a threat to aquatic life in Little Cottonwood Canyon.

According to Erica Gaddis, director of the Utah Division of Water Quality, the standard for cold water fisheries is much stricter because animals exist in the water 24/7. The contaminants are not testing at levels of concern for drinking water standards, however.

“I am concerned this is a problem that has been ignored for too long,” said Salt Lake County Councilman Richard Snelgrove. “There are a lot of questions and solutions are long overdue. I am pleased that the EPA is looking at this as a potential Superfund cleanup site. It is obvious that not all is well in that canyon.”

The Bureau of Land Management estimates that based on current staffing and resources, it will take 500 years for the agency to complete an inventory of abandoned hard rock mines and features.

According to EPA estimates, based on current databases, there are more than a half million abandoned hard rock mining sites on BLM, National Park Service and Forest Service lands.

Water boil order remains in place for Scofield in Carbon County

By Gephardt Daily Staff September 3, 2020

<https://gephardtaily.com/local/water-boil-order-remains-in-place-for-scofield-in-carbon-county/>

SCOFIELD, Utah, Sept. 3, 2020 (Gephardt Daily) — A water boil order remains in place for the town of Scofield in Carbon County after the drinking water supply tested positive for coliform.

The Rural Water Association of Utah issued the order Sunday, instructing residents to boil their water for the next 72 hours.

On Thursday evening, Utah Department of Environmental Quality posted on Facebook: “The boil order in the town of Scofield continues. Testing in the water Wednesday came back negative for coliform and E.coli. Officials, however, must show repeat negatives in order to lift the boil order.

“The test results from Thursday should be in sometime Friday. At that point, officials hope the boil order will be lifted then.”

The water association, along with the Utah DEQ, attempted to resolve the issue by flushing and chlorinating the pipe, officials said.

The Centers for Disease Control and Prevention website says coliform bacteria are present in the environment and feces of all warm-blooded animals and humans. Coliform bacteria are unlikely to cause illness. However, their presence in drinking water indicates that disease-causing organisms, or pathogens, could be in the water system.

A total of 90 residential connections and two commercial connections have been affected, officials said.

The CDC says that during a boil order, you should:

Use bottled or boiled water for drinking and to prepare and cook food.

If bottled water is not available, bring water to a full rolling boil for one minute (at elevations above 6,500 feet, boil for three minutes), then allow it to cool before use.

Boil tap water even if it is filtered.

Do not use water from any appliance connected to your water line, such as ice and water from a refrigerator

EPA Sued Over Not Regulating Perchlorate in Drinking Water (1)

Sept. 3, 2020, 2:46 PM; Updated: Sept. 4, 2020, 1:33 PM

Amena H. Saiyid

Reporter

<https://news.bloomberglaw.com/environment-and-energy/epa-sued-over-failure-to-regulate-perchlorate-in-drinking-water>

The Natural Resources Defense Council sued the EPA in the D.C. Circuit Thursday for failing to set drinking water standards for perchlorate, a rocket fuel chemical.

The advocacy group petitioned the U.S. Court of Appeals for the District of Columbia Circuit to review the Environmental Protection Agency's decision (RIN: 2040-AF28) on perchlorate, announced in June and published in July.

The agency concluded after analyzing evidence that perchlorate doesn't appear in enough public water systems, or at high enough levels, to cause concern. The decision came as it acknowledged that perchlorate can affect human health by interfering with the thyroid gland.

The chemical can be found in rocket fuel, fireworks, and fertilizers, and can cause developmental impairments in fetuses, according to the Government Accountability Office.

Long-term exposure to perchlorate can cause thyroid problems. Short-term exposure may cause eye and skin irritation, as well as nausea and vomiting, according to an EPA fact sheet.

"The EPA should protect communities' health, not risk it," Erik Olson, the group's senior strategic director for health, said in a statement.

Causes of Action: Safe Drinking Water Act.

Relief: Direct EPA to reverse its decision to set perchlorate standards.

Response: The EPA said it doesn't comment on pending litigation.

Attorneys: Natural Resources Defense Council is representing itself.

The case is Nat. Res. Def. Council v. EPA, D.C. Cir., No. 20-1335, petition for review filed 9/3/20.

(Updates Sept. 3 story with docket information and EPA comment.)

UPDATE: Pleasant Grove City lifts boil order after 5 days

by: **Tracy Smith**

Posted: Sep 7, 2020 / 04:58 AM MDT / Updated: Sep 10, 2020 / 10:00 AM MDT

THURSDAY 9/10/2020 9:41 a.m.

<https://www.abc4.com/news/top-stories/water-boil-order-issued-by-pleasant-grove-e-coli-discovered/>

After five days of not having drinking water, Pleasant Grove City has lifted the boil order that was originally issued on Sept. 5. The boil order lift is effective immediately.

After extensive cleaning and flushing of the areas of concern around 300 North and 300 East, the city collected follow-up water samples. All samples were absent of coliform and E. coli. All testing showed that the original contamination came from nine homes.

The city says that if you are located in the Monson Service Area between 200 North to 500 North and 200 East to 400 East, it is recommended that you run each tap or faucet for a minimum of 5 minutes and that you dispose of all ice formed since the boil order has been in place.

PLEASANT GROVE, Utah, (ABC4 News) – UPDATE 4:45 PM Pleasant Grove City has updated the information surrounding the Water Boil order once again.

In a series of Tweets, the city has stated the following:

“Pleasant Grove City is continuing to work with the Department of Environmental quality (DEQ) regarding their protocols to lift the Boil Advisory.”

“We have received some additional test results this afternoon that confirm our initial determination that this is an isolated incident affecting nine service connections on 300 North between 300 East and 400 East.”

“The next round of test results will not be available until Monday before noon. We will coordinate with the DEQ at that point and determine whether or not the boil order can be lifted for the larger service area.”

“Right now, the State protocols require the Boil Advisory to remain in effect as originally posted. The City is working around the clock to do everything it can to get the Boil Advisory lifted as quickly as possible. As new information becomes available, we will update the status.”

“Thank you to the residents who have been so cooperative and supportive as we work through this issue.”

UPDATE 12:45 am: Pleasant Grove City released information via tweet, they have received preliminary tests taken yesterday, and all tests have come back negative. However, The boil notice advisory remains in effect until lifted. The city says things are moving forward in a positive direction.

Pleasant Grove has issued a boil order for water in parts of the City. Do not drink the water without boiling it first. E. Coli bacteria have been discovered.

Three test samples from Pleasant Grove located between 300 East and 400 East have tested positive for E. Coli bacteria. The City has issued a Boil Order Advisory to all customers within the Monson service area.

Water, a Utah constitutional amendment and how it affects your home

November ballot question deals with ‘temporary’ water

By [Amy Joi O'Donoghue@Amyjoi16](#) Sep 7, 2020, 4:00pm MDT

<https://www.deseret.com/utah/2020/9/7/21403038/water-a-utah-constitutional-amendment-and-how-it-affects-your-home>

SALT LAKE CITY — A constitutional amendment on November’s ballot may appear to be a sleeper issue, but proponents pushing its passage say a no vote could put millions — possibly billions — in property value at risk in Salt Lake County and across the state.

Does that have your attention?

In Utah, the second most arid state in the nation, it all boils down to water: Who has it as a permanent source attached to the property they own, or who has a home or business that unknowingly is receiving water through a contract subject to cancellation within as little as 30 days notice.

“I see this as a political nightmare. People don’t really care about politics, but when it comes to the value of someone’s home, people get really grumpy. It’s like kicking a beehive,” said David Fife, a real estate appraiser.

Fife, along with Salt Lake County’s chief deputy assessor Chris Stavros, are among those trying to raise awareness about the importance of approving the constitutional amendment this fall, known as Amendment D, that will rectify a potential problem affecting about 150,000 residents in Salt Lake County and hundreds more in an estimated 50 communities scattered across the state.

Multiple cities provide water to users outside their service boundaries under contracts that be canceled with little notice and for no reason.

This “surplus” water has been a tool used in development, but also could be brandished as leverage due to the tenuous nature of the contract.

“Imagine your home, your block or your city given a 30 day notice to go find water,” said Rep. Kim Coleman, R-West Jordan.

Coleman, Fife and Stavros were discussing the issue at a recent meeting of the Association of Community Councils Together, which is trying to stoke attention over the importance in changing the Utah Constitution.

HB31, sponsored by Coleman and passed in the 2019 Legislature, requires cities to create a designated water service area and for residents who live outside their boundaries, notice that the water supply cannot be terminated. It also gives those residents a voice in the adjustment of water rates, which proponents of the change said is critical as well.

But the new law is toothless without passage of the constitutional amendment.

“It is not a problem right now, but failure to pass this constitutional amendment and solve this problem will ultimately damage so many local governments and have huge implications for so many property owners throughout the state of Utah, not just in Salt Lake County,” Stavros said.

“Frankly it’s quite scary.”

Stavros, in fact, reached out to his boss — Salt Lake County Assessor Kevin Jacobs — to spread the word to other assessors throughout the state that might bump up against potential problems in their communities when it comes to surplus water contracts.

“From the assessor’s point of view and as chief deputy assessor and a public servant myself, I am very concerned about this issue as it potentially affects residents in an adverse way,” Stavros said.

He emphasized it is critical assessor offices have the right information on property valuations and are aware of the risks to those valuations posed by surface water contracts.

During legislative testimony on the constitutional amendment and on Coleman’s bill, an attorney for Salt Lake City steeped in water law knowledge said he did not believe any of the surplus water contracts had been terminated with that 30-day notice, but he also said there was nothing to legally preclude it from happening.

Nancy Carlson-Gotts, president of the Association of Community Councils, said she is one of the residents of Salt Lake County who receives her water through a surplus contract.

“I was one of those people who had no idea,” she said. “You buy a home, turn on the faucet and the water is there ... I don’t know how many people in Millcreek know they are on surplus water and what it potentially means to them.”

Carlson-Gotts said she doesn’t believe there is any opposition to passage of the amendment — it is just a matter of getting the word out. Her association will be distributing information on the amendment in its next newsletter.

Coleman added that it is a complex issue she hopes people take the time to understand.

“It’s rather a sleepy policy. Unless this is affecting you, most voters won’t know what they are voting for.”

How We Got Conned Into Drinking Bottled Water — And How We Can Stop

In just a few decades, water went from a common resource to an incredibly popular packaged commodity with a serious environmental footprint.

By Stephen Robert Miller

09/11/2020 05:45 am ET **Updated** 1 day ago

https://www.huffpost.com/entry/conned-drinking-bottled-water-how-we-stop_n_5f578dc3c5b6946f3eb72489

Millions of years ago, dinosaurs died and were covered with mud. Over a period of time we won't pretend to wrap our heads around, organic matter that had once roamed and swayed above ground reduced like béchamel, some into a carbon-rich gravy, some into gas. Then, one day very late in our story, a petrochemical company sucked the stuff from deep beneath our feet and brought it into the light.

This was refined into ethane and naphtha, which were further refined and transmogrified into plastic, molded to the shape of a bottle, filled with water from a city tap, labeled, shipped across the country, refrigerated, purchased, humped miles into a National Park in Colorado and abandoned by the side of a hiking trail.

That's where I stumbled upon it. Forgotten, crumpled in the dust with beads of water clinging inside its hazy walls — an unceremonious end for something that had traveled so far, but not an uncommon one.

Around the world, a million bottles of water are sold every minute, and although they're almost entirely recyclable, most get tossed into landfills, clog up rivers, and sink to the bottom of the sea, taking anywhere from 500 to 1,000 years to degrade. In the U.S., more than 70% become waste.

In just a few decades, water went from a common resource many of us, especially those in the developed world, could access with minimal impact, to an incredibly popular packaged commodity with a serious environmental footprint.

Companies have had enormous commercial success selling us on the idea that water is better bottled. They have marketed their products as healthy, energy-boosting, ultra-hydrating, youth-enhancing and pure. Today, a true connoisseur can buy a \$90 bottle of water extracted from melted Norwegian icebergs, while the average consumer thinks nothing of dropping a buck-fifty on 16 ounces of a liquid that tumbles — healthfully, hydratingly — from the faucet at home.

“Companies like Nestlé and Coke are taking the public’s water, putting it in a plastic bottle and marketing it,” said Judith Enck, founder of Beyond Plastics and a former EPA regional administrator under President Barack Obama.

In some ways, their success is the ultimate expression of modern capitalism. At the root of multiple, enormous environmental crises is an industry that has risen to a market value of \$160 billion in 2019 by convincing the world to buy something most of us can get virtually for free.

How We Got Sold On Something We Didn’t Need

Bottled water dates back as far as 17th century England, where artisanal well water was rumored to possess therapeutic minerals and was often sold in pharmacies.

The first American brand, Poland Spring, emerged in 1845 after an innkeeper in Maine claimed to have been saved from death upon drinking from a nearby spring.

The idea that spring-fed bottled water could cure what ailed you made sense at a time when diseases like cholera and dysentery lingered in public drinking supplies. But popularity for the bottled beverages began to flag when cities started disinfecting tap water with chlorine in the early 20th century.

In the 1970s, as consumer trust in public water caused sales to drop, bottlers like Evian and Perrier embarked on incredibly successful PR campaigns aimed at lingering anxieties about tap water to sell American consumers something they already had plenty of.

“It wasn’t hard to convince the public that bottled water was safer than tap,” said Elizabeth Royte, author of ”Bottlemania: Big Business, Local Springs, and the Battle over America’s Drinking Water.” “All it takes is publicizing a few cases of waterborne illness to strike fear in a public that neither knows where its tap water comes from nor how it is treated for drinking.”

Through sleek television ads and images of skinny blondes sucking youth and vigor from a slender bottle, companies targeted a younger generation that was hooked on aerobics and healthy living.

Around the same time, a historic change in how the product was delivered made it much more convenient. Up until the 1970s, water was being sold in glass bottles or aluminum cans. In 1973, the chemical company DuPont transformed history with a plastic bottle rigid enough to hold water and capable of containing the pressure of carbonation. Polyethylene terephthalate, or PET, was durable and lightweight, and, by replacing heavier containers, opened the floodgates to our current plastic waste disaster.

Selling water became even more commercially viable when, by the 1990s, big-time American players like Coca-Cola and PepsiCo realized the water inside the bottles didn’t have to come from a gurgling natural spring; it could be taken right from the city tap, then filtered, slapped with a label and sold at 30 times the cost at the faucet.

Of course, for some communities, bottled water offers a literal lifeline. In many places around the world where sanitation or delivery infrastructure are lacking or nonexistent, bottled water is the best, or only, option. It has also proven vital in the wake of disasters like 2005's Hurricane Katrina.

And while the U.S. has some of the safest tap water in the world, public systems are imperfect. This was made very clear by the crisis in Flint, Michigan, where a switch in the city's water supply in 2014, made to save money, ended up piping tainted water into people's homes. Even six years after the scandal, distrustful of the water flowing from their taps — and the pandemic stalling the city's work to finish replacing its water pipes — some residents continue to rely largely on millions of donated bottles of water to get by.

But the industry hasn't become an economic behemoth by providing an essential service in times of crisis. It has captured customers with big claims and bold branding.

And we continue to lap it up.

Bottled water overtook soda as the largest beverage category in the U.S. in 2016. Americans bought 14.4 billion gallons of bottled water in 2019 and global sales are only expected to grow, predicted to reach \$307.6 billion by 2025.

An Environmental Tragedy

The costs associated with our addiction are astounding, but not always obvious. At a time when the world desperately needs to stop extracting and burning fossil fuels to avoid the compounded impacts of climate change, voracious production of plastic bottles is propping up the fossil fuel industry.

“As the world shifts more toward renewables and cleaner transportation, the demand for fossil fuel in those sectors is reducing,” Enck said. “So, the fossil fuel industry is banking on plastic production to be their new growth sector.”

Ethane cracker factories — which produce the building blocks for the plastics industry — are being planned across the eastern U.S., including a \$6 billion plant Shell is constructing just outside Pittsburgh. These petrochemical plants, often built in or near neighborhoods of color, pollute the air, damage health and exacerbate structural inequalities.

Flying these plastic bottles around the world also creates emissions. Fiji Water, for instance, is bottled at the source on a volcanic island nearly 3,000 miles off the eastern coast of Australia and then transported 5,522 miles to the company's headquarters in Los Angeles as well as 60 other countries — only to be shipped again to stores and to warehouses which distribute them further.

Water collected closer to home presents its own set of problems. Although nearly two-thirds of America's bottled water comes from municipal taps, some companies are sucking up groundwater aquifers in parts of the country where water scarcity is a serious concern. In

drought-plagued California, bottlers including Nestlé have been accused of depleting local reserves.

“We are in full compliance with state and federal regulations regarding our operations in the San Bernardino National Forest,” Nestle told HuffPost in an emailed statement. “We never collect more water than is naturally available, which means, if the environment yields less, we collect less.”

In Washington state, residents concerned about Crystal Geysers’ use of local aquifers managed to press lawmakers into drafting a bill that would ban bottlers from extracting groundwater statewide.

“Pumping water out of the ground, putting it in plastic bottles and exporting it out of the state of Washington is not in the public interest,” Craig Jasmer, leader of the Lewis County Water Alliance, told Pew Charitable Trusts in February. The bill ultimately died in committee.

Exploitation of fresh water supplies is of even greater concern in developing parts of the world. In Indonesia, 28 million people lack access to safe water, but western companies still arrive to extract water from rock-filtered aquifers. Danone, the massive French bottling company that controls more than half of the local bottled water market, pulls over one billion gallons of water a year from local springs, and sells much of it right back to Indonesians.

But perhaps the most visible impact of the stratospheric rise of the bottled water industry is the plastic pollution it leaves in its wake. The bottle I found high above the plains and far from any major body of water had been alone, yet throughout the world plastic waste often aggregates into piles, swells and gyrating offshore patches. We notice it most in the oceans, into which more than 8 million tons of plastics leak each year.

In many developing countries where the bottled water industry is growing fast, plastic waste management is often tenuous. In Indonesia alone, more than 3 million tons of plastic waste becomes litter each year. Recent studies estimate that Asian coastal nations account for more than 80% of the total leakage of plastic into the ocean.

Of course, poor plastic waste management is not just a developing nation issue. In the U.S., the plastics recycling rate has actually decreased recently, from a paltry 9.0% in 2015 to 8.4% in 2017.

Part of the problem is the incredibly low cost of virgin oil stocks, said Ramani Narayan, a materials engineer at Michigan State University’s Biotechnology Institute. “As long as virgin PET can be made cheaper and there is no regulatory driver for change, it will be difficult for recycled PET to make any inroads in the marketplace.”

The Quest To Do Better

With impacts mounting so too is the pressure for companies at the root of the problem to do better. A rising generation of plastic-conscious consumers has pushed to ban plastic straws and bags in hundreds of U.S. cities, and calls to ban plastic bottles have been raised from Los Angeles to Cape Cod. Reusable bottles are slowly gaining steam, and high-tech, hands-free fountains operated by private companies are popping up in public spaces across the country.

Some companies are responding by developing ingenious alternatives to fossil fuel-based plastic.

You may have seen the green-capped bottle from Dasani (the water brand owned by Coca-Cola), up to 30% of which is made from living material, like plants (not dinosaurs). Coca-Cola is also supporting the Dutch biochemical company Avantium, which announced this year that it is working on a plant-based plastic that uses no fossil fuels and could decompose within a year.

Plant-based plastics, or bioplastics, are made at least in part from ingredients derived from plants like corn, potatoes, rice, soy, sugarcane, wheat and vegetable oil. Like PET bottles, they can be broken down and recycled into new material. Some are compostable, and many are marketed as biodegradable — giving consumers the impression that these bottles are quickly and harmlessly reabsorbed into the environment.

