

# Water Fluoridation Webinar

January 23, 2025

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# Speakers



**Jill Woodlief, BSDH, RDH**  
Community Water Fluoridation Coordinator  
Virginia Department of Health



**Dr. Karen Shelton, MD**  
State Health Commissioner  
Virginia Department of Health



**Dr. McAllister Castelaz, DDS, MS**  
Clinical & Community Care Director,  
Virginia Health Catalyst



**Julie M. Floyd**  
Operator Certification & Training Manager  
Virginia Department of Health



**Jose Manuel Gonzalez**  
Application Development Specialist – Water  
Univar Solutions



**Matt Jacob**  
Communications Consultant  
Jacob Strategies



**Sarah Bedard Holland**  
CEO  
Virginia Health Catalyst



# Opening Remarks

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Jill Woodlief, BSDH, RDH  
Community Water Fluoridation Coordinator, VDH

# Welcome!

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Dr. Karen Shelton, MD  
State Health Commissioner, VDH

# Fluoridation Basics and Background

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Dr. McAllister Castelaz, DMD, MS

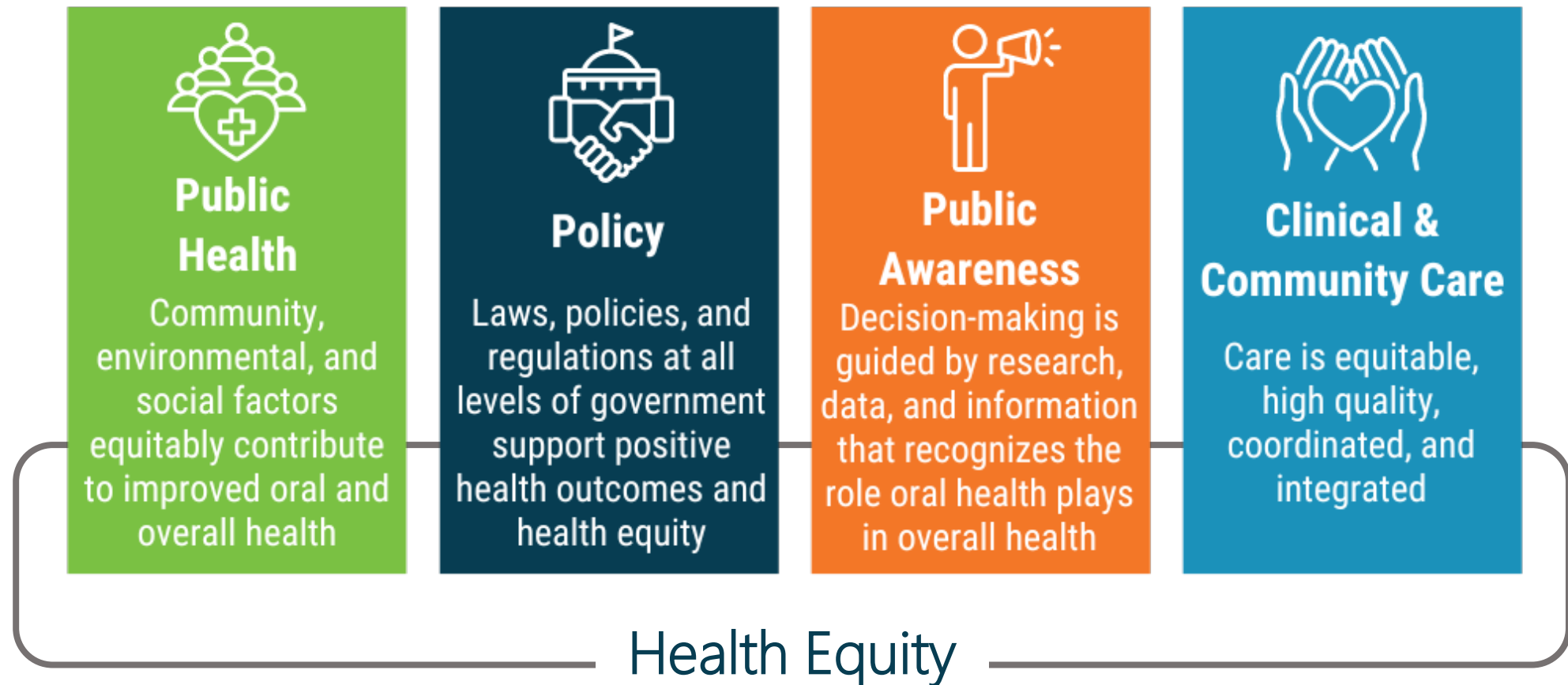
Director of Clinical and Community Care, Virginia Health Catalyst