But we should beware of some of these claims, said Nayaran, “The word ‘biodegrade’ has been used and misused. Everything is biodegradable, given the time and the right environment.” In truth, a bottle labeled biodegradable will likely require years in a particular environment to break down.

Compostable bottles, meanwhile, have to be processed in industrial composters, which are not always available. In Denver, near where I live, the recycling service will not take plastics labelled “compostable” and the city’s composting service will not accept plastics of any kind due to the costs of sorting and processing.

So, regardless of the good vibes you might feel reaching for a beverage with a plant-based label, chances are that bottle is still headed for a landfill, where it will stick around for a long time (unless it blows into the ocean, of course).

The real value of a plant-based water bottle isn’t in what happens after the thing has been used, but in how it was made. More than 90% of all plastics are derived from virgin fossil feedstocks, according to the Ellen MacArthur Foundation. This represents 6% of global oil consumption, or about the amount of oil consumed by the global aviation industry. Building plastic bottles out of renewable crops may at least keep some of that oil in the ground. In 2019, the production and incineration of plastic contributed an estimated 850 million metric tons of greenhouse gases, according to the Center for International Environmental Law.

Other companies are turning to more traditional materials in a bid to swerve plastic. Boxed Water, which sells water in recyclable cartons, is one of them. “Up until about two years ago, half our work was just explaining to people why recycling wasn’t enough,” said Robert Koenen,

the Michigan-based company's chief marketing officer. "I like to think the general public has gotten to the point where they're realizing that plastic is bad."

Thanks to a new plastic cap made from tree pulp, and cardboard from sustainably managed Norwegian forests, Boxed Water claims a 92% plant-based box. (The other 8% is made up of thin plastic and aluminum liners used to maintain shelf life.)

The company commissioned a study comparing the lifecycle impacts of its product to plastic bottles and aluminum cans. Making a carton of water costs about five times as much as a basic plastic bottle, but has a carbon footprint 64% lower than plastic, the study found. Boxed Water notes that its cartons are fully recyclable, but only for the 72% of Americans who live near a recycling plant that can handle them.

Other companies are going full circle back to pre-1973 and selling water in aluminum cans. Open Water, for instance, touts the supreme recyclability of its product. At roughly 50%, the recycling rate of aluminum beverage cans is nearly twice that of plastic bottles. Aluminum production, however, requires mining and refining bauxite, a clay-like rock from which aluminum is derived — it's an energy-intensive process that has been linked to acid rain.

Whatever alternative materials are used and developed, so long as overall production continues to ramp up, we're still going to see emissions-intensive production and bottles, cans and cartons piling up in landfills and leaching into oceans.

While reusable alternatives exist, their use lags far behind that of their disposable counterparts. Sales of reusable bottles have increased globally, but still come in at about 4.5% of the disposable market. Meanwhile, as investment in public infrastructure wanes and publicly maintained drinking fountains disappear, people are left with fewer options.

Private companies like Elkay, which claims its hands-free bottle filling stations have avoided the use of 24 billion plastic bottles, are stepping into that void, but they offer little more than a Band-Aid on a gargantuan problem as long as bottling companies' responsibility for their product ends at the point of sale.

"If we're relying on voluntary efforts by the brands, the problem will get worse and worse every year," Enck said. With time running out to address the issue, we need laws with teeth and we need them enforced, she said.

The Break Free From Plastic Pollution Act, which was introduced into Congress in February by Rep. Alan Lowenthal (D-Calif.), is one piece of ambitious legislation aimed at the plastic problem's worst offenders. If passed, it would phase out single-use products, establish a nationwide refund for returning beverage bottles, and make producers chip in to cover the costs of properly managing waste to shift financial burden from cities and states.

Sweeping? Yes. Doable? Enck won't get her hopes up until after the November election.

For those who don't have access to clean, safe drinking water — from Flint to Indonesia — stemming the flow of bottled waste will require more than plastic bans and educational campaigns. It will require overhauling water distribution infrastructure, building latrines and funding taps in homes to offer clean, safe and free drinking water to some of the poorest communities.

Where Do We Go From Here?

The discarded bottle wasn't the only bit of waste I found in the Rockies that day. There were granola bar wrappers, dog poop bags and even a pink polyester headband dangling in a bush. But the plastic water bottle stuck with me — it was at once something so vital, sacred and superfluous.

We've been sold on the convenience of a product we didn't need, and now we're collectively paying the costs of its unintended consequences, cleaning up its spills and patches.

“Bottled water is symbolic of much larger issues, and quitting it should be a no-brainer for the vast majority of Americans,” Royte said. “But if we can't acknowledge how this one tiny thing — for which there are viable and affordable alternatives — wastes resources, harms the environment both upstream and down, and prioritizes hyper-individualized solutions to collective problems, it doesn't bode well for us.”

So, what's a person to do?

Advocate, lobby, vote with your dollars, collect trash at the beach if it makes you feel better. I plucked the bottle from the dirt, placed it in my pack, humped it out of the woods and tossed it into the first recycling container I came across. Who knows where it will go from there.

New York Adopts Drinking Water Standards For Three Toxic Chemicals

Gina-Marie Cheeseman

Sep 14, 2020

<https://earthmaven.io/planetwatch/news-opinion/new-york-adopts-drinking-water-standards-for-three-toxic-chemicals-OTKzvjyBNkG9rR-IWAnQcA>

New York State leads the charge for rigorous drinking water standards for toxic chemicals like 1,4-dioxane, PFOS, and PFOA

The state of New York adopted drinking water standards this year for three toxic chemicals. New York adopted a drinking water standard for 1,4-Dioxane, setting the maximum contaminant level of 1 part per billion for 1,4-Dioxane. The standard is the first of its kind in the U.S. New York also adopted maximum contaminant levels for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) in the state's drinking water at 10 parts per trillion. It is among the lowest levels in the U.S. for both contaminants. Under the new regulations, New York requires testing and monitoring for public water systems.

"While the federal government continues to leave emerging contaminants like 1,4-Dioxane, PFOA and PFOS unregulated, New York is leading the way by setting new national standards that help ensure drinking water quality and safeguard New Yorker's health from these chemicals," Governor Andrew Cuomo in a [statement](#). "The environmental movement was founded in this great state and we will continue to move forward to protect our most precious resources for generations to come."

The health dangers of 1,4-dioxane, PFOS, and PFOA

1,4-dioxane is in products that create suds such as shampoo, liquid soap, and bubble bath. It penetrates the skin and is considered a probable human carcinogen by the U.S. Environmental Protection Agency. The National Toxicology Program lists it as an animal carcinogen, and California's Proposition 65 list of chemicals known or suspected to cause cancer or birth defects included it. It is not listed on ingredient labels because 1,4-dioxane is created when common ingredients such as sodium laureth sulfate, PEG compounds, xynol, cetareth, and oleth react when mixed.

[EWG](#) estimates that 1,4-dioxane is in about 22 percent of the more than 25,000 cosmetic products listed in its database. Because the U.S. Food and Drug Administration does not require the listing of 1,4-dioxane on product labels means there is no way to know if a product contains, which makes it difficult for consumers to avoid it. One way to avoid 1,4-dioxane in cosmetic

products is to be products certified by the U.S. Department of Agriculture National Organic Program. A study by the Organic Consumers Association found that it does not exist in cosmetic products certified by the USDA National Organic Program. An analysis by EWG found that water supplies for over seven million people in 27 states have 1,4-dioxane contamination.

PFOS and PFOA are part of a group of chemicals called polyfluoroalkyl substances (PFASs). They are used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. PFOS and PFOA do not break down in the environment, can move through soils, contaminate drinking water sources, and build up in fish and wildlife. They are found in soil, air, and groundwater across the U.S. Tests commissioned by EWG found PFAS in drinking water in dozens of U.S. cities. Researchers tested water samples from 44 areas in 31 states and the District of Columbia. Only one sample had no detectable PFAS, while two other locations had PFAS below the level that independent studies show are a risk to people.

Centers for Disease Control and Prevention researchers measured at least 12 PFAS in the blood serum of participants 12 years and older. What they found are four PFAS, including PFOS and PFOA, in the serum of almost all of the people tested. That is a problem because research suggests that high levels of PFAS may cause increased cholesterol levels, changes in liver enzymes, and increased risk of kidney or testicular cancer.

Faster, on-site way to detect PFAS

New method could aid in the removal of the toxic, persistent environmental contaminants

Date: September 15, 2020

Source: Curtin University

Summary:

Scientists have developed a new and easier on-site method to immediately and accurately detect and measure levels of PFAS, which are persistent environmental pollutants sometimes found in contaminated lands and waters around the industrialized world.

<https://www.sciencedaily.com/releases/2020/09/200915090125.htm>

Curtin University research has developed a new and easier on-site method to immediately and accurately detect and measure levels of PFAS, which are persistent environmental pollutants sometimes found in contaminated lands and waters around the industrialised world.

Professor Damien Arrigan, from the School of Molecular and Life Sciences at Curtin University, explained PFAS (per- and polyfluorinated alkyl substances) are potentially harmful chemical materials that were used for a long time in various commercial and industrial applications, including in firefighting foams, some non-stick cookware, stain and water resistant coatings on carpet and clothing, and various paper and packaging products.

"As a result of their widespread use, many groundwater and soil sites around the world are contaminated with these materials, which are often referred to as 'forever chemicals,' because they don't breakdown or degrade in the natural environment," Professor Arrigan said.

"The only way to prevent them entering the food chain, is to minimise or remove the chemicals from the environment -- making early detection a highly desirable part of this removal process."

Typically speaking, to find out if a site or body of water is contaminated with PFAS materials, soil or water samples must be taken from a site and then taken to a laboratory for chemical analysis, a process which may take several days.

The Curtin research, in collaboration with Universidad Nacional de Córdoba, Argentina, sought to improve this process by using on-site chemical sensors which allow an instant contamination test that immediately indicates which water samples should be collected and sent to a lab for a more detailed chemical analysis.

"The chemical sensors we developed use electrodes to push ionised PFAS across an oil-water interface, or 'boundary,' using special glass membranes with microholes. This process changes

the electrical properties of the interface and gives us an electrical current that tells us about the concentration of substances," Professor Arrigan said.

"This method allows us to not only detect the presence of perfluorooctane sulfonate, one of the most widely used PFAS, but also measure it at very low concentration levels -- lower than the concentration values set for safe limits of this substance in drinking water.

"Our preliminary results show that with our new method, it is possible to immediately detect very small concentrations of PFAS substances in waters, without the need to send the samples offsite for initial analysis.

"With appropriate development into a more portable, robust technology, this method could potentially be used by industry and government agencies, and the general public, to monitor PFAS concentration in water and soils and get results within minutes, rather than days."

The full research paper, Detection of perfluorooctane sulfonate by ion-transfer stripping voltammetry at an array of microinterfaces between two immiscible electrolyte solutions, was published in the journal *Analyst* and can be found online [here](#).

Thirsting for Solutions to America's Water Crisis

Aging infrastructure, legacy pollution, and emerging contaminants bring an urgent focus to the quality of the water we drink

By Lynne Peeples for Ensia

September 15, 2020

<https://www.consumerreports.org/water-quality/thirsting-for-solutions-to-americas-water-crisis/>

Once a week, Florencia Ramos makes a special trip to the R-N Market in Lindsay, Calif. “If you don’t have clean water, you have to go get some,” says Ramos, a farmworker and mother of four who lives in the neighboring Central Valley town of El Rancho.

She has been purchasing jugs of water at the small store for more than a decade. At first, she was concerned that the county well water that flowed through her tap contained high levels of nitrate, a pervasive health hazard across rural U.S., where nitrogen-rich fertilizer and livestock manure seeped into groundwater. While it never tasted bad, she recalls her water service provider instructing her not to drink it.

Things didn’t get any better in 2016, when El Rancho plugged into the city of Lindsay’s water system. That water was—and still is—polluted with potentially harmful disinfection byproducts, which form when chlorine used to kill dangerous organisms in drinking water reacts with manure and other organic matter.

“We’ve always known our water was contaminated,” says Ramos, through a translator. Ramos is a member of the Agua Coalition, a grassroots group that advocates for safe, clean, and affordable water.

Over the years, she watched as people in her community fell ill. One woman died of cancer; another succumbed to kidney disease. Ramos can’t be sure dirty water was to blame, but she is suspicious and continues to buy bottled water for drinking and cooking.

And it is not cheap. Buying water at the market costs her some \$30 per month on top of her approximately \$130-per-month tap water bill—not to mention the time lost in making the weekly trips. The financial challenge became even greater last November, when she was laid off from her agricultural work. Her employer told her that she would be back to work by March or April, but when the time came, she was told not to return because of the COVID-19 pandemic.

Across the U.S., drinking-water systems serving millions of people fail to meet state and federal safety standards. Millions more Americans may be drinking unsafe water without anyone

knowing because limits set by the Environmental Protection Agency are too high, the contaminants the water contains are unregulated, or their drinking-water source is too small to fit under EPA regulations. (An estimated 20 percent of private wells, which fall outside EPA regulation, have contaminants that exceed EPA standards.)

The nitrate and disinfection byproducts that worry Ramos represent a fraction of the many chemical and biological pollutants that find their way into drinking-water systems through agricultural runoff, discharges from industry, aging pipes, and all the stuff that comes from our toilets, sinks, showers, and washing machines. From coast to coast, people are starting to recognize the pervasiveness of potential problems and rally around efforts to make drinking water safe for all.

“By and large, water quality in the U.S. is some of the best in the world,” says Maura Allaire, a water economist at the University of California, Irvine. Modern management and treatment technologies provide clean water for most Americans. Yet in a given year, between 7 and 8 percent of community water utilities report at least one health-based violation of federal standards, according to her research.

“How can we help those falling through cracks?” Allaire asks.

Long List of Threats

In 2015, Flint, Mich., made headlines when a change in its water supply exposed thousands of children to high levels of lead, a neurotoxic metal. The tragedy led other communities around the country to take a closer look at their own drinking-water quality. Many places, such as Newark, N.J., have since discovered dangerously high lead levels, too.

Meanwhile, per- and polyfluoroalkyl substances, or PFAS—difficult-to-destroy chemicals widely used in nonstick pans, stain-resistant carpets, and firefighting foam—have infiltrated major water supplies and grabbed headlines across the country as potential carcinogens and endocrine disruptors.

The Centers for Disease Control and Prevention recently issued a statement warning that exposure to high levels of PFAS might also suppress the immune system and raise the risk of infection with COVID-19. The CDC further referenced evidence from human and animal studies suggesting that PFAS could reduce response to vaccines—on top of posing a number of other health threats.

Plastics, pesticides, and pathogens also fall on the long list of threats to safe drinking water.

Between 10 and 15 percent of Americans are on private wells or tiny water systems that serve fewer than 15 residences. The rest of the country relies on community water systems—upwards of an astounding 50,000 in total.

Infernos, Infections, and Chemical Cocktails

The first water pipes under America's streets were not necessarily laid for the purpose of drinking, eating, or bathing.

Beginning in Boston in the mid-1600s, cities constructed water systems primarily for fire protection. "Urban infernos were a real concern," says Greg Kail, director of communications for the American Water Works Association (AWWA), the largest trade group for water supply professionals.

Most systems were ultimately adapted to supply water to commercial and residential properties. And in the early 20th century, the practice of filtering and disinfecting water began. Untreated water supplies had been sickening people with pathogens such as typhoid and cholera.

"One of the miracles of the 20th century is that drinking-water treatment decreased mortality, including from a host of afflictions people didn't even realize were related to water," says David Sedlak, an environmental engineer at the University of California, Berkeley.

But disinfection had a downside, too. In the 1970s, researchers discovered that a commonly used disinfectant, chlorine, could produce harmful byproducts under some circumstances. Chronic exposures to these byproducts have been linked in animal and epidemiological studies with liver, kidney, and nervous system problems, as well as a potential increased risk of cancer. "But it's important that we don't stop using disinfectants because of fears of disinfection byproducts," says John Fawell, an independent drinking-water consultant based in Slough, England. "The pathogens that can be in the water are still very able to cause significant problems."

In the 1970s it also became clear that water was being polluted with contaminants that disinfectants were helpless against. Scientists were increasingly recognizing the threat of toxic chemicals from industrial sources, many of which posed risks over long periods of time, as opposed to the acute effects of a waterborne illness.

Congress enacted the Toxic Substances Control Act (TSCA) and the Resource Conservation and Recovery Act in 1976, and in 1980 established the Superfund program, which focuses on cleaning up hazardous waste sites and so helps prevent drinking-water supplies from becoming contaminated in the first place.

The key piece of legislation protecting our drinking water, however, is the Safe Drinking Water Act. In 1974 Congress passed the act, through which the EPA now sets minimum health-based standards on more than 90 drinking-water contaminants, including lead, nitrate, arsenic, disinfection byproducts, pesticides, solvents, and microbial contaminants. It is primarily up to each state to implement and enforce those standards—or set and enforce their own more stringent standards.

"Great progress was made," Sedlak says. "But I think the more we study water supplies and the more stress that's put on existing water supplies, the more problems we discover." The EPA lists

some 86,000 chemicals in its TSCA Chemical Substance Inventory—a number of which could find their way into our water in some way or another.

Seth Siegel, author of “Troubled Water: What’s Wrong With What We Drink,” underscores the evolution over time in contamination concerns, from the biological to the chemical. “A dab of chlorine might address microorganisms, but it does nothing about these synthetics,” he says. “We are ingesting, in micro quantities, a cocktail of chemicals all the time.”

Beyond Flint

Allaire lived in Lansing, Mich., when the water crisis broke in Flint, about an hour northeast. Flint had just switched its water source from the Detroit Water and Sewerage Department to the Flint River. The river water was slightly more acidic—and therefore more corrosive—than Detroit’s water. Local water officials didn’t use common corrosion control methods. As a result, lead and other pollutants began to leach from the pipes that distribute water to the city’s residents.

“We weren’t far away, and we were in a similar situation: a former industrialized city that had a massive exodus of its population,” she says. The tragedy led her to wonder just how far water quality issues extended beyond Flint. “Were there mini-Flints around the country, or was this a one-off event?” Allaire asks.

The answer, according to her 2018 study, is clearly the former. In 2015, the same year that the nation learned of Flint’s lead contamination, she found that about 21 million other people in the U.S. were receiving water from utilities that violated the Safe Drinking Water Act. People who lived in rural, low-income areas seemed to be most at risk of exposure to contaminants linked to a range of health problems—from a bout of diarrhea to cognitive impairment or cancer.

“As we saw in Flint, and have seen repeatedly across the country, 9 out of 10 violations don’t face any formal enforcement action by the state or federal government,” says Erik Olson, senior strategic director for health and food at the Natural Resources Defense Council (NRDC). “What we have is comparable to everyone on the interstate speeding and virtually no one being pulled over or getting tickets with any penalty.”

Outdated Standards

Even when the law is enforced, advocates lament that the standards used are often outdated. The current federal drinking-water standard for nitrate, for example, went into effect in 1992 at 10 parts per million. Yet research has found (PDF) that levels less than one-tenth of that legal limit may raise the risk of cancer and other health issues. In early 2019, the EPA suspended plans to reevaluate the nitrate standard.

The EPA did propose an update in October 2019 to its rules on lead and copper, which had not been touched since 1991. Meanwhile, the U.S. House of Representatives approved new

legislation this past July that authorizes \$22.5 billion to replace a portion of the country's estimated 6 million to 10 million lead service lines that remain, connecting water mains to homes in Flint, Newark, and elsewhere.

Kail says that the AWWA supports the revision. "As long as there is lead in contact with the water, some level of risk remains," he says. "So the best cure is to get the lead out."

Advocates argue the rules still won't go far enough or come fast enough. And they suggest the same generally holds for the EPA's actions or inactions on drinking-water quality. Of most concern, they say, are the potentially hazardous contaminants that still lack a standard. "The law really is broken and needs to be fixed if it is going to protect the public," Olson says.