Sarah Bedard Holland

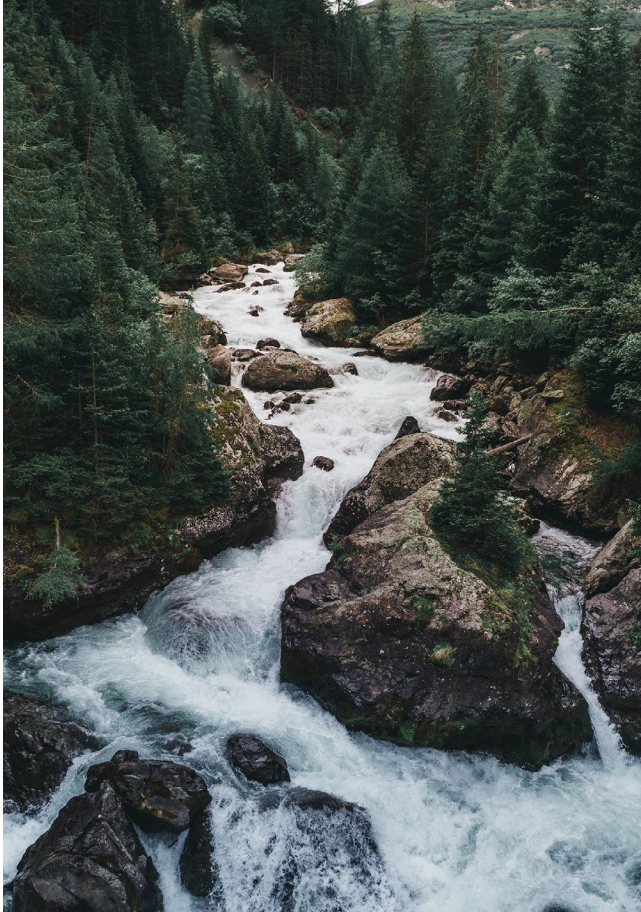
CEO, Virginia Health Catalyst

# Virginia Health Catalyst

Ensuring everyone in Virginia has equitable access to comprehensive health care that includes oral health.



# Fluoride Strengthens Teeth and Prevents Decay.



- Fluoride is a **naturally occurring mineral** found in lakes, rivers, groundwater, and soil
- Fluoride acts like a seatbelt for your teeth, providing constant protection
  - **Topical fluoride** (from toothpaste or treatments) strengthens teeth by repairing and fortifying enamel, making them more resistant to decay-causing acids
  - **Systemic fluoride** (from drinking water) is absorbed into your body, building strong teeth even before they emerge





# Community Water Fluoridation Revolutionized Oral Health.

- The benefits of fluoridated water was discovered in early 20<sup>th</sup> century where low cavity rates were noted in Colorado communities with naturally occurring fluoridated water
- **1945:** The first community water fluoridation (CWF) program began in Grand Rapids, MI
- Over 25 countries across the globe utilize CWF to improve oral health of their communities
- Today, the CDC identifies CWF as one of the “Ten Great Public Health Achievements of the 20<sup>th</sup> Century”





# Community Water Fluoridation Improves Oral Health and Saves Money.



- Reduces tooth decay by 25% across all age groups
- Decreases the need for costly dental procedures
  - Saves \$20-32 / people annually in dental treatment costs
  - For every \$1 spent, communities can see up to \$20 return on investment
- Provides equitable access to cavity prevention regardless of age, income, or education