The EPA's current process for developing new standards, defined in the 1996 amendments to the Safe Drinking Water Act, needs to be sped up and strengthened, Olson and other advocates say. The EPA's Unregulated Contaminant Monitoring Rule (UCMR) allows the agency to select up to 30 unregulated pathogens and pollutants to be monitored every five years. Public drinking-water systems serving at least 10,000 people, along with a representative sample of smaller systems, must periodically test for these contaminants. The agency uses the data in considering future drinking-water standards.

So far, the only new chemical that the agency has come close to regulating through the process is perchlorate, a component of rocket fuel, munitions, and fireworks. Studies suggest that exposure may derail brain development of fetuses and infants. The EPA determined in 2011 that the contaminant required regulation.

But this June, the agency reversed course and announced that, taking into consideration "the best available science and the proactive steps that EPA, states and public water systems have taken to reduce perchlorate levels," it would not regulate perchlorate. That decision is now in litigation. "The EPA just hasn't had the spine to issue any regulations off the contaminant candidate list," Olson says.

Six perfluorinated chemicals were monitored via the UCMR between 2013 and 2015. This past February, the EPA announced preliminary regulatory determinations and opened up comments for two of those chemicals, PFOA, or perfluorooctanoic acid, and PFOS, or perfluorooctanesulfonic acid.

Meanwhile, several states, including New Jersey and New Hampshire, have moved ahead with their own regulations, some of which go beyond PFOA and PFOS—the legacy PFAS compounds that are already being phased out—to include more of the potentially thousands of extremely persistent synthetic chemicals that belong to the same class.

Philippe Grandjean, a professor and environmental medicine research unit head at the University of Southern Denmark and adjunct professor of environmental health at the Harvard T.H. Chan School of Public Health in Boston, warns of a potential regrettable replacement problem.

“We see other PFAS popping up,” he says. “Which do you prefer, a devil you know or a devil you don’t know? It looks like we’re currently regulating so that we’ll get more devils that we don’t know. And it could well happen that some of those devils may act together to be even more hazardous than those we banned.”

Pathogens and Pesticides

Pathogens remain a serious issue, too. E. coli in drinking water has caused deadly outbreaks (PDF). Norovirus, giardia, and cryptosporidium have also contaminated drinking-water supplies in recent years. But the pathogens perhaps highest on the minds of experts today are those that grow in pipes.

Legionella, the bacterium that causes Legionnaires’ disease, a type of pneumonia, offers a critical case in point. It poses a microbiological threat with widespread consequences.

In Flint, the same issue that caused the release of lead into the drinking water also resulted in deadly cases of Legionnaires’ disease in the surrounding community. Repeated outbreaks at Quincy, Ill., veterans home have killed more than a dozen people since 2015. And in May 2019, a custodian died from Legionnaires’ disease, among other causes, after being infected at Kettering Fairmont High School in Kettering, Ohio. The school’s water tested positive for Legionella bacteria this July, and a current custodian has tested positive for the disease. Spokespeople with the Illinois veterans home and the Ohio high school say that measures have been taken to reduce the risk of further infections.

When buildings go unused for long periods of time, stagnant water can become a breeding ground for the bacteria. “The big problems are when you have water that sits a long time without chlorine. Legionella love that, and reproduce and bloom,” Olson says. “With schools and all sorts of other commercial and other buildings where water has been sitting for a long time with little use, it could be a massive problem. That’s a real worry post-COVID.”

Agricultural practices remain implicated in much of the nation’s tainted drinking water. Studies have shown that pesticides pose a serious threat. For example, atrazine has been associated with low birth weight in babies.

“Every spring in the Midwest, a pulse of atrazine comes off the fields. Tough luck on you if you happen to be carrying a child during that period,” says Sedlak at UC Berkeley, adding that regulatory standards might still be met because EPA regulations average numbers over the course of an entire year.

Neonicotinoids are another example. “Neonics are wonderful [from a human health perspective] because they target receptors specific to insects,” Sedlak says. “But after a chemical reaction with chlorine (PDF), the product is something that is likely to target people.” Limited data hints at potential health effects ranging from respiratory, cardiovascular, and neurological issues to birth defects.

Excess fertilizer applications on farms also trigger major algal blooms that can contaminate drinking water. Toxins produced by algae in Lake Erie fed by runoff from farms in the watershed contaminated the Toledo, Ohio, drinking-water system in the summer of 2014. Almost half a million people were told to avoid drinking, bathing, or cooking with their tap water for a couple of days; 110 people got sick.

It was neither the first nor the last time that such algal toxins threatened public health. Residents of Carroll Township, Ohio, received a similar warning in September 2013. And in July 2018, authorities in Salem, Ore., advised children and the elderly not to drink the city's water.

Seeking Solutions

When Duane Munsterteiger's 1-year-old son got sick with respiratory syncytial virus (RSV) in 1993, the idea that his family's drinking water could be to blame didn't cross his mind. "It was the most beautiful-tasting water you'd ever want," says Munsterteiger, of Ogilvie, Minn.

But subsequent tests of the water from his well found high levels of nitrate, which research suggests may be associated with respiratory infections such as RSV.

In addition to drilling a new, deeper well to supply his home, Munsterteiger also has adopted a number of environmental conservation practices in his farming. He uses cover crops and rotates his cows to graze different sections of his land, improving the health of the soil and minimizing runoff, and thereby reducing the nitrate that seeps into the groundwater. He knows that groundwater could become the water that his family members, and his cows, drink. "Good, clean water is important for our animals, too," Munsterteiger says.

Targeting the source of contaminants is a particularly effective way to tackle dirty water. This might mean using cover crops to limit agricultural runoff, as Munsterteiger did, or preventing the discharge of industrial chemicals.

The Clean Water Act, in theory, regulates discharges into U.S. waters and therefore protects sources of drinking water. However, this year the Trump administration issued a new regulation, the Navigable Waters Protection Rule, that narrows the scope of the Clean Water Act by revoking federal protections for millions of miles of streams and millions of acres of wetlands. The NRDC and other environmental groups have filed a lawsuit to stop the decision.

"If we don't have a strong Clean Water Act, we'll never have clean drinking water," says Lynn Thorp, national campaigns director for the nonprofit Clean Water Action. "We need to put equal effort upstream."

In this regard, too, some states are stepping up to fill in the gaps. Munsterteiger is among farmers participating in the Minnesota Agricultural Water Quality Certification Program, which offers incentives, including financial assistance for practices, such as cover cropping, that can reduce the flow of agricultural pollutants into waterways. Other techniques to prevent contaminants

from sullyng source water include installing wood chip bioreactors on farms to reduce nitrate pollution.

Allaire and other water experts suggest further strategies for reducing drinking-water threats, such as increasing funds for the EPA to more quickly identify and regulate contaminants and upgrading water systems infrastructure. They also underscore the need for more technological solutions both at the drinking-water source and during treatment, while expressing concern that today's technologies—from carbon-activated filtration to reverse osmosis—are not being fully leveraged.

Joel Ducoste, a professor of civil, construction, and environmental engineering at North Carolina State University in Raleigh, underscores one key challenge: Many of the emerging contaminants of concern for drinking water, such as PFAS, were previously unknown. “We didn't know it was there, so we didn't engineer systems to be specifically effective in their removal,” he says. “We're learning a lot now, working on chemical methods as well as biological methods to see how we might try to remove some of these compounds.”

It tends to be the small systems that lack the means to install or even maintain operation of the latest treatment technologies. Lanare, a small unincorporated community outside of Fresno, Calif., received more than \$1 million from the state to install a treatment plant to remove the arsenic that had chronically contaminated its drinking water.

The facility was built but only stayed online for about six months before the community had to abandon it. “It wasn't affordable over the long term to keep it up,” says Ryan Jensen, the community water solutions coordinator for the Community Water Center, a nonprofit organization based in the Central Valley.

Contaminated drinking water disproportionately affects small water systems, which serve predominantly rural, low-income communities with relatively high percentages of people of color. Sometimes those systems can't even afford the salary of a full-time operator. Florencia Ramos' hometown of El Rancho has only 65 people. The city of Lindsay has just over 13,000. “A lot of these folks are farmworkers, who are [unwittingly] helping to poison themselves,” says Anne Schechinger, a senior analyst with the nonprofit Environmental Working Group.

There is now a push to build economies of scale so that small systems don't have to go it alone. Kentucky has been a leader in water system consolidation. The state has gone from more than 3,000 systems in the 1970s to fewer than 800 systems in 2018. But such consolidations don't always go so smoothly.

Just a few miles down the road from El Rancho is Tooleville. For a long time, the small town dealt with high levels of nitrate. Other contaminants include hexavalent chromium, the compound that garnered notoriety from the movie “Erin Brockovich.”

Tooleville has been trying for years to connect its water system with that of the neighboring city of Exeter. But it has run into political pushback. Exeter voted last year to reject Tooleville's plea and has tabled the talks.

"Unfortunately, that's not unique," says Michael Claiborne, an attorney at the Leadership Counsel for Justice and Accountability, a nonprofit organization in Sacramento. "Few consolidations have gone smoothly. I've seen a lot of situations where politics are a barrier, and there's an unwillingness to serve nearby communities." He says that more than 90 percent of Tooleville residents are Latino and that the city council of Exeter is 100 percent white.

Benjamin Cuevas, a resident of Tooleville, says that he and his wife, Yolanda Cuevas, have been careful to make sure their three daughters and two grandchildren do not consume any of the water out of their taps. Yolanda Cuevas rinses the kids down with bottled water after they shower. And she insists that they also use bottled water to brush their teeth.

The Cuevases and Ramos have different problems, but they share a lot of the same concerns—and aspirations.

"I wish a lot more could be done so that we could have clean water," Ramos says. She adds another important strategy to improve drinking-water quality: "I urge people to be involved, to go to meetings, to give your input."

"I hope we can get this solved soon," Benjamin Cuevas says. "These problems have been going on a long time."

Editor's Note: This article was supported by funding from the nonprofit organizations Park Foundation and Water Foundation.

New technology turns manure into drinking water in Dane Co.

Posted: September 15, 2020 5:47 PM

Updated: September 15, 2020 7:11 PM

by Stephanie Olson

<https://www.channel3000.com/new-technology-in-dane-co-turning-manure-into-drinking-water/>

TOWN OF SPRINGFIELD, Wis. — Dane County is turning cow manure into drinking water.

Dane County Executive Joe Parisi along with AQUA Innovations, GL Dairy Biogas and three local dairy farms cut the ribbon on new technology that turns manure into drinkable water.

The nutrient concentration system cleans manure through a series of ultrafiltration and reverse osmosis filters before discharging the remaining clean water into Pheasant Branch Creek, according to the release.

“Out of one pipe you get a nutrient concentration that can be used and applied where necessary and reduces the need for additional fertilizers,” said County Executive Parisi.

“On the other end, just down the stream behind us, there is clean water that comes out that is cleaner than the water that is in there right now,” said Parisi.

The \$1.6 million project is located in the Town of Springfield.

According to a release, the community nutrient concentration system is believed to be the first in the United States.

Will Turning Seawater Into Drinking Water Help Water Shortages?

With water supplies becoming ever more scarce around the world, many are turning to treating seawater to solve the problem.

By Christopher McFadden

September 16, 2020

<https://interestingengineering.com/will-turning-seawater-into-drinking-water-help-water-shortages>

Believe it or not, but there is a growing problem with getting clean, drinkable freshwater in many parts of the world. Through a combination of human activities and climate change, many predict that a serious global water crisis will soon be upon us.

For this reason, researchers are looking for solutions to create freshwater artificially. Called desalination, could turning salty water, like seawater, into fresh water be the solution we've been looking for?

What is the fresh water crisis?

Our "Blue Planet" is aptly named. With roughly **70%** of its surface covered in water, it would seem inexplicable that water could be considered a scarce resource in many parts of the world that are not even desert areas.

The problem is that most of this water is seawater, which is not exactly potable, as it is literally saturated with salt. Of the Earth's water, only around **3%** of it is fresh and safe to drink.

But, only around **1%** of the freshwater available is actually readily accessible for human use. The vast majority of the rest is locked up in glaciers, ice caps, permafrost, or buried deep in the ground.

This means that only around **0.007%** of the water on the Earth is actually available for use by our ever-growing global population. Another problem is that this easily accessible freshwater is not evenly distributed around the world.

As drinkable water is essential for life on Earth, this is not ideal for places existing in "water scarcity". But we also use water to produce food, clothing, build things like computers and cars, and for sanitation, to name but a few things.

It is vital for all aspects of human life.

The National Geographic explains why, "due to geography, climate, engineering, regulation, and competition for resources, some regions seem relatively flush with fresh water, while others face drought and debilitating pollution. In much of the developing world, clean water is either hard to come by or a commodity that requires laborious work or significant currency to obtain."

Another problem is that the amount of fresh water on the planet has remained relatively constant for billions of years.

In fact, it is possible that you have, at some point in your life, ingested water molecules that were also drunk by the dinosaurs, Julius Caesar, or another historical figure. Quite a remarkable thought.

Rising global temperatures over the last few decades also appear to be increasing the likelihood of extreme weather events, including droughts in susceptible areas of the world. For the affected areas, water-shortages are a very serious problem.

With the population growing every year, and overuse of already dwindling water supplies for things like agriculture or disposable consumer goods, some parts of the world are facing a very real "freshwater crisis".

But mankind is nothing but ingenious. Can we use our technology to limit the impact of this crisis? Perhaps even "create" freshwater?

Let's find out.

Is it safe to drink saltwater from the sea?

The short answer is, of course, no. Drinking saline water, like seawater, can be deadly for human beings (and many other organisms).

Seawater, as we are sure you more than aware, contains a lot of salts. When you drink it, you are taking in both water (which is good) but also these salts.

While you can quite happily consume a small amount of salt, the content in seawater is considerably higher than your body can effectively process.

The cells of your body do depend on sodium chloride (table salt), primarily the sodium content of it, to maintain the body's chemical balances and reactions. But too much of it can be deadly.

This is because your kidneys, specifically the nephrons, can only make urine that is less saline than seawater. This means that if you were to exclusively drink seawater, it would take more water to dilute the salt and pee it out than the water you received from drinking it.

In other words, you would have a net water loss. For this reason, you would eventually die of dehydration (and become increasingly thirstier over time) if your only source of water was seawater.

For this reason, you should never drink significant amounts of seawater.

What methods are there to desalinate water?

With such a small percentage of the Earth's total available water as freshwater, you may wonder if there is a way we can tap the enormous reservoir of other water sources on Earth, like the sea. As it turns out we can, albeit with great effort and expense.

At present, there are at least three main methods of desalination:

Thermal desalination (distillation).

Electrical desalination.

Pressure desalination (reverse osmosis).

Thermal desalination, aka distillation, is by far the oldest of the three and has actually been in use for thousands of years. Saltwater is boiled, then the steam is cooled and condensed as fresh water, leaving the salt crystals behind in the heated vessel.

However, this method requires a significant investment in energy to achieve. More modern methods, according to [Stanford University](#), "make use of various techniques such as low-pressure vessels to reduce the boiling temperature of the water and thus reduce the amount of energy required to desalinate."

This form of desalination is widely used in places like the Middle East, where the readily abundant hydrocarbon resources help drive down the cost of fuel. Thermal desalination tends to consist of three major, large-scale thermal processes.

These are:

Multistage flash distillation (MSF).

Multi-effect distillation (MED).

Vapor compression distillation (VCD).

Another thermal method also exists; solar distillation, This is typically used for very small production rates. It is also commonly used to produce salt for eating, by placing seawater in shallow pools and waiting for the freshwater to evaporate naturally - leaving behind sea salt.

Another way to remove salt from seawater is to use a membrane to separate out the salts. This can be achieved using either electrical current or pressure.

Again, these methods are mainly used in places with abundant sources of energy, like the United States.

Electrical desalination, one example of membrane-based desalination, makes use of electrical current to separate the molecules of salt and water. With this method, an electrical current drives ions across a selectively permeable membrane carrying the salt with it.

A selectively permeable membrane is one that allows certain molecules to pass through it to the exclusion of others. Synthetic or polymeric membranes have been created for various research and industrial processes.

There are two major electrical membrane desalination methods:

Electrodialysis (ED).

Electrodialysis reversal (EDR).

Both these methods of desalination require varying amounts of energy to achieve, depending on the salt content of the water source. While suitable for use with lower salt concentrations, it is far too energy-intensive for use on seawater.

Reverse osmosis is another form of desalination that uses pressure to drive water through a selectively permeable membrane. This process, like the others, separates the salt out of the solution.

Ostensibly similar to electrically-driven desalination, the amount of energy required for reverse osmosis at a large scale depends on the initial salt content of the water. For seawater, the energy required means it is not economically viable in most situations.

As the most common form of desalination, it might be worth exploring this process in more detail.

What is reverse osmosis and does reverse osmosis work?

As previously mentioned, reverse osmosis is a process of desalination that uses pressure to literally push water molecules through a membrane. Unlike regular filtration (where certain impurities are excluded by size), reverse osmosis involves solvent diffusion across a membrane that only allows water to pass through.

Regular osmosis involves the natural movement of a solvent from an area of low solute concentration (high water potential) to high solute concentration (low water potential) until equilibrium is achieved. In reverse osmosis, as the name suggests, water is extracted from a high solute concentration of feed water (like seawater) by applying pressure to reverse the natural flow of the solvent during osmosis.

Aside from pressure, one of the main components of the reverse osmosis process is the use of a selectively permeable membrane.

This membrane allows certain particles to go through it, primarily water, leaving behind solutes (like salt) and other contaminants. In reverse osmosis, a thin film composite membrane (TFC or TFM) is employed for just this purpose.

These membranes are manufactured primarily for water purification and desalination systems. They also have certain properties that make them useful for use in certain batteries and fuel cells.

These membranes are generally constructed from two or more layers of materials. Developed by Professor Sidney Loeb and Srinivasa Sourirajan, the semi-permeable anisotropic membranes are usually made out of polyamides.

This material has some very useful properties, including its affinity for water and its relative impermeability to certain dissolved impurities such as salt ions and other small molecules.

In typical reverse osmosis systems, feedwater, under high pressure, flows through a concentric spiral pattern of membranes that alternately separate water and contaminants before collecting the water in a product water tube in the center. For maximum efficiency, several membrane units are connected in series.

Could turning seawater into drinking water help with water shortages?

In short, yes. But it comes at a significant cost.

With the decreasing availability of high-quality freshwater, more and more communities are turning to desalination to produce drinkable water from brackish water and saltwater. Existing solutions are designed to extract the water and leave as much of the salt content behind.

Current technologies have both advantages and disadvantages depending on site-specific limitations and requirements. While some methods are promising, more technological development is needed to make it viable for large-scale production of freshwater.

Texas A & M University explain that "small-scale desalination of brackish water using solar stills is a promising method in remote locations where good-quality water for drinking and cooking is unavailable. For more widespread implementation, desalination processes need technological improvements and increased energy efficiency."

The main roadblock is the cost of the processes — specifically the energy requirements needed to produce fresh water at high volumes. For this reason, existing solutions are mainly used in regions that lack any other means of importing freshwater, on civilian and military ships, and in certain spacecraft.

However, there are some interesting developments in reducing the cost of the process. A few years ago, for example, researchers at the University of Texas, Austin, developed an innovative alternative to conventional methods.

Another promising solution is called capacitive deionization and battery electrode deionization. However, these solutions are far from being commercially viable at present.

But it is not just an out financial cost. Existing desalination plants are also harmful to the environment.

Most directly tap seawater as their source water, which can kill, or harm, fish, and other small ocean creatures as the water levels around the plant are altered. The process also tends to produce highly saline waste that needs to be disposed of.

It is for this reason that most desalination plants use brackish rather than seawater. Large desalination plants are also expensive to build, usually costing somewhere in the region of **hundreds of millions** apiece.

That being said, many companies are investing heavily in the technology, with some places, like Israel, already producing enough water to supply half the country.

For water-scarce regions, however, these kinds of plants offer a type of insurance policy for water security. California, for example, is already building a series of plants.

Many experts believe that the only way to make widespread desalination workable is to incorporate renewable energy sources to power them. Only through lowering the relative running costs, will they become economically viable.

With rising global temperatures and the increasing likelihood of droughts in many parts of the world, desalination will likely become more prevalent. If we can overcome the energy costs, and environmental costs, of the process, then desalination can conceivably become an important part of the solution in solving water scarcity.

Water shortages in US West likelier than previously thought

By Sam Metz | AP

September 15, 2020 at 6:15 p.m. MDT

https://www.washingtonpost.com/climate-environment/water-shortages-in-us-west-likelier-than-previously-thought/2020/09/15/b5ed11a6-f7b1-11ea-85f7-5941188a98cd_story.html

CARSON CITY, Nev. — There's a chance water levels in the two largest man-made reservoirs in the United States could dip to critically low levels by 2025, jeopardizing the steady flow of Colorado River water that more than 40 million people rely on in the American West.

After a relatively dry summer, the U.S. Bureau of Reclamation released models on Tuesday suggesting looming shortages in Lake Powell and Lake Mead — the reservoirs where Colorado River water is stored — are more likely than previously projected.

Compared with an average year, only 55% of Colorado River water is flowing from the Rocky Mountains down to Lake Powell on the Utah-Arizona line. Due to the below-average runoff, government scientists say the reservoirs are 12% more likely to fall to critically low levels by 2025 than they projected in the spring.

“This is a pretty significant increase over what was projected in April due to the declining runoff this year,” hydrologist Carly Jerla said.

The forecast could complicate already-fraught negotiations between Arizona, California, Colorado, New Mexico, Nevada, Utah, Wyoming and Mexico over future shares of the river that supplies their cities and farms. Those talks will draw up new agreements by 2026 over use of the river that's under siege from climate change and prolonged drought.

Some of urban and agricultural water users have been forced to conserve water to secure the river long term, but it remains overtapped. And as cities like Phoenix and Las Vegas keep growing, the region is only getting thirstier.

“We know that warmer temperatures have contributed to the drought of the last 21 years, and we know that they have exacerbated it,” Bureau of Reclamation Commissioner Brenda Burman said.

Unlike the 24-month projections that the agency uses to allocate water to the seven states and Mexico, the models released Tuesday simulate various weather and usage patterns to help water users prepare for different scenarios.

Scientists use what's called the Colorado River Simulation System to project future levels of the two reservoirs. They employed "stress testing" techniques based on river flows since 1988 to determine potential shortages if drought conditions persist.

Arizona, Nevada and Mexico agreed to cuts for the first time under a drought contingency plan signed last year. The water level in Lake Mead sits at 1,083 feet (330 meters). When projections drop below 1,075 feet (328 meters), Nevada and Arizona will face deeper cuts mandated by the plan.

Stress test models suggest a 32% chance that Lake Mead will fall below 1,075 feet by 2022 and a 77% chance by 2025. The model's median estimates indicate Lake Mead will drop by 35 feet (11 meters) by 2026.

The water level in Lake Powell is at 3,598 feet (1,097 meters), and estimates suggest it could drop by 50 feet (15 meters) by 2026.

Burman said the models provide valuable information to cities and farms preparing for the future as drought persists and average temperatures trend upward. She said drought contingency plans are an effective mechanism to address the projected shortages — for now.

"I think what the projections are showing us is we have greater uncertainty than we did last year," she said.

Wildfires can leave toxic drinking water behind – here's how to protect the public

Andrew J. Whelton, Purdue University

Published 7:01 am CDT, Thursday, September 17, 2020

<https://www.thetelegraph.com/news/article/Wildfires-can-leave-toxic-drinking-water-behind-15574187.php>

(The Conversation is an independent and nonprofit source of news, analysis and commentary from academic experts.)

Andrew J. Whelton, Purdue University and Caitlin R. Proctor, Purdue University

(THE CONVERSATION) Less than halfway through the 2020 wildfire season, fires are burning large swaths of the western U.S. As in previous years, these disasters have entered populated areas, damaging drinking water networks. Water systems have lost pressure, potentially sucking in pollutants, and several utilities are warning of possible and confirmed chemical contamination.

We are environmental engineers who help communities affected by disasters, including support for responses to the 2017 Tubbs Fire and 2018 Camp Fire in California. As we concluded in a recently published study of burned areas, communities need to upgrade building codes to keep wildfires from causing widespread contamination of drinking water systems. They also need to act more aggressively to protect residents from possible toxic exposure immediately after fires.

How wildfires poison water systems

After both the 2017 Tubbs Fire in California's Sonoma and Napa counties and the 2018 Camp Fire in Butte County, California, drinking water tests revealed a plethora of acutely toxic and carcinogenic pollutants. Water inside homes was not safe to use – or even to treat.

Water pipes buried underground and inside of buildings were extensively contaminated. Both fires destroyed fire hydrants, water pipes and meter boxes. Leaks and ruptured hydrants were common.

After the fires passed, testing ultimately revealed widespread hazardous drinking water contamination in areas affected by both fires. Evidence suggests that the toxic chemicals originated from a combination of burning vegetation, structures and plastic materials.

Chemicals in the air may have also been sucked into hydrants as water pipes lost pressure. Some water system plastics decomposed and leached chemicals directly into water. Toxic chemicals then spread throughout pipe networks and into buildings.

Limited water testing by state and local agencies showed that benzene and naphthalene were present at levels that could cause immediate physical harm. These chemicals, as well as methylene chloride, styrene, toluene and vinyl chloride, exceeded limits for longer-term exposure.

All of these substances are volatile organic compounds – chemicals that readily evaporate into the air at room temperature. Many of them cause cancer. All can cause vomiting, diarrhea and nausea after a brief high-concentration exposure.

Simply running a cold water faucet can release volatile organic compounds from tap water into the air. Heating water for showers or cooking makes them enter the air even faster, creating a more severe inhalation risk. Some can also be absorbed through the skin.

Protecting the public

In our view, agencies should not underestimate health hazards posed by fire-damaged drinking water systems. Just in the past month, after the CZU Lightning Complex Fire burned parts of San Mateo and Santa Cruz counties, California officials and a water utility issued and reissued an advisory allowing children to bathe in potentially contaminated drinking water. Five days later, when limited test results became available, both organizations recanted and said no one should bathe in the water.

To avoid this kind of error, we recommend issuing “Do Not Use” orders in the wake of major fires to protect the public before water testing results are available. We believe it is acceptable to use water for fire fighting and toilet flushing, but not for purposes that involve ingestion, skin exposure or inhalation, such as bathing or cooking.

Under no circumstance should people be told to smell the water to determine its safety, as officials recommended for months after the Camp Fire. Many harmful chemicals have no odor, so only testing can determine safety.

Advisories to boil water should not be used, since boiling speeds up the release of toxic chemicals into the air. Nor do we recommend “Do Not Drink/Do Not Boil” advisories, which allow bathing in contaminated water.

Before agencies lift or modify advisories, we believe they should be required to carry out thorough chemical screens of water systems. Too often, officials charged with protecting public health fail to take this step, exposing people to needless risk. More typically, they act like California’s San Lorenzo Valley Water District, which lifted a post-wildfire “Do Not Drink/Do Not Boil” order in parts of its territory on Sept. 7, 2020 with a notice to ratepayers that “If test results reveal anything harmful, you will be advised promptly.”

Agencies also need to test buildings for water contamination. Home drinking water quality can differ from room to room, so reliable testing should sample both cold and hot water at many locations within each building.

While infrastructure is being repaired, survivors need a safe water supply. Water treatment devices sold for home use, such as refrigerator and faucet water filters, are not approved for extremely contaminated water, although sales representatives and government officials may mistakenly think the devices can be used for that purpose. While survivors wait for safe water to return, government agencies should ensure that reliable emergency water supplies are available.

Update building codes for future fires

Our research underscores that community building codes are inadequate to prevent wildfire-caused pollution of drinking water and homes.

Adopting codes that require builders to install fire-resistant meter boxes and place them farther from vegetation would help prevent infrastructure from burning so readily in wildfires. Concrete meter boxes and water meters with minimal plastic components would be less likely to ignite. Some plastics may be practically impossible to make safe again, since all types are susceptible to fire and heat.

Installing one-way valves, called backflow prevention devices, at each water meter can prevent contamination rushing out of the damaged building from flowing into the larger buried pipe network. Water main shutoff valves and water sampling taps should exist at every water meter box. Sample taps can help responders quickly determine water safety.

As the past several years have shown, many communities need to be better prepared for wildfires. Two years after the Camp Fire, the town of Paradise, California is still clearing and repairing its water system, at an estimated cost of up to US\$150 million. We believe the time to upgrade in other towns is now.

This is an updated version of an article originally published on Aug. 3, 2020.

Is Safe Water a Human Right? Securing Water for Communities Around the World

Elizabeth Aquino

September 17, 2020

<https://www.kcet.org/shows/global-mosaic/is-safe-water-a-human-right-securing-water-for-communities-around-the-world>

How clean is the water you're drinking? In many places around the world, safe drinking water is still not a basic commodity, even though it is essential to sustaining communities, improving public health and combating the spread of bacteria and diseases.

Access to clean water for drinking and household use remains a challenge in places as far apart as Mumbai, India and rural communities in West Virginia. Industrial processes, chemical factories, mountaintop mining and hydraulic fracturing contribute to poisoning water supplies, damaging landscapes, threatening wildlife and putting lower income communities at risk. Private ownership of municipal water systems also contributes to water insecurity around the world, as these large corporations can focus more on growing their profit than on securing water access for every resident.

In the "Global Mosaic" episode "Water For Life," Indian filmmaker Zulekha Sayyed and West Virginia photojournalist Paul Corbit Brown dive deep to answer the question, "Is clean water a basic human right?" and seek solutions to secure safe water for everyone in their communities.

Mumbai, India

In the sprawling metropolis of Mumbai (population 20 million), Sayyed has been reporting on water issues since she was a teenager, when she first contributed stories to India's innovative Video Volunteers reporting network. Millions of Mumbai's residents lack access to clean running water in their homes. They have to wait in line at public taps or carry containers to water trucks; women and children can spend hours each day just fetching water.

Although bottled water is available, if one doesn't have a water connection at home "it's very difficult to buy water," Sayyed said in the documentary. "When they are working minimum wage, much of their income can go to buying water."

According to WaterAid, in India about 166 children under the age of 5 die every day from diarrhea, due to India's poor water and sanitation systems. Some families use well water to drink, cook and bathe, but that water is not sanitized. "Children get sick after drinking this water," one Mumbai resident explained to Sayyed. "The water often gets mixed with sewer water and is

unhygienic.” Another mother said, “The water we drink is so filthy, even an animal won’t drink it.”

India’s water crisis is perpetuated by the privatization of water, coupled with government inaction. Large companies own many of India’s water delivery systems and can raise prices for profit. Meanwhile, the lower income urban neighborhoods and rural villages where access to clean water is limited and water prices are high, are often neglected by the government.

“Mumbai has ample water, double than the required water supply. But there isn’t a political will to supply water to all,” said Sitaram Shelar, one of the founders of Pani Haq Samiti (Water Rights Committee). “The municipal government decided to give water to everyone, but there was a hitch. They wouldn’t give water to people living in informal dwellings,” Shelar said, referring to makeshift homes in India’s low-income neighborhoods.

Lack of access to safe tap water has even deadlier effects now as the COVID-19 pandemic spreads. The World Health Organization (WHO) advises that one of the best ways to beat the virus is to practice frequent hand washing. But living in close quarters during the pandemic and without clean running water, India’s infection rate continues to rise.

Pani Haq Samiti’s right to water campaign is making strides toward securing safer water for Mumbai’s residents by raising awareness of the issue and local organizing. Their volunteers go house-to-house to help residents fill out online forms requesting the installation of water taps. Over the past three years, they submitted applications for 5,500 families and so far about 10% have received running water connections into their homes. Now the organization is working to secure safe water for millions of Mumbai’s slum residents who have lost their jobs due to the COVID-19 pandemic.

West Virginia, United States

Contaminated water is also a major issue in West Virginia, with many counties deemed among the “worst in the nation” in 2019 for various drinking water violations. A state known for its mountainous hilltops, crisp fresh air and stunning, natural views, has a long, complicated history with coal-mining, and in recent years with fracking for natural gas. Many of the municipal water systems are owned by large global corporations. Although industries bring the state revenue and provide jobs to many West Virginia residents, they have also left some communities with toxic, polluted groundwater.

In 2014, a chemical spill affected 300,000 residents in Charleston, West Virginia after 10,000 gallons of chemicals used in the coal-mining process were spilled into the capital city’s municipal water source. The spill left citizens with water that was too toxic to clean, bathe, drink and cook with for many days. Toxicified water has been a problem for nearly four decades, particularly in West Virginia’s “coal country,” where some local journalists and citizens believe that speaking out against industry puts them at risk.

“We're dying here,” West Virginian native Jesse Johnson told Paul Corbit Brown in “Water for Life.” “We're being poisoned to death by our own industries that employ us, and the message is not getting out to the rest of the nation. It's not even getting out to us.”

Thomas Linzey, Senior Legal Council for the Center for Democratic and Environmental Rights explains. “Whether you're talking about mountaintop removal in West Virginia, whether you're talking about this frack water that's being pumped out of the holes by the natural gas corporations, you're talking about stuff that ruins the environment forever. You're talking about aquifers that are polluted, which you cannot fix.”

Upgrading Building Codes Can Curb Drinking Water Contamination Due to Wildfires

BY

Andrew Whelton &

Caitlin Proctor,

The Conversation

PUBLISHED

September 20, 2020

<https://truthout.org/articles/upgrading-building-codes-can-curb-drinking-water-contamination-from-wildfires/>

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This is an updated version of an article originally published on Aug. 3, 2020.

The Devastating Flint Water Crisis Wasn't Even the City's Worst Lead Exposure Event of That Decade

Researchers found some interesting data from monitoring the city's sewage sludge.

SIDDHARTHA ROY & MARC EDWARDS

SEPTEMBER 20, 2020

<https://www.motherjones.com/environment/2020/09/the-devastating-flint-water-crisis-wasnt-even-the-citys-worst-lead-exposure-event-of-that-decade/>

Sometime in 2021, a much-anticipated era of lead-free pipes will begin in Flint, Michigan. Contractors have replaced more than 90 percent of the city's pure lead and galvanized-iron pipes connecting homes to the water mains, and they are hard at work inspecting and replacing the roughly 2,500 that remain. Flint will likely become only the third major American city—after Lansing, Michigan and Madison, Wisconsin—to have replaced all its lead pipes. They are also the first to replace all the galvanized iron connections, another source of lead, and to pay for all the work without charging customers. Blood testing and residential water testing suggest that the lead levels in Flint water are now at historic lows.

The improvements mark an end to Flint's disastrous history with lead pipes, which resurfaced in April 2014 when the city switched the source of its public water from Lake Huron treated by the city of Detroit to the Flint River, while discontinuing the use of corrosion control chemicals. The switch triggered an alarming rise in lead levels in the city's drinking water, a corresponding spike in children's blood lead levels, and a national scandal that led the city to switch back to water from Detroit in October 2015 while more than tripling the corrosion control dose. Ultimately, after revelations of deaths from two outbreaks of Legionnaire's disease caused by the initial switch, a federal emergency was declared by President Obama in January 2016.

Our early studies of lead levels in Flint residences helped expose the water crisis. Now, in complementary studies published in Water Research and Environmental Science: Water Research and Technology, we've found that lead levels in the water were not as bad as first feared: Water lead levels did increase sharply during the first few months of the water crisis, but for most of the time the city was receiving its water from the Flint River, the average levels of lead in drinking water were indistinguishable from those before the switch. In fact, our research shows that the Flint water crisis wasn't even the city's worst lead exposure event of that decade.

The conclusions are based on data collected from the routine monitoring of the city's sewage sludge, or biosolids. Well before taking samples at sewage plants became a popular way to track the surge of the novel coronavirus, scientists actively analyzed sewage to monitor aspects of public health, including viral disease markers, illicit drug consumption patterns, and human gut microbiome shifts. In Flint, officials have been sampling biosolids monthly for over 25 years.

We showed that lead levels in the biosolids were strongly correlated with lead levels from our citywide sampling of Flint's drinking water, which allowed us to use the biosolid measurements to estimate average lead levels in the city's drinking water over the period from 2010 to 2019. Due to consistency in the sampling methodology and the capture of all lead released from plumbing, the biosolids measurements in Flint's case provide a much more reliable picture of citywide water lead levels than the residential water tests, which were both infrequent and used questionable methods.

We found that more than three quarters of the above-normal lead exposure during the water crisis occurred during June, July, and August of 2014. Contrary to speculation at the time, lead exposures during the rest of the 14-month crisis were in the same range as occurred before the switch. There was likely an initial spike of lead rust sloughing off pipe walls due to the discontinuation of corrosion inhibitors for the more corrosive Flint River water, which slowed down a few months into the crisis. This surprising trend is also confirmed in the blood lead data for Flint children.

Only during one month of Flint's water crisis, June 2014, did lead levels rise to a range comparable to those experienced during the country's worst water lead crisis of the 21st century. Between 2000 and 2004 in Washington DC, the fraction of the infant population with lead levels above 10 µg/dL (that is, 10 micrograms per deciliter of blood), which was the Centers for Disease Control and Prevention's "level of concern" at the time, spiked to more than 5 percent. In Flint, the fraction of children with blood lead levels exceeding 10 µg/dL did not increase at all, although the fraction with blood lead levels exceeding 5 µg/dL, a new threshold instituted by the CDC in 2012, did rise significantly.

Interestingly, our work suggests that just four years before Flint's water made national headlines, the city suffered an even worse lead exposure event. We uncovered evidence of a previously undisclosed spike in water lead levels in mid-2011, when Flint was still receiving water from Detroit. That year, lead levels were estimated to have risen 50 percent higher than during the peak of the crisis following the switch to Flint River water. There is no obvious explanation for this increase, yet it mirrors a previously unexplained rise in children's blood lead, which was attributed to "random variation." This worrisome discovery reinforces the ever-present hazard of antiquated plumbing containing lead, even when corrosion control is in place and a water system is presumably operating normally, and, ultimately, to the importance of lead pipe replacements to eliminate the threat.

The sewage data also confirms other studies that have shown dramatic improvements in Flint water’s lead levels. Biosolids tracking suggests that the protective measures taken after Flint switched back to Detroit water—including tripling the dosage of corrosion control additives and free replacement of lead faucets and all lead and galvanized pipe connections to water mains—will ultimately reduce lead levels by between 72 percent and 84 percent of the pre-crisis levels.

Still, those measures will not translate to lead-free water, since our work demonstrates that brass faucets, lead solder, and galvanized iron that remain in Flint homes will continue to leach lead—as they do in homes all over the country. Even brand new “lead-free” plumbing cannot always guarantee water lead levels below the American Academy of Pediatrics’ new recommendation of 1 part per billion for water in schools. Those facts should not detract attention from the major improvements in Flint’s water, which has already been meeting all state and federal standards for contaminant levels over the past four years.

Regrettably, the legitimate fears of residents, compounded by misinformation, bad science, and conspiracy theories that have proliferated in the “scientific dark age” of post-water-crisis Flint, have continued to undermine public trust in the water and overshadow the successes of the government-led public health response.