# Decades of Research Confirms Fluoridation is Safe and Effective.

- Optimal level: 0.7 mg/L (also stated as 0.7 ppm)
- Higher levels of CWF (i.e., those exceeding 1.5 ppm such as in certain regions of China) can cause issues, but U.S. levels are well within the safe ranges
- Multiple professional, scientific organizations, including the Centers for Disease Control, The American Dental Association, the American Association of Pediatric Dentistry, and the American Pediatric Association, affirm that that CWF is a safe and vital public health practice



# Research Confirms Fluoridation is Safe and Effective.



- High-quality studies from countries including the United States, New Zealand, Australia, and Spain confirm fluoridation's safety
- Stopping fluoridation in cities like Calgary and Juneau led to increased cavities and higher dental treatment costs



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Thank you for your ongoing dedication to keeping our community water safe, healthy, and enriched with this evidence-based public health work.



# The Science of Fluoride in Water Systems

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Julie Floyd

Operator Certification & Training Manager, Virginia Department of Health

Jose Manuel Gonzalez

Application Development Specialist – Water, Univar Solutions





# Welcome

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## Fluoridation Chemistry

### Options, Safety and Handling





# Today's topics

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**Chemical Options for Fluoridation**  
**Fluoride Treatment Options Overview**  
**Safety Review**  
**Best Practices**





# Two Goals For Treating Water

**Safety and Simplicity**



## Dry fluoride sources

Sodium fluoride

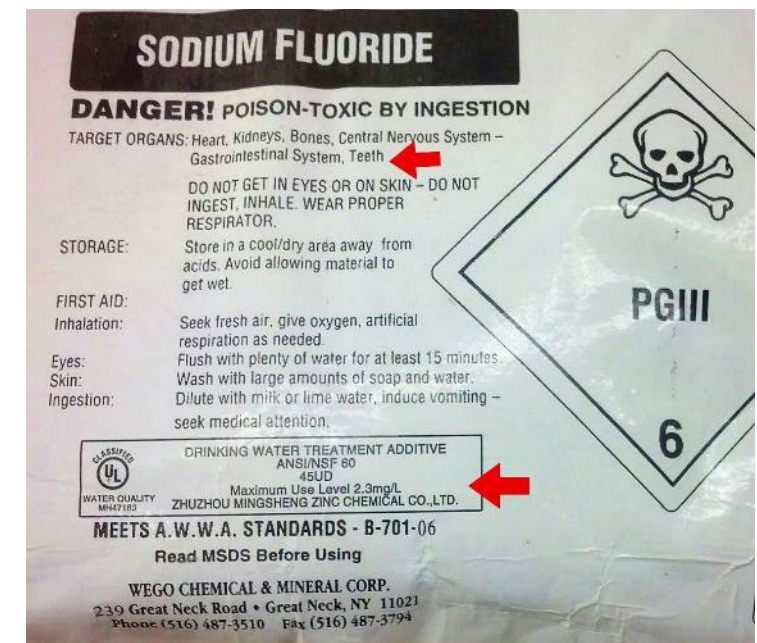
Sodium silicofluoride

## Liquid fluoride source

Hydrofluorosilicic acid

# Sodium fluoride – NaF

- Original fluoridation chemical
- No current US manufacturing
- GHS Label- Toxic (Ingestion, Inhalation)
- Absorbed through contact
- Requires appropriate PPE for solution make up
- Fed using a saturator



# Sodium silicofluoride or sodium fluorosilicate (SSF)

- Very limited US manufacturing
- GHS Label- Toxic (Ingestion, Inhalation)
- Absorbed through contact
- Requires PPE for making up solution
- Fed via saturator



# Hydrofluorosilicic acid (HFS)

- 23% solution
- Made in the USA
- GHS Label- Corrosive (contact)
- Not an RMP chemical
- Fed from bulk storage tank
- Minimal handling
- Fed using a metering pump