As residents continue to wait for elusive justice for the environmental crimes in Flint and cautiously consider a historic \$600 million settlement from the state of Michigan, we acknowledge that the lead exposures during the Flint water crisis were not as bad as first feared.

Trump Administration Invests \$268M In Rural Water And Wastewater Infrastructure Improvements In 28 States

SEPTEMBER 22, 2020

<http://www.wbiw.com/2020/09/22/trump-administration-invests-268m-in-rural-water-and-wastewater-infrastructure-improvements-in-28-states/>

(WASHINGTON, D.C.) – The Trump Administration today announced that the United States Department of Agriculture (USDA) is investing \$268 million to modernize rural drinking water and wastewater infrastructure across 28 states (PDF, 222 KB).

“Upgrading the infrastructure that delivers safe drinking water and modern wastewater management facilities will improve public health and drive economic development in our small towns and cities,” Deputy Under Secretary for Rural Development Bette Brand said. “Under the leadership of President Trump and Agriculture Secretary Perdue, USDA is a strong partner with rural communities, because we know that when rural America thrives, all of America thrives.”

Background

USDA is funding 76 projects through the Water and Waste Disposal Loan and Grant Program. These investments will help to improve rural water infrastructure for 267,000 residents. For example:

The city of Greenville, Ill., will use a \$14 million loan to replace a water treatment plant to meet current peak demands as well as the future growth of the community.

In Hulbert, Okla., the Tenkiller Utilities Authority (TUA) is receiving a \$10.6 million loan and a \$4.6 million grant to build a regional water treatment plant. The 1.8-million-gallon-per-day plant will be constructed on the western side of Lake Tenkiller at the existing plant site, in Cherokee County. TUA consists of nine rural water systems. Seven of those systems have small, operationally challenged treatment plants, and two systems purchase their water. A transmission line, two pump stations and three water storage tanks will be built to connect the systems. This project will deliver safe and sanitary water through one common plant, increase water and energy efficiency, and reduce operation and maintenance costs.

The borough of Seaside Park, N.J., will use a \$5 million loan to build an elevated water treatment facility and an emergency generator to prevent flooding. Funds will also be used to install a 30,000-gallon backwash tank and replace the water main on various streets throughout the borough.

The investments that USDA announced today are being made in Alaska, Arkansas, Colorado, Georgia, Iowa, Idaho, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Maine, Michigan, Minnesota, Missouri, North Carolina, New Hampshire, New Jersey, New York, Ohio, Oklahoma, South Dakota, Tennessee, Texas, Utah, Virginia, Washington and West Virginia. To learn more about investment resources for rural areas, interested parties should contact their USDA Rural Development state office.

USDA Rural Development provides loans and grants to help expand economic opportunities and create jobs in rural areas. This assistance supports infrastructure improvements; business development; housing; community facilities such as schools, public safety and health care; and high-speed internet access in rural areas. For more information, visit www.rd.usda.gov.

Is your drinking water toxic? This app may help you find out.

SEPTEMBER 23, 2020

by Lauren Ingeno, Perelman School of Medicine at the University of Pennsylvania

<https://phys.org/news/2020-09-toxic-app.html>

Exposure to hydraulic fracturing fluid in drinking water has been shown to increase the risk of respiratory problems, premature births, congenital heart defects, and other negative health consequences. But not all wells are created equal. Since different hydraulic fracturing—or fracking—sites use a diverse mix of chemical ingredients, often individuals and researchers are in the dark about the exact health consequences of living near a particular well.

Now, a new, interactive tool created by Penn Medicine researchers allows community members and scientists to find out which toxins may be lurking in their drinking water as a result of fracking. By typing your ZIP code into the website or accompanying app—called WellExplorer—you can view the closest fracking sites in your state, learn which chemicals are used at those sites, and view their levels of toxicity.

In a recent study, published in the journal *Database*, the WellExplorer app's creators found, for example, that wells in Alabama use a disproportionately high number of ingredients targeting estrogen pathways, while Illinois, Ohio, and Pennsylvania use a high number of ingredients targeting testosterone pathways. The information found through WellExplorer might be particularly relevant for individuals who use private water wells, which are common in rural Pennsylvania, since homeowners may not be performing rigorous testing for these fracking chemicals, according to the study's principal investigator Mary Regina Boland, PhD, an assistant professor of Informatics in the Perelman School of Medicine at the University of Pennsylvania.

"The chemical mixtures used in fracking are known to regulate hormonal pathways, including testosterone and estrogen, and can therefore affect human development and reproduction," Boland said. "Knowing about these chemicals is important, not only for researchers who may be studying health outcomes in a community, but also for individuals who may want to learn more about possible health implications based on their proximity to a well. They can then potentially have their water tested."

While FracFocus.org serves as a central registry for fracking chemical disclosures in the United States, the database is not user-friendly for the general public, and it does not contain information about the biological action of the fracking chemicals that it lists. In order to create a tool that could provide more in-depth, functional information for researchers and individuals

alike, the Penn researchers first cleaned, shortened, and subsetted the data from FracFocus.org to create two newly usable files that could be in used in WellExplorer website and app.

Because the research team also wanted to provide toxic and biological properties of the ingredients found at these well sites, they integrated data from the Toxin and Toxin Target Database (T3DB). From that database, they compiled information on fracking chemicals' protein targets (and the genes that encode those proteins), toxin mechanisms of actions, and specific protein functions. Moreover, they extracted the toxicity rankings of the top 275 most toxic ingredients from the Agency for Toxic Substances and Disease Registry, as well as a list of ingredients that were food additives as described by Substances Added to Food Inventory. The team then linked all of that information together and created a ZIP Searcher function into their web tool, so that people could easily find their exposure risks to specific chemicals.

"The information had been out there, but it was not all linked together in a way that's easy for regular people to use," Boland said.

However, Boland added that the use of chemicals at a fracking site may not necessarily mean that those chemicals would be present in the water supply, which would be dependent on other factors, such as what type of soil or bedrock is being drilled into, and the depth of both the hydraulic fracturing well and an individual's private well depth. Nonetheless, WellExplorer provides a starting point for residents who may be experiencing symptoms and want to have their water tested.

Beyond information-gathering for individuals, WellExplorer can also be used as an important tool for environmental scientists, epidemiologists, and other researchers to make connections between specific health outcomes and proximity to a specific fracturing well. From a development standpoint, this means that the research team had to be conscious of the two audiences when designing the website and app, said Owen Wetherbee, who aided in the development of WellExplorer while interning in the Boland Lab.

"Nationally, researchers are trying to link fracking to health outcomes, and I believe that a large reason why answering that question is challenging, is because different wells are using different ingredients, and so, the side effects of exposure would be different from place to place," Boland added. "What this app gives you is some information about where to start looking for these answers."

New criteria on drinking water standard add extra levels of protection for families

Reviewed by Emily Henderson, B.Sc. Sep 23 2020

<https://www.news-medical.net/news/20200923/New-criteria-on-drinking-water-standard-add-extra-levels-of-protection-for-families.aspx>

Newly published changes to NSF/ANSI/CAN 61, the drinking water product standard required in the United States and Canada, further restrict the amount of lead that can leach from plumbing products, NSF International announced today.

The significantly more rigorous requirements were approved after nearly three years of exploring various testing methods to reduce lead leaching from endpoint devices that dispense drinking water, as well as from other plumbing components.

The more stringent pass/fail criteria for certification to the standard will require the maximum amount of lead leaching to be reduced from 5 micrograms (μg) to 1 μg for plumbing endpoint devices that dispense drinking water such as faucets, and from 3 μg to 0.5 μg for other plumbing components such as connector hoses and small shut-off valves.

In-line mechanical devices and other product categories under NSF/ANSI/CAN 61 are not subject to the new requirements.

NSF International facilitates the Joint Committee on Drinking Water Additives - System Components that oversees and approves changes to NSF/ANSI/CAN 61: Drinking Water System Components - Health Effects and that began investigating lower lead options in 2017.

Revisions to the standard were approved by the Council of Public Health Consultants and ratified by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC), according to their standards development processes.

The joint committee is comprised of balanced representation from the regulatory/public health, manufacturing and consumer sectors.

"These new lower requirements for lead leaching into drinking water are important changes that add extra levels of protection for families."

"The joint committee and a special task group dedicated nearly three years to extensive review and investigation of several options and test methods to establish these more rigorous limits," said France Lemieux, Chair of the Joint Committee on Drinking Water Additives - System Components, and Head of the Materials and Treatment Section, Water and Air Quality Bureau, Health Canada.

The U.S. Environmental Protection Agency, the U.S. Centers for Disease Control and Prevention and Health Canada have determined that no level of lead is considered safe, and the American Academy of Pediatrics has called for regulations limiting exposure of lead in drinking water for schools and day care centers to no more than 1 ug/L.

Under the new standard requirements, certification of applicable products to the more stringent lead leaching criteria is optional for the next three years to allow manufacturers time to comply. On Jan. 1, 2024, all products will be required to meet the stricter requirements.

Products certified to the standard's new criteria will be required to indicate compliance on their product literature and/or packaging to enable schools and consumers to easily identify products with the reduced lead leaching limits.

NSF/ANSI/CAN 61 also covers other contaminants in drinking water.

Rural water, wastewater infrastructure in 28 states gets \$268M boost

USDA is funding 76 projects through the Water and Waste Disposal Loan and Grant Program.

Sep 23rd, 2020

<https://www.waterworld.com/drinking-water/infrastructure-funding/press-release/14184012/rural-water-wastewater-infrastructure-in-28-states-gets-268m-boost>

WASHINGTON, DC -- The United States Department of Agriculture (USDA) is investing \$268 million to modernize rural drinking water and wastewater infrastructure across 28 states.

“Upgrading the infrastructure that delivers safe drinking water and modern wastewater management facilities will improve public health and drive economic development in our small towns and cities,” Deputy Under Secretary for Rural Development Bette Brand said. “Under the leadership of President Trump and Agriculture Secretary Perdue, USDA is a strong partner with rural communities, because we know that when rural America thrives, all of America thrives.”

USDA is funding 76 projects through the Water and Waste Disposal Loan and Grant Program. These investments will help to improve rural water infrastructure for 267,000 residents. For example:

The city of Greenville, Ill., will use a \$14 million loan to replace a water treatment plant to meet current peak demands as well as the future growth of the community.

In Hulbert, Okla., the Tenkiller Utilities Authority (TUA) is receiving a \$10.6 million loan and a \$4.6 million grant to build a regional water treatment plant. The 1.8-million-gallon-per-day plant will be constructed on the western side of Lake Tenkiller at the existing plant site, in Cherokee County. TUA consists of nine rural water systems. Seven of those systems have small, operationally challenged treatment plants, and two systems purchase their water. A transmission line, two pump stations and three water storage tanks will be built to connect the systems. This project will deliver safe and sanitary water through one common plant, increase water and energy efficiency, and reduce operation and maintenance costs.

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The investments that USDA announced today are being made in Alaska, Arkansas, Colorado, Georgia, Iowa, Idaho, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Maine, Michigan,

Minnesota, Missouri, North Carolina, New Hampshire, New Jersey, New York, Ohio,
Oklahoma, South Dakota, Tennessee, Texas, Utah, Virginia, Washington and West Virginia.

Why Dangerous 'Forever Chemicals' Are Still Allowed in America's Drinking Water

The federal government still hasn't set limits for PFAS compounds. Here's how to protect yourself.

By Ryan Felton

Last updated: September 24, 2020

<https://www.consumerreports.org/water-quality/why-dangerous-forever-chemicals-are-still-allowed-in-americas-drinking-water/>

In 2014, residents of Horsham Township, Pa., near Philadelphia, learned that their water had been contaminated with potentially toxic chemicals linked to an array of health problems, including learning delays in children and cancer. Those residents include Frank and Lisa Penna, who allege in a lawsuit that their water was among the contaminated supplies.

Known as PFAS, for per- and polyfluoroalkyl substances, the chemicals in this class of approximately 5,000 substances have become notorious as much for their potential danger as for their perseverance: Because the chemical bonds that hold the compounds together don't break down easily, they last a very long time—a reality that has led to a commonly used name for the group: “forever chemicals.”

PFAS compounds are also ubiquitous, used in a range of products, from food-delivery boxes to nonstick cookware to stain-resistant clothing. But one of the most troubling routes to PFAS exposure is drinking water that has been contaminated by discharges from factories and other facilities.

Indeed, PFAS have been detected in the drinking water of more than 1,400 communities in 49 states, according to research by the PFAS Project at Northeastern University in Boston and the Environmental Working Group (EWG), an advocacy organization that estimates that 110 million people may have tap water contaminated with the chemicals.

The Environmental Protection Agency, which regulates U.S. drinking water, has been investigating PFAS since the late 1990s. It set voluntary guidelines of 70 parts per trillion (ppt) for two of the compounds combined that are most studied and believed to be dangerous: PFOA, or perfluorooctanoic acid, and PFOS, or perfluorooctanesulfonic acid. (For context, 1 ppt is the equivalent of one grain of sand in an Olympic-sized swimming pool, according to some estimates.)

But despite the agency's 20-plus years of information gathering, it still has not issued an enforceable nationwide standard on PFAS. The agency has failed to act even as more about the

risks of the chemical group has become known, and even as some scientists and environmental organizations have concluded that a far lower concentration of PFAS in water—1 ppt—is a more appropriate limit.

The EPA won't comment on a proposed 1 ppt limit, saying it would be “inappropriate to prejudge the outcome” of a regulatory process now underway.

But David Andrews, senior scientist at the EWG, says the agency should enact the stringent standard. “The scientific research supports a value of 1 ppt or lower to be health-protective,” he says.

And an examination by Consumer Reports found that while the EPA's power to regulate chemicals in water is limited, the agency has waffled for years. “The EPA hasn't taken a science-based approach to this issue,” says Brian Ronholm, CR's director of food policy. “It's imperative for Congress to pass legislation that establishes PFAS limits in drinking water.”

That lack of a national standard has implications not just for tap water but also for bottled. That's because bottled water is overseen by the Food and Drug Administration, which regulates contaminants in bottled water after the EPA sets a limit for tap water.

CR recently tested 47 bottled waters and detected PFAS in 43 of them. Carbonated waters were more likely to contain PFAS, with several—including Topo Chico, Bubly, and Polar—showing levels above the scientist-recommended 1 ppt limit. (See “[What's Really in Your Bottled Water?](#)”)

A Regulatory Vacuum

Consumer watchdogs and researchers have long called for action on PFAS. “I first asked the EPA more than 19 years ago . . . and we are still waiting for a comprehensive, national response,” says Robert Bilott, an attorney who led a class action lawsuit in the 2000s that accused the chemical company DuPont of contaminating drinking water in the Ohio River Valley with PFAS.

That battle, which led to a court-ordered study of 69,000 residents that found significant health risks, was depicted in the 2019 movie “Dark Waters.” DuPont, while denying any wrongdoing, agreed in 2017 to pay \$335 million to settle the dispute.

Frank and Lisa Penna, the Horsham Township couple, allege one possible explanation for the EPA's delay: The government itself is a major PFAS polluter and is avoiding substantial cleanup costs. In a 2016 lawsuit, the Pennas allege that PFAS migrated from the Naval Air Station Joint Reserve Base Willow Grove, near their home, into groundwater. Thousands of gallons of firefighting foam, which contains PFAS, had been dumped at the base during exercises over many years, they allege. The Pennas also claim that tests of their private well found PFOA and PFOS levels of 298 ppt and 701 ppt, respectively—up to 10 times the EPA's voluntary limit.

The Pennas' case went to trial in August. Part of the government's defense? It can't be held liable because PFAS remain "unregulated."

Navy spokesperson Lt. Gabrielle Dimaapi declined to comment on the Penna case, citing ongoing litigation. But she says the Navy has spent \$200 million investigating and responding to potential PFAS concerns and is "working collaboratively with our regulatory partners and concerned communities."

40 Years of Clues

In their lawsuit, the Pennas presented documents that they say show the government knew of the possible risks of PFAS for decades before the EPA moved to curtail their use—a claim the government denies. That includes a 1974 report commissioned by the Air Force that examined how to dispose of aqueous film forming foam (AFFF), the technical name of firefighting foam, because Air Force environmental personnel had "expressed concern for disposing of AFFFs after use."

Air Force Lt. Ronald Kroop, who led the study, elaborated on those concerns in an August 2019 deposition: "It's going in the ground," he said. "That was acknowledged, accepted." What wasn't known—and needed to be—was the impact that might have, he attested.

At his deposition, when asked whether the study was conducted to examine the potential impacts on drinking water, Kroop said: "Directly, I cannot say yes. Indirectly, most definitely."

The EPA was aware of Kroop's work. In a 1980 EPA-funded study, the agency cited the Air Force's earlier report, characterizing it as examining the "environmental problems posed by fluorochemicals," another name for PFAS.

The following year, DuPont drew headlines when it reassigned about 50 female staffers at a West Virginia plant after learning that a PFAS compound used at the site had been linked to possible birth defects in rats.

Years later, in 1999, a former staff scientist at 3M, the company that supplied DuPont with the compound, blew the whistle on his employer for having allegedly withheld crucial information about PFAS. In [a resignation letter](#) (PDF) he shared with the EPA, the employee said PFOS is "the most insidious pollutant since PCB," referring to polychlorinated biphenyls, chemicals now banned for manufacturing purposes.

A 3M spokesperson directed CR to its website, which says the company phased out the use of PFOA and PFOS in the early 2000s but still uses replacement compounds today. The company has spent \$200 million on cleanup efforts from PFAS contamination, the website says. More information about the risks of PFAS continued to emerge. In 1999, researchers at Oregon State University in Corvallis found PFAS compounds in groundwater below two military bases years after the military stopped using firefighting foam there.

The Burdensome Law

Part of the problem, researchers say, is that Congress has also made it hard for the EPA to act.

It wasn't always so. When Congress passed the Safe Drinking Water Act in 1974, it granted the EPA authority to regulate drinking water. Soon after, the agency adopted standards for about two dozen contaminants, according to research by James Salzman, an environmental law professor at UCLA.

But over the next two decades, water utilities began to push back, citing the high cost of removing contaminants, and in 1996, Congress amended the Safe Drinking Water Act. The amendments “basically gutted the law,” making future regulation unlikely, says Erik Olson, senior strategic director of health and food at the Natural Resources Defense Council (NRDC), an environmental organization.

The EPA says it has issued several drinking water regulations to “strengthen public health protection” since 1996, including revisions for arsenic, bacteria, and water served on airplanes.

But since then the EPA hasn't implemented a new standard for a previously unregulated contaminant. “The agency has not been able to muster the energy or the political will to jump through all those hoops and regulate a single new chemical through that process in 24 years,” Olson says.

Regulate As a Family

Regulating PFAS presents special challenges for at least two reasons: Thousands of the compounds are already in use, and manufacturers keep introducing new ones, though it's unclear whether they are any safer.

As a possible solution to those problems, researchers argued in a June letter to the journal *Environmental Science & Technology* that the government should manage PFAS as a “chemical class”—in other words, one standard for all related compounds.

“It takes 20 years to even consider regulating one, and we've got thousands,” says Olson at the NRDC. “It will be literally geologic time before we see regulation of most of them.” Worsening the problem is that while some companies have stopped using PFOA and PFOS, many are replacing them with less-studied PFAS compounds.

The American Chemistry Council, an industry group, says that these newer chemicals are safer and that regulating them as a class isn't reasonable, because “many PFAS chemistries have very different profiles from PFOS and PFOA.”

But the letter in *Environmental Science & Technology* said that replacement PFAS can be “equally environmentally persistent.” Other research suggests that those replacements are linked to similar adverse human health effects.

The limits of the one-at-a-time approach were underscored by [a June study in Science magazine](#) that looked at how PFAS spread underground. EPA researchers found New Jersey soil samples contaminated by new PFAS compounds—ones that have their own mouthful of a name: CIPFPECA, or chloroperfluoropolyether carboxylate. The researchers pointed to the chemical company Solvay, which has a facility near where samples were taken, as the likely source. In an accompanying piece, other researchers trying to find out more about CIPFPECAs from state regulators said their efforts uncovered almost no useful information, which “raises more questions than answers.”

Solvay told CR that it provided toxicology reports on the compounds to New Jersey and the EPA. The company said those reports—which are not public because they contain proprietary information—show that Solvay is compliant with “applicable” regulations.

But David Andrews at the EWG compared the scenario to the dearth of information on PFAS compounds when they were first discovered. “The agency has no public health information on [CIPFPECAs] and we just seem to be in the same spot three or four more decades down the line,” he says.

The Case for a Lower Level

Advocates and researchers who support the 1 ppt limit for PFAS in drinking water point to growing research linking even very small amounts to potential harm, as well as the compounds’ persistence in the environment.

One key piece of evidence is a [2013 study partly funded by the EPA](#) and led by Harvard environmental health professor Philippe Grandjean that showed a decreased vaccine response in children exposed to PFAS. Grandjean’s paper recommended a drinking water limit for PFAS of 1 ppt.

Last year, the [EWG recommended 1 ppt](#) for all PFAS, citing Grandjean’s work along with other research associating the compounds with delayed mammary gland development in rodents.

The American Chemistry council disagrees. “The science does not support a 1 ppt level,” the group says.

But some experts say even 1 ppt is too high. The NRDC, [in a 2019 report](#) (PDF), acknowledged that toxicity data is limited but said that a zero tolerance is needed “to provide an adequate margin of safety to protect public health from a class of chemicals that is characterized by extreme persistence, high mobility, and is associated with a multitude of different types of toxicity at very low levels of exposure.”

Jamie DeWitt, a PFAS researcher in the department of pharmacology and toxicology at East Carolina University’s Brody School of Medicine in Greenville, N.C., agrees. “We shouldn’t have

these compounds in the environment,” he says. “We shouldn’t have these compounds in our body.”

How to Address PFAS

Consumers can take some steps to limit their exposure to PFAS, including testing their home water, filtering their water, choosing bottled waters carefully, and avoiding products that contain the compounds. (See [“4 Ways to Avoid PFAS in Your Water.”](#))

But consumers can’t solve the PFAS problem alone, says Alissa Cordner, co-director of the PFAS Project Lab at Northeastern University. Though industry bears some responsibility, it’s unlikely to act without government action, she says.

Ideally, the EPA should set limits on PFAS in drinking water, says CR’s Brian Ronholm. But because that could take years, Congress should mandate more immediate action, he says.

Arlene Blum, executive director of the nonprofit Green Science Policy Institute, suggests that states can act more quickly to tackle the problem. “The amount of hoops that the federal government has to go through makes it really difficult,” she says.

A few states have set PFAS limits below the EPA’s 70 ppt advisory, according to American Water Works, an industry group. In 2019, Vermont set a 20 ppt limit for five PFAS compounds combined, while New Hampshire passed limits on PFOA (12 ppt) and PFOS (15 ppt). At least nine others have proposed PFAS standards.

But Linda Birnbaum, the recently retired director of the National Institute for Environmental Health Science and now a scholar-in-residence in the department of environmental sciences and policy at Duke University, says there is an even simpler solution.

“I keep asking,” she says, “Why the heck are we making chemicals that are never going to go away?”

Editor’s Note: This article also appeared in the November 2020 issue of Consumer Reports magazine.

Clarification: Comments from the American Chemistry Council were originally attributed to the FluoroCouncil, a part of the group that was split into two separate organizations in April.

Ten inventive ways Cubans tackle their drinking water problems

By Matilda Coleman

September 23, 2020

<https://upnewsinfo.com/2020/09/23/ten-inventive-ways-cubans-tackle-their-drinking-water-problems/>

Drinking water is not taken for granted in Cuba.

Sparse rainfall, a growing population, the exhaustion of water utilities, a crippling US embargo and general economic hardships are among the main reasons that there is a scarcity of drinking water in the country.

Sanne Derks, a Dutch photojournalist and anthropologist has spent months exploring Cuba's water problem.

Recently, the international photojournalism festival, Visa pour l'image, housed her photography exhibition 'Manifiesto del agua'. There, in the French town of Perpignan, caught up with her to discuss the numerous, sometimes very inventive ways the Cubans have found to tackle the problems with water access. Here are some of them.

Drinking water is promised in Cuba's new constitution

In 2019 the communist state recognized the right of every Cuban citizen to have access to drinking water. Despite some visible efforts, keeping this promise seems to be a real challenge.

Households have water tanks to help manage the problem of supply outages

There is no such thing as running drinking water hours per day, every day, Sanne explains.

For example Trinidad, a town in central Cuba, usually has 2 hours of running water every 5 days. But when a very old aqueduct – the only source of water in the area – broke, there was no supply for 20 days while repairs were carried out, so untreated water was delivered that had to be cleaned by the people themselves.

Everything is mended

In Cuba, nationalised companies are responsible for all the essential amenities, including water supply. The struggling economy has resulted in a lack of renovation, that is also often blamed on the embargo imposed by the US.

“Now, the pandemic has complicated the situation even further for Cuba, as there are little or no planes, thus even fewer supplies. Everything that can be mended in the country is mended with those limited supplies that are available,” – photographer explains.

The water is delivered in water in trucks

If the water pipes are broken or don't exist, water is delivered by trucks.

In the centre and in the outskirts, you can see people with buckets coming towards the truck refilling their water storage.

This way of supplying water is very important, but not always reliable.

Last year, fuel shortages in the country provoked by the crisis in Venezuela aggravated Cuba's water problems further. With no petrol, water trucks couldn't be used to supply people with water.

The health brigade works to check water sanitation

“These are the employees of the Health Brigade, you can see, they have a bit of authority” – says Derks pointing at one of the pictures showing the health officers whose job it is to control the quality of water.

Microsoft announces strategy to become "water positive" by 2030

by **R. Dallan Adams** in **Innovation** on September 25, 2020, 6:46 AM PST

<https://www.techrepublic.com/article/microsoft-announces-strategy-to-become-water-positive-by-2030/>

Clean drinking water is a scarce commodity around the globe. This week, Microsoft laid out its plan to help address water scarcity worldwide.

In recent months, Microsoft has revealed a series of innovative strategies to help the company reach its sustainability goals. In July, the company announced that it had used hydrogen fuel cells to power data center servers over the course of 48 hours. Earlier this month, Microsoft ended a multi-year study with positive initial results testing the reliability and practicality of underwater datacenters. On Monday, the company announced it would be "water positive," meaning it would consume less water than it would replenish, by the end of the decade.

"We're tackling our water consumption in two ways: Reducing our water use intensity--or the water we use per megawatt of energy used for our operations--and replenishing water in the water-stressed regions we operate," said Microsoft president Brad Smith in a press release.

In the release, Microsoft details the challenges associated with access to drinking water worldwide. Clean drinking water is a scarce commodity around the globe. For example, nearly 800 million people lack a basic drinking water service, per UN data. Half of all people around the globe will live in the aforementioned "water-stressed" areas by 2025, according to the UN.

Climate change is increasing water stress and decreasing access to safe drinking water. Maximizing existing clean water resources and increasing access will become critical to global public health in the years ahead.

"Getting ahead of the world's water crisis will require a reduction in the amount of water humans use to operate economies and societies, as well as a concerted effort to ensure there is sufficient water in the places it is needed most. This will require a transformation in the way we manage our water systems and a concerted effort for all organizations to account for and balance their water use," Smith said.

To address this issue, Microsoft introduced its "replenishment strategy." This will involve wetland restoration investments as well as initiatives to remove impervious surfaces such as asphalt. Reducing such surfaces "will help replenish water back into the basins," according to the company. These efforts will be focused on about 40 "highly stressed basins" proximal to Microsoft operations.

These latest initiatives are supplemental to ongoing Microsoft projects to help the company achieve its replenishment goals. For example, the company's Silicon Valley campus (set to open later in 2020) includes rainwater collection and waste treatment facilities designed to ensure that all of the campus' non-potable water will be provided by recycled sources onsite, according to Microsoft. The company's Puget Sound headquarters will reuse harvested rainwater in restroom fixtures and leverage low-flow designs projected to save nearly 6 million gallons of water each year, per Microsoft.

In Arizona, a new Microsoft data center will use adiabatic cooling allowing the company to cool the facility without water more than six months of the year. Rather than tapping water for cooling, the method uses outside air when the temperature is under 85 degrees Fahrenheit. Above this temperature threshold, the facility uses evaporative cooling similar to residential swamp coolers, according to the company.

Universities to treat water in Navajo Nation communities

By Theresa Davis | Albuquerque Journal

• Published: 3 days ago

Updated: 22 hours ago

<https://www.strib.com/news/nation-world/2020/09/27/universities-treat-water/>

Albuquerque, N.M. • Environmental science students at Navajo Technical University are often asked by their professors about how they want to give back to their Navajo Nation communities.

The top answer: by improving access to clean water.

Navajo Technical University and New Mexico Tech have teamed up to address such water issues in rural Navajo areas, starting a pilot project to build and operate filtration units for well sites across the vast reservation.

The units can treat even the dirtiest water, said Robert Balch, director of the Petroleum Recovery Research Center at New Mexico Tech and a project lead.

“So many residents on reservations have to drive sometimes 100 miles to get water, and bring it back to the house in bottles,” Balch said. “Well water is available to lot of tribes, but is not always in great shape.”

The U.S. Water Alliance estimates that 30% of Navajo residents don’t have running water, the Albuquerque Journal reported.

The universities signed a memorandum of understanding on Tuesday in Crownpoint to launch the project. The technology was invented by New Mexico Tech researcher Jianjia Yu.

Dirty water will be treated with bundles of hollow fiber membrane — thin polymer “straws” with a coating to help filter contaminants. Each straw opening is about the width of a human hair. The units can filter out salt, phosphates, nitrates and heavy metals.

Water at windmills, tanks and wells will be treated for agricultural use. But with state approval, the technology could treat drinking water supplies.

Abhishek RoyChowdhury, assistant professor of environmental science and natural resources at Navajo Technical University, said the team will work with Navajo agencies to identify areas that have the worst water quality or the most severe water accessibility issues.

“Our students will learn the science and be trained in the technology, but will also learn practical ways to get involved with the community to solve environmental science problems,” he said.

Navajo communities will learn basic upkeep for the systems. The NTU team will translate scientific terms and water data into the Diné language.

“These students know the value of water,” RoyChowdhury said. “If we can get a water filtration system to the most remote part of the reservation so people just have to drive a mile instead of 100 miles, that’s a huge benefit.”

The team will work with Pesco, a manufacturing company in Farmington. Students will begin sampling sites later this year.

EPA's New Drinking Water Rule Leaves Millions of Toxic Lead Pipes in the Ground to Contaminate a Generation of Children

September 27, 2020 By Margie Kelly

<https://www.nrdc.org/media/2020/200927>

WASHINGTON – A draft of the U.S. Environmental Protection Agency's (EPA) final revision of the Lead and Copper Rule (LCR) revealed today indicates the agency will significantly weaken public health protections against lead contaminated drinking water being delivered to millions of homes across the nation.

The following is a statement by Erik D. Olson, Senior Strategic Director for Health at NRDC (Natural Resources Defense Council):

"You can't fix the problem of lead in drinking water until you pull all the lead pipes out of the ground. But EPA Administrator Wheeler will leave millions of lead pipes untouched and allow even the most contaminated communities to take 33 years to remove them. Much more aggressive action is required; abandoning an entire generation of kids to drinking this powerful neurotoxin for decades simply is not good enough."

The revised LCR will allow most of the 6 to 10 million lead pipes that deliver water to homes across the country to remain in use permanently, Replacing these pipes would be the best way to ensure every person, wherever they live, will get water that is safe from lead. In addition, the agency delayed the deadline for even the nation's most contaminated water systems to remove lead pipes from about 14 years to the new weakened rule's deadline of more than 33 years. There is no safe level of lead exposure.

EPA data confirms that lead-contaminated water occurs in thousands of communities across the country, but there is unequal access to safe drinking water, and particularly to water that is free from excessive lead contamination. A community's predominant race has the strongest correlation with bad water and inadequate response to violations, according to an analysis of EPA data by NRDC, Environmental Justice Health Alliance, and Coming Clean published in 2019.

Background:

While the EPA tinkered with monitoring and other provisions to make a few modest improvements in the first big update to the LCR in nearly 30 years, key provisions fail to improve public health protection or to reduce the complexity of the rule, including:

- **Delays Deadline for the Most Contaminated Water Systems to Replace Lead Service Lines from 14 Years to 33 Years.**

This timeline is reckless. Flint, Michigan and Newark, New Jersey will replace their lead pipes within four years, and bipartisan legislation spearheaded by Rep. Chris Smith (R-NJ) and Rep. Henry Cuellar (D-TX) (H.R. 7918) would generally require water utilities to replace lead service lines within 10 years.

- **Fails to Require Replacement of All Lead Service Lines.**

Removing every lead pipe is essential. Even the water industry recognizes that to reduce the threat of lead contamination of drinking water, communities should identify and remove lead water pipes.

- **Changes Lead Monitoring.**

The final rule prohibits tactics for gaming the system that some utilities had used to avoid detection of high levels of lead, though the EPA had already issued guidance in February 2016 effectively banning these tactics.

- **Leaves Outdated 15 Parts Per Billion of Lead “Action Level” Unchanged.**

Despite evidence that most water systems could meet a stricter action level, the final rule leaves the 15 ppb Action Level in place, while adopting a weak “trigger level” of 10 ppb. The action level and trigger level are both based on the 90th percentile of lead detected at high-risk homes.

- **Refuses to Establish an at the tap Maximum**

While there is no safe level of lead, EPA could and legally must set a maximum contaminant level (MCL) that would be as close to the health goal of zero as is feasible. Yet the revised LCR does not set an enforceable MCL. In comparison, Canada recently set 5 ppb as a maximum, and the EU recently recommended that its maximum lead level in drinking water be dropped from 10 to 5 ppb. While a 26 year-old court decision allowed EPA to avoid setting a lead MCL, we now know much more about lead in tap water than we did then, leading the primary drafter of the 1991 LCR to urge in 2020 that the agency set an MCL for lead to improve protections.

- **Requires Limited (Likely Misleading) Lead Testing of Schools and Daycares.**

The rule requires utilities to collect an inadequate number of lead samples at schools and childcare centers. They are to test 20 percent of the schools and childcares that they serve each year; only five samples must be checked per school and two samples per childcare. This limited, unrepresentative data set will not detect many of the lead problems and therefore will provide inaccurate information about the risk of lead in drinking water. This is likely to provide a false sense of security to many parents and staff.

Texas city declares disaster after brain-eating amoeba found in tap water

UPDATED ON: SEPTEMBER 26, 2020 / 3:02 PM / CBS/AP

<https://www.cbsnews.com/news/brain-eating-amoeba-houston-area-tap-water-brazosport-water-authority/>

Officials in the city of Lake Jackson, Texas, issued a disaster declaration on Saturday in response to drinking water contaminated with a brain-eating amoeba. The city is under a "do not use water order," and has requested an emergency declaration from the state.

"The City of Lake Jackson, County of Brazoria, Texas, is facing significant threats to life, health and property due to contaminated drinking water," the city said in its emergency request to Governor Greg Abbott. "The impact of this threat is severe. The potential damages include: sickness and death."

Mayor Bob Sipple wrote that the incident "is of such severity and magnitude" that the city cannot control the threat on its own.

The Texas Commission on Environmental Quality warned the Brazosport Water Authority late Friday of the potential contamination of its water supply by *naegleria fowleri*. The authority initially warned eight communities not to use tap water for any reason except to flush toilets, but on Saturday it lifted that warning for everywhere but Lake Jackson. The city of more than 27,000 residents is the site of the authority's water treatment plant. The advisory also was canceled for two state prisons and Dow Chemical's massive Freeport works.

The advisory will remain in place until the authority's water system has been thoroughly flushed and tests on water samples show the system's water is again safe to use. The authority said in a statement that it was unclear how long it would be before the tap water was again safe.

The authority's water source is the Brazos River.

According to a press release issued by Lake Jackson on Saturday, the city first became aware of the amoeba after it infected a six-year-old boy. "On September 8th, 2020, the City of Lake Jackson was contacted by the Brazoria County Health Department about a 6-year-old boy that was hospitalized due to a rare and often fatal brain eating amoeba, *Naegleria Fowleri*," the statement said. "After his diagnosis, the family had indicated two possible water sources where he could have been exposed to the amoeba; one being the Lake Jackson Civic Center Splash Pad and the other being a hose at his home."

The city subsequently tested both potential sources, as well as others. Initial test results came back negative for *Naegleria Fowleri*, but later three out of eleven samples given to the Centers for Disease Control and Prevention for preliminary testing came back positive.

The three positive results came from water taken from the splash pad storage tank, the boy's home hose bib, and a "dead end fire hydrant in downtown." The three samples were the only ones taken by the "filtration collection method," which requires a larger quantity of water to run, according to the city.

Naegleria fowleri is a free-living microscopic amoeba, or single-celled living organism commonly found in warm freshwater and soil, according to the CDC. It usually infects people when contaminated water enters the body through the nose, from where it travels to the brain and can cause a rare and debilitating disease called primary amebic meningoencephalitis.

The infection is usually fatal and typically occurs when people go swimming or diving in warm freshwater places such as lakes and rivers. In very rare instances, *naegleria* infections may also occur when contaminated water from other sources (such as inadequately chlorinated swimming pool water or heated and contaminated tap water) enters the nose.

Chlorine was detected in all three positive samples found in Lake Jackson.

According to the CDC, between 2009 and 2018, there were 34 infections reported in the U.S. In a majority of the cases, people were infected in recreational water, while three were infected after performing nasal irrigation using contaminated tap water. One person was infected by contaminated tap water used on a backyard slip-n-slide.

Earlier this month, the family of a teen boy said he died from a brain-eating amoeba after vacationing at a North Florida campground in August.

Researchers Have Pioneered A Technique To Purify Water By Using The Power Of Sunlight

Scott Snowden

Sep 28, 2020,03:26pm EDT

<https://www.forbes.com/sites/scottsnowden/2020/09/28/researchers-have-pioneered-a-technique-to-purify-water-by-using-the-power-of-sunlight/#706954cc5433>

Scientists in Australia have been able to transform brackish water and seawater into safe, clean drinking water in less than 30 minutes using metal-organic frameworks (MOFs) and sunlight.

In a discovery that could provide potable water for millions of people across the world, researchers were not only able to filter harmful particles from water and generate 139.5L of clean water per kilogram of MOF per day, but also perform this task in a more energy-efficient manner than current desalination practices.

Metal-organic frameworks are a class of compounds consisting of metal ions that form a crystalline material with the largest surface area of any material known. In fact, MOFs are so porous that they can fit the entire surface of a football field in a teaspoon.

The World Health Organization suggests good quality drinking water should have a total dissolved solid (TDS) of less than 600 parts per million (ppm). The team of researchers were able to achieve a TDS of less than 500 ppm in just 30 minutes and regenerate the MOF for reuse in four minutes under sunlight.

Lead author Professor Huanting Wang from the Department of Chemical Engineering at Monash University in Melbourne, said this work – which was published in the journal *Nature Sustainability* – opened up a new direction for designing stimuli-responsive materials for energy-efficient and sustainable desalination and water purification.

“Desalination has been used to address escalating water shortages globally. Due to the availability of brackish water and seawater, and because desalination processes are reliable, treated water can be integrated within existing aquatic systems with minimal health risks,” Professor Wang said.

“But, thermal desalination processes by evaporation are energy-intensive, and other technologies, such as reverse osmosis, has a number of drawbacks, including high energy consumption and chemical usage in membrane cleaning and dechlorination.

“Sunlight is the most abundant and renewable source of energy on Earth. Our development of a new adsorbent-based desalination process through the use of sunlight for regeneration provides an energy-efficient and environmentally-sustainable solution for desalination.”

More than 780 million people worldwide lack even a basic drinking-water service and by 2025, half of the world’s population will be living in water-stressed areas. The population itself is set to hit 10 billion by 2050 and a staggering *10.9 billion* by 2100, according to a UN report. And on top of that, global warming caused by humanity since the industrial revolution has been found to be without parallel in the past two thousand years.

Between 2017 and 2018, South Africa suffered a severe water shortage in the Western Cape region, most notably affecting the City of Cape Town when water levels hovered between 15 and 30 percent of total dam capacity. Significant water restrictions were implemented in a bid to curb water usage, which was successfully reduced by more than half to around 500 million liters (130,000,000 US gal) per day in March 2018 before conditions began to slowly improve.

But it was unquestionably a sign of what will happen again in the not too distant future.

How a toxic chromium species could form in drinking water

by American Chemical Society

SEPTEMBER 30, 2020

<https://phys.org/news/2020-09-toxic-chromium-species.html>

The water crisis in Flint, Michigan, brought much-needed attention to the problem of potentially toxic metals being released from drinking water distribution pipes when water chemistry changes. Now, researchers reporting in ACS' *Environmental Science & Technology* have investigated how hexavalent chromium, known as Cr(VI), can form in drinking water when corroded cast iron pipes interact with residual disinfectant. Their findings could suggest new strategies to control Cr(VI) formation in the water supply.

The metal chromium, known as Cr(0), is found in cast iron alloy, which is the most widely used plumbing material in water distribution systems. As pipes corrode, a buildup of deposits, known as scale, forms on the pipes' inner walls. Trace chemicals in water can react with scale, forming new compounds that could be released into the water. Some of these compounds contain Cr(VI), which, at high doses, can cause lung cancer, liver damage, reproductive issues and developmental problems. In 2014, California set a drinking water standard of 10 $\mu\text{g/L}$ Cr(VI), but the guideline was later withdrawn because no economically feasible treatment to remove Cr(VI) from tap water existed. Haizhou Liu and colleagues wanted to find out how exactly Cr(VI) makes its way into drinking water, which might reveal new ways to prevent its formation.

The researchers collected two sections of cast iron pipe from two drinking water distribution systems in the U.S.: one from a system using groundwater with naturally high Cr(VI) levels (11-24 $\mu\text{g/L}$), and the other from a system using surface water with undetectable Cr(VI). The team scraped off scale from the pipes and analyzed its composition. The levels of total Cr were about 18 times higher in the first pipe than in the second. In both pipes, chromium existed in two oxidation states, Cr(0) and Cr(III). When the researchers added a chlorine- or bromine-containing disinfectant to the scale, it quickly reacted with Cr(0), rather than Cr(III) as previously suspected, to form Cr(VI). To help mitigate Cr(VI) levels, adding less-reactive disinfectants to treat drinking water could be explored, and cast iron pipes with chromium alloy should be used with caution, the researchers say.

Letter: Vote yes on Amendment D to secure your water rights

By Readers' Forum Oct 1, 2020, 10:00am MDT

By Brian Zehnder

<https://www.deseret.com/opinion/2020/10/1/21494167/letter-vote-yes-on-amendment-d-to-secure-your-water-rights>

Imagine a drought in Utah like the one that lasted 288 weeks 2001-2006. Imagine having your water turned off with a 30-day notice. Imagine your home value plummeting because you have no permanent water rights.

Hard to believe? It's all true.

If you are a resident in Millcreek, Holladay or Cottonwood Heights, you likely get your water from Salt Lake City through a "surplus water contract." This means they choose to sell water in a different city, if there is a "surplus."

Like me, you may be cringing now. "Surplus" and "water" are two words that really don't go together in arid Utah.

The history is complicated, mostly because of the growth along the Wasatch Front. Salt Lake City maintains the water infrastructure and holds most of the water for the east bench. As a resident of Holladay, I am thankful for this water. In the end, however, if I have a water "issue," I can't get very far with the Holladay mayor about quality or cost. I would need to take it up with "big brother."

HB31, passed by the State Legislature, and Constitutional Amendment D, basically fixes that. If the amendment passes, the bill takes effect, and your water rights become permanent. Your water may not be shut off. You also have a say in future water rate changes.

Seems like a "no brainer." But in an era when people often vote "no" for things they don't understand, a failed amendment could put billions of property value at risk in Salt Lake County and across the state.

Vote yes for Constitutional Amendment D on Nov. 3.

Brian Zehnder

Holladay

Mt. Pleasant gets USDA funding for new treatment plant

By Rhett Wilkinson Staff writer

10-1-2020

<http://sanpetemessenger.com/archives/19626>

MT. PLEASANT—The Trump administration announced on Friday that the United States Department of Agriculture is investing \$5.2 million—\$4.22 million loan and \$980,000 in grant money—to modernize rural drinking water and wastewater infrastructure in Mt. Pleasant.

What did Mt. Pleasant Mayor Michael Olsen think about that?

“If we got just a little more grant, then it would have been nicer,” Olsen said.

The city will have to increase the cost of water to pay off the loan, Olsen said. The loan is 81.2 percent of the USDA’s investment.

Olsen spoke further to the investment.

“[We’re] glad we can get it so we can get this going—so we can move forward with getting more water,” Olsen said.

Mt. Pleasant is receiving the loan and grant to build a culinary water treatment plant. Olsen said that the city is, “Trying to get [its] water project going.”

The loan and grant will also help the city add transmission piping and drill an additional well to ensure successful, reliable water distribution and treatment.

“Upgrading a city’s infrastructure has lasting effects on economic development, public health, and meeting the critical need for housing growth, which all fit in USDA’s mission of rural prosperity,” said Randy Parker, Utah State Director for USDA Rural Development. “Under the leadership of President Trump and Agriculture Secretary Perdue, USDA has been working tirelessly to be a strong partner to rural Utah in building stronger and healthier communities.”

USDA funded Mt. Pleasant’s project through the Water and Waste Disposal Loan and Grant Program.

Mt. Pleasant’s population was 3,488 as of 2018, according to sources including the United States Census Bureau.

After Wildfires Stop Burning, a Danger in the Drinking Water

Experts are warning that existing water safety rules are not suitable to a world where wildfires destroy more residential areas than in the past.

By Max Horberry

Published Oct. 2, 2020 Updated Oct. 5, 2020

<https://www.nytimes.com/2020/10/02/science/wildfires-water-toxic.html>

Two months after a wildfire burned through Paradise, Calif., in 2018, Kevin Phillips, then a manager for town's irrigation district, walked from one destroyed home to another.

Burned out cars, the occasional chimney and the melted skeletons of washers and dryers were the only recognizable shapes.

"You started to actually be shocked when you saw a standing structure," he said.

Mr. Phillips, now Paradise's town manager, was following the team taking samples from intact water meters connected to homes that were now reduced to gray ash. He knew from the Tubbs Fire in 2017 that toxic chemicals were likely in the water distribution system: Rapid action would be needed to protect people returning to the community from the dangers of substances like benzene, which can cause nausea and vomiting in the short-term, or even cancer over time.

Wildfires, which turned skies a dim orange over cities from Seattle to Santa Cruz this year, are increasingly engulfing people's homes, continuing to rage in California, Oregon, Washington and Colorado in recent weeks. But even when homes don't burn, other dangers arise in the aftermath, and experts are focusing more attention on what happens to municipal water systems after a fire, when released toxic chemicals can get pulled into plumbing systems, and other damage can linger in pipes for years.

After the fire that destroyed Paradise, for example, tests reported in a new study showed benzene levels in drinking water at 2,217 parts per billion. The Tubbs Fire led to levels as high as 40,000 parts per billion. California health authorities say 1 part per billion is dangerous over the long-term, and 26 parts per billion is dangerous for short-term exposure. And many other compounds that end up in water after fire can also create health risks.

"It's hard enough having the pandemic restrictions," said Angela Aurelia, a resident of Boulder Creek in Santa Cruz County, whose home was partially damaged in August. "And then you have a wildfire, and you lose access to your home and then we can't even go back home because the water isn't likely safe to use."

Mr. Phillips and some others who work to ensure the water flowing into homes is safe say they are following guidelines that are not designed for this kind of disaster.

After a fire, water in houses and in the underlying pipes “can become contaminated with an array of volatile organic compounds and semi-volatile organic compounds” at levels that exceed the regulatory limits set by the state of California as well as the federal Environmental Protection Agency, said Amisha Shah, a water quality engineer at Purdue University. “It’s very clear it needs to be addressed.”

Volatile organic compounds, such as benzene, naphthalene and methylene chloride, have a low boiling point and can be dispersed into the air easily. Semi-volatiles, including chrysene and benzo(b)fluoranthene, have a higher boiling point but can be dispersed during, for example, a warm shower. Although not all of these compounds are harmful, some have been found to cause cancer in the long term.

Dr. Shah was a co-author of the study published in July by AWWA Water Science that summarized the lessons from the past few years. Analyzing sample data from the Tubbs Fire as well as the Camp Fire that destroyed Paradise, the researchers found some of those harmful chemicals caused by wildfires throughout the distribution system. Earlier concern had focused on ash runoff making its way into water sources, like reservoirs.

The researchers’ observations lined up with Mr. Phillips’s experience in Paradise two years ago.

“Over 50 percent of those service lines from burned structures had some detection of contamination,” he said.

But he noticed there was a randomness to it. Water in one house would be contaminated, while the neighboring system would be clear.

The state’s regulations appeared inadequate to deal with a post-wildfire scenario, forcing Mr. Phillips and his team to effectively improvise their own standards.

“We did go over and above what maybe the Water Board would’ve required us to do,” he said.

Had they not, he said, it might have taken years if not decades, to have clean drinking water again in the town.

How water moves through distribution systems, especially during a wildfire, is complex and needs more study. But Dr. Shah and the other authors of the research say that a loss in pressure, which occurs when fires damage pipes, turns the plumbing into a vacuum that sucks smoke and other toxic chemicals out of burning homes. Those substances then get circulated throughout a community’s water distribution system. It can even become worse, for example, when firefighters use a nearby hydrant, a necessary step that effectively encourages circulation.

In addition to toxic substances becoming more widely dispersed from those charred buildings, plastic piping common in California's mountainous areas releases chemicals when heated, melted or burned. The study's authors said such piping, even if it was not damaged, could absorb harmful chemicals passing through them that would leach into the water over a long period of time.

In San Lorenzo Valley, for example, 7.5 miles of high-density polyethylene pipes burned and were destroyed on Aug. 21. The over-ground pipes, which wound through a steep, heavily wooded mountain in Santa Cruz County, supplied water to more than 21,000 residents.

During the chaotic aftermath of a wildfire's destruction, members of water districts can feel overwhelmed and confused about the best course toward ruling a system safe to use again. While many local water districts and other water utilities test for volatiles, most are not looking for semi-volatiles.

In the case of the San Lorenzo Valley pipes, for instance, regulators have been told to test only for the 80 or so compounds in the E.P.A.'s volatile organic compounds screening, despite evidence that burning plastic pipes release some semi-volatiles, too.

Advice for residents has also been inconsistent. While the state recommends "do not use" orders when there is "an unknown contaminant," most utilities are being told to issue "do not drink, do not boil" orders to prevent ingestion. But scientists worry that even taking a shower or washing may not be safe if the water has high levels of the compounds. Some toxic chemicals can be inhaled when the water is aerosolized.

Rick Rogers, the district manager at San Lorenzo Valley Water District, said it was "following the state regulation to the letter." They issued a "do not drink, do not boil" order but have not been told to issue a "do not use" order.

The district's advisory issued on Aug. 29 told residents that they could shower, but should "limit shower time" and "ventilate the area well." It also recommended that "the safest option is to use alternative water for showers." In public meetings, residents expressed confusion over the orders. Subsequent tests have found benzene in the valley's water supply.

Since 2014, the state of California put the responsibility for water safety in the hands of the State Water Resources Control Board.

The regulations in place for local water utilities are designed for normal day-to-day activity. The board's recommended tests are aimed at finding routine contaminants. Because there is no rule book for a wildfire disaster, the regulations do not take into account all of the toxic substances that scientists are now recognizing as wildfire fallout.

In some cases, the state board has recommended tests that only look for benzene, which they consider to be a major flag for other contaminants.

“Benzene has been the leading indicator of contamination in every case where there have been combustion products that have gotten into the water system,” said Stefan Cajina, of the board’s division of drinking water.

He added that testing for semi volatile contaminants could be useful, “but in our experience they’re not likely to be there unless benzene is also present.”

Many scientists disagree with this assumption, and the data that Dr. Shah and her colleagues studied showed carcinogenic semi-volatiles when there was no benzene present.

“There’s enough information to be cautious,” said Fernando Rosario-Ortiz, director of environmental engineering at the University of Colorado, Boulder, who was not involved in the study. “It’s definitely teaching water utilities that if you go through a case like Santa Rosa did, and the Paradise fire, that under those criteria you should definitely do some additional testing.”

Prioritizing time and efficiency during an emergency, the state is advising water utilities to test for the substances that are most likely to be found. Mr. Cajina said testing for other chemicals, like the semi-volatiles, might take more time and cost more.

“That type of testing might be more appropriate for long-term study than for immediate active fire response,” he said.

But as Dr. Shah and colleagues report in their study that when fires burn homes and pipes, other potentially harmful chemicals have also been found later on. If contamination is not contained, it can quickly spread throughout the system.

“Time is of the essence in not allowing residential units, or any location where they would want to use water, to open up the tap and then expose themselves,” she said.

Part of the problem is a lack of clear authority during a state of emergency, with the authority for water remaining spread out over various federal and state agencies.

“There is no water specific mission in the national response framework,” said Kevin Morley, manager of federal relations at the American Water Works Association. With so many departments overseeing water during an emergency, it becomes difficult to ascertain clear authority, direction and support.

Other states are now looking to California’s guidelines and regulations to inform how they tackle their wildfire water safety. An Oregon agency last month issued a guide for testing for volatile organic compounds that seems to replicate California’s recommendations, copying some of the problems that scientists have warned about.

As wildfires worsen and grow increasingly common, experts like Dr. Shah are calling for clear federal or state guidelines that local water utilities can follow.

They recommend testing for a wide range of compounds, throughout entire water systems, and the need to issue “do not use” orders for residential water until results are available. Pre-emptive measures, like installing one-way valves at home water meters and shutting off water systems ahead of a fire’s encroaching threat, could isolate contamination. San Lorenzo Valley Water District shut down part of its system, for example, which might have helped avoid some spread.

Mr. Phillips said that as wildfire dangers persisted, states and towns needed to be more “prepared for the unknown.

“You have to put the worst-case scenario into a stress test and then build a response around that.”

Ogden City looking to replace outdated water meters, improve accuracy of readings

By MITCH SHAW Standard-Examiner

Oct 8, 2020

https://www.standard.net/news/local/ogden-city-looking-to-replace-outdated-water-meters-improve-accuracy-of-readings/article_87e2ee28-e3f2-5764-92ce-786ca92796d4.html

OGDEN — Ogden City is proposing a new, \$1 million capital improvement measure that would replace outdated residential water meters across the city, which, theoretically, could increase the amount city residents pay for their water.

The city administration wants to City Council to vote to amend Ogden’s 2021-2025 Capital Improvement Plan to include a project to replace old water meters with new ones that can be read remotely.

Ogden Public Utilities Manager Brady Herd said Ogden’s water metering system is one of the largest in Utah and includes more than 24,000 individual meters. The proposed replacement program, he said, is intended to improve meter reading efficiency, accuracy and access to water information for residents. If the plan is approved, outdated water meters throughout the city will be replaced sometime during the next year.

Ogden City Engineer Justin Anderson said most of the city’s older meters likely don’t give a true account of the actual amount of water being used by residents.

“When meters get so old, they quit reading properly,” Anderson said. “That’s another reason to get them replaced, because they under read the actual water usage.”

With regular droughts and surging development that continues to put pressure on supplies, water has been an ongoing issue along the Wasatch Front for years, but the matter is compounded in Ogden and there’s one key factor complicating things. According to city council documents, just under 50% of city residents have access to secondary water, meaning many are required to use culinary water for their outdoor watering needs.

Secondary water rates throughout the city vary depending on the provider, but even with those variations, it’s generally much less expensive to irrigate a yard with secondary water than it is with culinary water. Ogden City’s water rates are based on meter size, water usage and access to secondary water.

The city also has long had an ordinance on the books governing the condition of residents’ lawns. The city’s code on landscaping (section 15-13-16) says “all plantings shall be maintained

in a healthy and attractive condition (and) ... shall be adequately watered to maintain a healthy condition as by the typical color of the plant under normal growing conditions.”

But Ogden Chief Administrative Officer Mark Johnson previously told the Standard-Examiner the city has been using a relaxed interpretation of the code, particularly during dry years. It’s also important to note though, that the city doesn’t technically require homeowners to even have a lawn.

Landscaping rocks, gravel, mulches, artificial turf or wood chips can be used as ground cover without city approval as long as those materials don’t cover more than 10% of the ground area. Residents can exceed the 10% threshold, so long as the design is approved by the city planning staff. The planning staff uses a large set of criteria when making determinations.

Ogden Council Policy Analyst Amy Maybe said the council will likely hold a public hearing on the meter replacement proposal on Nov. 10.

Rainfall remains elusive in Utah with many areas in severe drought as water year ends

Officials: 'We desperately need replenishing snow this winter!'

/ October 08, 2020

<https://www.moabtimes.com/articles/rainfall-remains-elusive-in-utah-with-many-areas-in-severe-drought-as-water-year-ends/>

While the State of Utah as a whole is “abnormally dry,” precipitation in southeast Utah was below average at 37%, which brings the seasonal accumulation (October-September) to 77% of average. Soil moisture is at 19% compared to 15% last year. Reservoir storage is at 19% of capacity, compared to 77% last year. The water availability index for Moab is 24%, according to the service.

The analysts who prepare the report said it has been reorganized to better reflect two distinct geographic areas being monitored — the low elevation valley sites (Soil Climate Analysis Network) that are critical for agricultural production and operations, and the high elevation mountainous areas where water supply is generated (SNOWTElemetry).

Current Valley Conditions

Utah’s valley locations ended the 2020 water year with an average of 7.7 inches of precipitation. While this is low, it doesn’t tell the whole story; almost 70% of this precipitation accumulated during the first half of the water year, said the summary.

“Like last summer, there just wasn’t any monsoonal moisture during the growing season. The exceptional dryness during the growing season is reflected in current drought conditions and the extended fire season. Last year at this time, only 54% of Utah was designated in any category of drought. Now 100% of the state is abnormally dry or worse. More troubling is that conditions in 13% of the state are currently designated as exceptional drought.”

Soil moisture levels are very low at just 26% of saturation compared to 28% last year. Although dry conditions are likely to persist into the near future, officials hope that October will bring a big pattern change and the start of storms more characteristic of winter.

Current Mountain Conditions

The 2020 water year drew to a close at the end of September. The water year precipitation ended at 76% of average, but as noted above, most of that moisture was received months ago. The late

spring and summer seasons provided far below average precipitation, including only 30% of normal for the month of September.

Statewide soil moisture is hovering close to record lows for the observed period, and reservoir storage is at 62% of capacity compared to 74% last year. Water Availability Indices (WAI) are all below normal except for the Bear River basin and its sub-watersheds.

Several basins in Utah have exceptionally low WAI values, including the Blacks Fork, Smiths Creek, San Pitch, Eastern Uintas and Lower Sevier. “We desperately need replenishing snow this winter,” said a statement in the report.

Also, SNOTEL sites are situated in mountain environments in order to measure the snowpack’s water content and predict spring runoff, which unfortunately also means that they tend to be vulnerable to wildfires and other natural phenomena. September saw two of Utah’s SNOTEL sites go down. First, the Parrish Creek site fell prey to a massive windstorm event that impacted the Wasatch Front. Located above Centerville near Skyline Drive, the winds toppled an extraordinary number of trees around the site, including several that landed on the snow pillow and knocked the snow depth sensor arm sideways.

The snow survey crew plans to rebuild this site by mid-October. More recently, the Brown Duck SNOTEL site (south slope of the Uintas, northwest of Mountain Home) partially burned down. As of Oct. 1, fires in that area were still active, so rebuilding the site will need to wait until conditions are safe.

“We are hopeful that the weather will hold. If so, the snow Survey staff will bring in a new shelter and repair the electronics in late October. However, this is a high elevation site so it’s possible that early snow will block passage until next summer,” said the report.

“These impacted sites aside, the Utah Snow Survey has been able to manage near-normal field operations this summer despite everything that 2020 has thrown at us.”

Study: More Than 200 Million Americans Could Have Toxic PFAS in Their Drinking Water

Monica Amarelo

WEDNESDAY, OCTOBER 14, 2020

<https://www.ewg.org/release/study-more-200-million-americans-could-have-toxic-pfas-their-drinking-water>

WASHINGTON – A peer-reviewed study by scientists at the Environmental Working Group estimates that more than 200 million Americans could have the toxic fluorinated chemicals known as PFAS in their drinking water at a concentration of 1 part per trillion, or ppt, or higher. Independent scientific studies have recommended a safe level for PFAS in drinking water of 1 ppt, a standard that is **endorsed by EWG**.

The **study**, published today in the journal Environmental Science & Technology Letters, analyzed publicly accessible drinking water testing results from the Environmental Protection Agency and U.S. Geological Survey, as well as state testing by Colorado, Kentucky, Michigan, New Hampshire, New Jersey, North Carolina and Rhode Island.

“We know drinking water is a major source of exposure of these toxic chemicals,” said Olga Naidenko, Ph.D., vice president for science investigations at EWG and a co-author of the new study. “This new paper shows that PFAS pollution is affecting even more Americans than we previously estimated. PFAS are likely detectable in all major water supplies in the U.S., almost certainly in all that use surface water.”

The analysis also included laboratory tests commissioned by EWG that **found** PFAS chemicals in the drinking water of dozens of U.S. cities. Some of the highest PFAS levels detected were in samples from major metropolitan areas, including Miami, Philadelphia, New Orleans and the northern New Jersey suburbs of New York City.

There is no national requirement for ongoing testing and no national drinking water standard for any PFAS in drinking water. The EPA has issued an inadequate **lifetime health advisory level** of 70 ppt for the two most notorious fluorinated chemicals, PFOA and PFOS, and efforts to set an enforceable standard could take many years.

In the absence of a federal standard, states have started to pass their own legal limits for some PFAS. New Jersey was the first to issue a maximum contaminant limit for the compound PFNA, at 13 ppt, and has set standards of 13 ppt for PFOS and 14 ppt for PFOA. Many states have either

set or proposed limits for PFOA and PFOS, including California, Massachusetts, Michigan, New Hampshire, New Jersey, New York and Vermont.

“The first step in fighting any contamination crisis is to turn off the tap,” said Scott Faber, EWG senior vice president for government affairs. “The second step is to set a drinking water standard, and the third is to clean up legacy pollution. The PFAS Action Act passed by the House would address all three steps by setting deadlines for limiting industrial PFAS releases, setting a two-year deadline for a drinking water standard, and designating PFAS as ‘hazardous substances’ under the Superfund law. But Mitch McConnell’s Senate has refused to act to protect our communities from ‘forever chemicals.’”

PFAS are called forever chemicals because they are among the most persistent toxic compounds in existence, contaminating everything from drinking water to food, food packaging and personal care products. They are found in the blood of virtually everyone on Earth, **including newborn babies**. They never break down in the environment.

Very low doses of PFAS chemicals in drinking water have been linked to **suppression of the immune system** and are associated with an elevated risk of cancer and **reproductive and developmental harms**, among **other serious health concerns**.

“When we look for PFAS contamination, we almost always find it,” said **David Andrews**, Ph.D., a senior scientist at EWG and one of the co-authors. “Americans should trust that their water is safe, but far too many communities have water supplies polluted by toxic PFAS chemicals. These are some of the most insidious chemicals ever produced, and they continue to be used. Our analysis was largely limited to PFOA and PFOS, but many more PFAS are found to contaminate drinking water and the **entire class of PFAS chemicals is a concern**.”

The EPA has identified over 600 PFAS in active use in the U.S. According to the most **recent analysis of state and federal data by EWG**, 2,230 locations in 49 states are known to have PFAS contamination, including more than **300 military installations**.

PFAS contamination has raised alarms among **a bipartisan group of lawmakers in Congress**. The PFAS Action Act also includes a provision that would set a two-year deadline for the EPA to establish a national drinking water standard for the two most notorious PFAS chemicals – PFOA, formerly used to make DuPont’s Teflon, and PFOS, formerly an ingredient in 3M’s Scotchgard.

The House versions of the **National Defense Authorization Act** and **EPA spending bill** also include important PFAS reforms.

“It’s not too late for this Congress to protect us from the growing PFAS contamination crisis,” Faber said.

Fears of Legionella in Drinking Water Grow Amid Pandemic

The bacteria is sickening and sometimes killing Americans, with the reopening of buildings prompting fresh concerns

By Lynne Peeples

October 14, 2020

<https://www.consumerreports.org/water-quality/fears-of-legionella-in-drinking-water-grow-amid-pandemic/>

Before her 73-year-old mom contracted Legionnaires' disease at a nursing home earlier this year, Monique Barlow knew little about the deadly pneumonia and the waterborne pathogen that causes it.

“Until then, I didn't give it much thought,” Barlow says. “I didn't even really know what it was.”

Sheryll Barlow, a resident of Room 325 at Arlington Court Skilled Nursing and Rehab Center in suburban Columbus, Ohio, died in late February. Arlington Court was just one of at least five Columbus-area facilities to report an outbreak of Legionnaires' disease, which is caused by Legionella bacteria, since May 2019.

Modern drinking water treatment in developed countries has effectively eliminated cholera, typhoid, and other traditional waterborne scourges. The Safe Drinking Water Act (SDWA), passed in 1974, propelled progress by requiring water suppliers to meet national standards for monitoring contaminants and managing them through filtration, disinfection, and other processes.

The U.S. now has one of the world's safest drinking water supplies. And most of the attention on drinking water safety today has shifted from microbiological to chemical, with plastics, pesticides, and per- and polyfluoroalkyl substances, or PFAS, leading lists of contaminants of concern.

Yet many microorganisms also slip through the cracks of U.S. drinking water systems, sickening up to an estimated 4 million to 32 million people every year. Although most result in only mild gastrointestinal upset, some can be deadly, as witnessed by recent reports of brain-eating amoeba in a Texas municipal water supply.

That figure doesn't include wells, which are particularly prone to pathogen problems. In 2000, some 2,300 people fell ill and seven died in Walkerton, Ontario, for example, after heavy

rainwater drew *E. coli* and *Campylobacter jejuni* bacteria from cow manure into a shallow aquifer of a nearby well.

Typical concentrations of chlorine used in treatment plants can be insufficient to kill off *Cryptosporidium* and *Giardia*, which cause gastrointestinal disease. And other infectious agents, including *Legionella* and nontuberculosis mycobacteria, reside beyond the reaches of the treatment plant, finding hospitable environments in the pipes that distribute water to and within hospitals, hotels, homes, and other buildings.

“It’s never going to be 100 percent, but we have things well under control for pathogens in source waters,” says Joe Cotruvo, PhD, an environmental and public health consultant based in Washington, D.C., and formerly with the Environmental Protection Agency’s Office of Drinking Water. “The data show that those risks are going down and have been going down ever since the Safe Drinking Water Act was implemented.”

That is, Cotruvo adds, with one exception. “What has been going up has been *Legionella*.” Figuring out why—and what do to about it—is a major focus of efforts to combat waterborne diseases today.

COVID-19 and *Legionella*

Attention to *Legionella* has been further heightened by the COVID-19 pandemic.

Some health experts express concern that a prior infection with the virus that causes COVID-19 could make a person more susceptible to *Legionella*. But there’s an even more pressing concern connecting the two: Building shutdowns through the spring and summer left warm water stagnant in pipes—a perfect environment for *Legionella* to multiply.

Many hotels, offices, schools, and other buildings have been left fully or partially vacant for long periods of time, notes Chris Edens, PhD, an epidemiologist with the Centers for Disease Control and Prevention, which recently released guidance for reopening buildings. “As those kinds of communities reopen, it’s important for owners and operators to be thinking about water management.”

Legionella grow naturally in the environment, especially warm freshwater lakes and streams that can be a source for drinking water. It generally becomes a risk to human health only when it enters and multiplies within human-made water and plumbing systems, and then that contaminated water becomes aerosolized.

Drinking fountains, hot tubs, sinks, toilets, sprinklers, showers, and air-conditioning systems are among the common sources. It tends to flourish when temperatures are warm, water is stagnant, chemical disinfectants are insufficient, and nutrients are plentiful, such as inside corroding pipes.

When inhaled at high enough levels, the bacteria can infiltrate the lungs and cause one of two forms of legionellosis: Pontiac fever and Legionnaires’ disease. The former is usually a

fairly mild respiratory illness; the latter is far more commonly reported and estimated to be fatal in 1 in 10 cases.

Now the leading cause of reported waterborne disease in the U.S., *Legionella* accounts for about 60 percent of outbreaks over the last decade. Almost 10,000 cases of legionellosis were reported to the CDC in 2018—the most ever in U.S. history, and still a likely underestimate. Edens suggests the true figure is probably double that. Other scientists estimate the annual case count at between 52,000 and 70,000.

A Proliferating Pathogen

Legionnaires' disease was discovered in 1976 after almost 200 people became ill with a mysterious type of pneumonia at an American Legion convention in Philadelphia. Dozens died. Health officials eventually identified a new bacterium that had thrived in the building's cooling towers and then spread through the air-conditioning system.

Cooling towers were also the source of more than 2,000 confirmed cases in New York City between 2006 and 2015. In the summer of 2019, the Sheraton Atlanta hotel was closed for a month after an estimated 79 people were infected from *Legionella* traced to the hotel's cooling tower and decorative fountain. The hotel chain said in a statement that it "took health and safety issues seriously," and worked closely with relevant authorities.

A variety of other plumbing problems and insufficient water management has resulted in outbreaks around the country—at nursing homes, hospitals, and schools, and across whole communities.

At least 87 people were infected with Legionnaires' disease in Flint, Mich., in 2014 and 2015 after the city switched water sources. Researchers found evidence for three likely sources of *Legionella* exposure: a hospital, city of Flint water, and local cooling towers. The mayor, Sheldon Neeley, told *Ensis* that the city is "making critically important infrastructure improvements to move our community forward in a positive direction."

Yet such large-scale Legionnaires' disease outbreaks are "just the tip of the iceberg," according to Joan Rose, PhD, a water researcher at Michigan State University in East Lansing. Research suggests that for every case linked to a specific source and outbreak there are nine sporadic cases. For example, outbreaks accounted for only about 10 percent of the cases in New York City linked to cooling towers.

"We don't have *Legionella* under control," Rose says.

Why does *Legionella* appear to be on the rise around the U.S.? The answer is complicated, says Edens at the CDC. The larger numbers could be partly due to greater awareness and testing. But he suggests that an aging population and aging infrastructure are major drivers.

“In large part, our distribution system is very antiquated,” says Amy Pruden, PhD, a professor of environmental and water resources engineering at Virginia Tech in Blacksburg. As water travels through the distribution system and enters a building, it can lose disinfectant as well as interact with the materials, temperatures, and design of the building’s plumbing. “Many things are at play that affect whether these microbes grow in the plumbing,” she adds.

Climate change, too, may be playing a role. Longer summers tax the cooling devices used by large buildings. More intense storms and flooding may increase the presence of Legionella in drinking water.

It has all added up to growing concerns and heightened calls to address the risks. “The thing about Legionella is it’s a silent killer,” says Eric Hageman, a personal injury lawyer in Minneapolis who represents the family of Sheryll Barlow in a claim against Arlington Court. “You can’t see it or smell it. It’s just in the air floating around. So you have to be proactive.”

Arlington Court had been aware of a Legionella problem at the facility months before Monique Barlow’s mom became sick after another resident contracted Legionnaires’ disease in October 2019. “I just assumed they took care of everything,” Barlow says. “But then it popped back up.”

After learning that her mom had contracted the disease, she says she wanted to know more. “I felt like they owed us an explanation. How are you fixing this? How is this not going to happen again?” Barlow says.

Since Feb. 10, Arlington Court has implemented changes, including the installation of filters in the kitchen, visitor areas, showers, bathrooms, and ice machines.

Arlington Court and its parent company, Vrable, did not respond to multiple requests for comment by Ensia.

In a letter to residents, reported on March 1 after local officials announced an investigation of an outbreak, Arlington Court said it took “very seriously the health and safety of everyone at the facility.” In a statement at the time, Vrable said it was working with authorities.

Controlling Contaminants

Edens at the CDC emphasizes water management strategies, such as flushing water pipes, controlling temperatures, and using disinfectant within a building. “We know water in the tap is not sterile,” he says. “The purpose of water management is to ensure that if some Legionella bacteria come through the main, the bacteria have nowhere to grow and hide.”

Adding chlorine or other disinfectants to water as it enters a building is yet another tactic to reduce contamination.

Consumers can also take steps to reduce risks in their own households. For example, the CDC recommends that hot tub or spa owners frequently test water for proper levels of chlorine,

bromine, and pH. “You need to consider the far reaches of the building,” says Cotruvo, the environmental and public health consultant. “If you’re not using a second bathroom, for example, then flush the shower before people use it.” Point-of-use water filters may also help control Legionella.

In an August 2019 report by the National Academy of Sciences, Engineering, and Medicine, a committee of 13 scientists warned that current federal, state, and local laws fail to protect the public from the spread of Legionella.

A handful of federal, state, and local regulations require certain buildings to have water management plans that include monitoring for and treatment of Legionella. But no federal law targets Legionella contamination of water supplies and building water systems.

The committee offered several recommendations for improving Legionella management in the U.S. Those include requiring a minimum disinfectant level throughout public water systems, developing clinical tools to capture more cases of Legionnaires’ disease, providing more guidance to homeowners, no longer allowing low-flow fixtures in hospitals and long-term-care facilities, addressing the longer periods of time that water sits idle, and lowering hot-water temperatures common in green buildings.

Many scientists argue a need for more urgent attention to and action on the issue.

“We need some coordination at the [federal] level,” says Pruden at Virginia Tech. “It’s a multistakeholder problem but is now awkwardly being handled through the litigation system.”

The Water Tap: How protecting endangered species protects our water source

Joan Meiners October 16, 2020

<https://www.thespectrum.com/story/news/2020/10/16/water-tap-protecting-endangered-species-protects-our-water-source/5905071002/>

Steve Meismer has an 800-pound gorilla on his back. But he hefts it for the benefit of the people of Washington County.

"The Endangered Species Act can be the 800-pound gorilla," the Local Coordinator of the Virgin River Program explained. "If the Wildlife Service says to a developer, 'Hey, you're taking too much water and the fish are dying,' guess what? The fish are going to get the water, it's going to be a long legal battle and nobody's gonna be happy. But if we work together to protect the environment and protect the species, that allows us to keep developing, keep using the water."

Meismer has a Master's degree in fisheries biology and has spent the last 20 years in Washington County working to help manage the Virgin River ecosystem. Sometimes this includes diverting water from our reservoir system because low flow or high temperatures indicate that the fish need it more.

But his efforts to help developers find solutions that meet federal requirements protecting sensitive species are not only on behalf of the six native fish species in the Virgin River, two of which are listed as endangered. He also works to protect fish for the sake of protecting our drinking water.

Meismer shares an office space and a close working relationship with the Washington County Water Conservancy District, in part because the river system he manages currently supplies a majority of the drinking water to the county's 180,000 residents. He works with WCWCD to make sure clean water keeps flowing to our taps by brokering the health of the Virgin River corridor.

His role also involves evaluating projects that affect the river with representatives from the eight other members, besides the WCWCD, of the Virgin River Program: the U.S. Fish and Wildlife Service, the State of Utah Department of Natural Resources, the National Park Service, the Bureau of Land Management, the Forest Service, the Nature Conservancy as well as the Dixie Conservation District and the Washington County Farm Bureau.

"I like to call myself the environment marriage counselor," Meismer said. "Because typically, I'm stuck between the Fish and Wildlife Service and cities or somebody else trying to do a

project and, 'How do we make it work for everyone so that we have the best possible outcome?' It's a matter of sitting down and working together."

The idea that fish need water might be a familiar one. But Meismer also champions the idea that water needs fish, and he works to make sure that the Virgin River keeps as many of its Woundfin (endangered), Virgin River Chub (endangered), Virgin Spinedace, Speckled Dace, Flannelmouth Sucker and Desert Sucker as possible.

(All six of these slippery, silvery species can be easily viewed by the public in a river window display that runs through a mock slot canyon in the free Red Hills Desert Garden near Pioneer Park.)

If it weren't for efforts to maintain the natural ecosystem of the Virgin River as a hospitable place for native fishes (the term for multiple fish species), the river corridor might become polluted and taken over by both competing fish species and tamarisk. Also called saltcedar, tamarisk is a highly invasive woody shrub that guzzles water and crowds out native plants to such a degree that it has been labeled throughout the west as a noxious weed by the National Park Service.

At the beginning of the Virgin River Program in 2000, when Meismer joined its ranks, tamarisk was winning the war for the river banks. This pervasive green weed with pinkish blooms can put down roots much deeper than native cottonwood trees or coyote willows, allowing it to spread up the bank and drain the river's flow from farther away. This is bad everyone who depends on that river's flow, fish and people included.

Armed with the mandate of that 800-pound gorilla, the Virgin River Program stepped in and removed tamarisk to clear the way for the endangered Woundfin and Virgin River Chub to thrive in local waters once again. This intervention also freed up more water to flow to Washington County taps, enabled the enforcement of measures to prevent pollution and damage to riverbanks from construction and protected existing developments from periodic flooding by restoring the river's natural ability to absorb occasional water surges.

"We've seen an amazing change from when I first got here," Meismer said. "The floods that we had in 2005 and 2010 woke people up to the power of the river. Before that it was just buried in a sea of tamarisk."

Meismer isn't alone in recognizing the importance of letting a river take its natural course. In his 2003 book, *Rivers for Life*, Brian Richter, a professor at the University of Virginia and the President of the education organization Sustainable Rivers, writes: "Rivers are more than conduits for water. They are complex systems that do complicated work. ... River systems include countless plant and animal species that together keep them healthy and functioning."

In an emailed discussion about how that principle applies to the Virgin River specifically, Richter elaborated that: "Using up all of the water in the Virgin River isn't just bad for fish, it's bad for everyone that relies on that river for water supply, recreation, aesthetic beauty, etc."

Recognition of this science is what drives the nine members of the Virgin River Program to keep coming back to the "environment marriage counselor" table to make sure that, while Washington County continues to grow at a faster rate than nearly any other community in the nation, we can accomplish that together without endangering the economy or our water supply, by following the guidelines set out to protect not only our endangered species, but us as well.

"People don't even typically recognize that we've got fish in here," said Meismer. "I think we as humans have a stewardship obligation to deal with them. And what we're really trying to do is protect the overall system of the Virgin River."