# Safety and Handling

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**SERIOUS  
ABOUT SAFETY**



# Options for mitigation

## Elimination or substitution

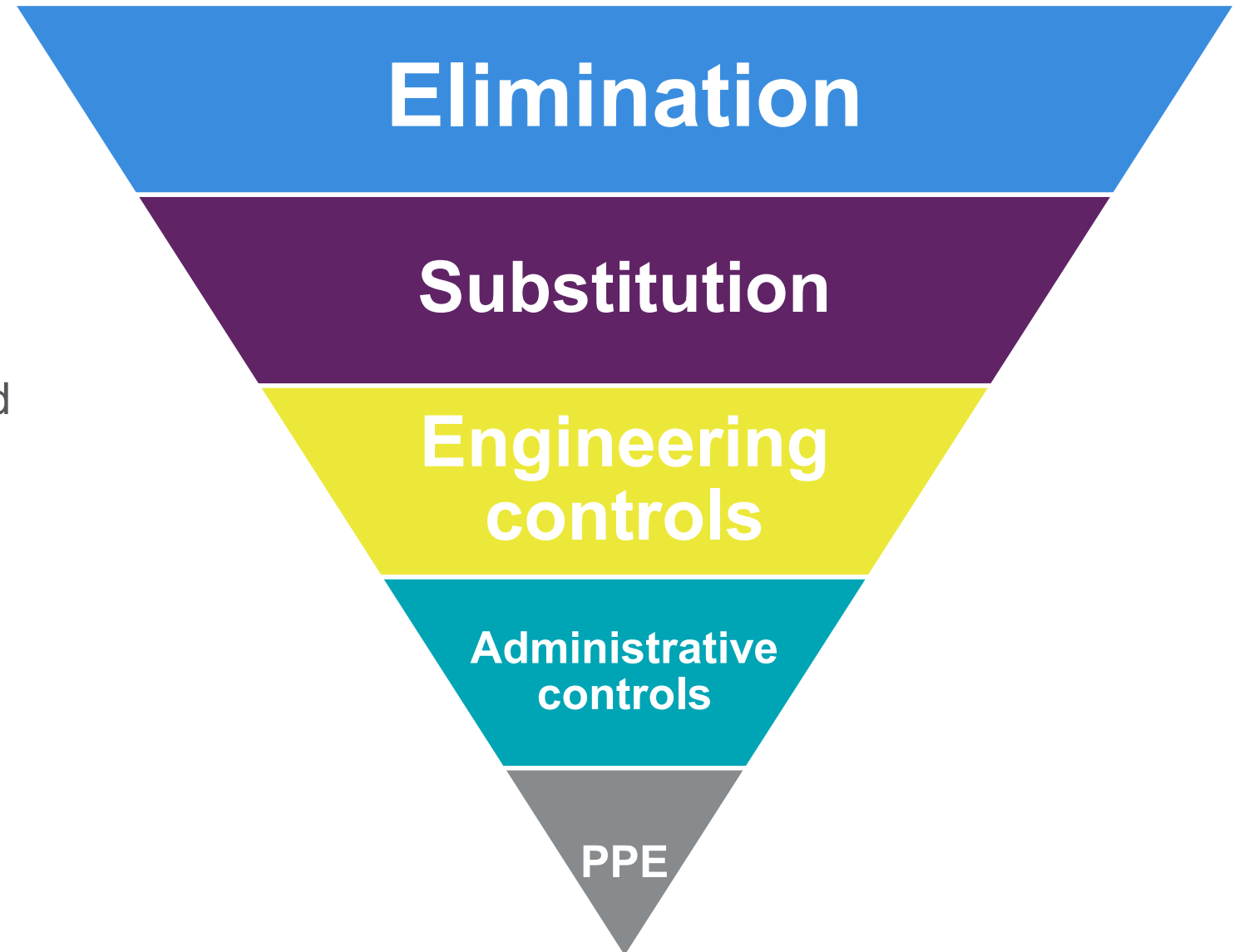
- Have to feed
- Chemical options

## Engineering controls

- Designed into the equipment/method
- Isolating hazards

## Personal barriers- Administrative/PPE

- Administrative- training, rules
- Hazard dependent
- Route of entry





# Safety case for liquid product feeds

## Elimination or substitution

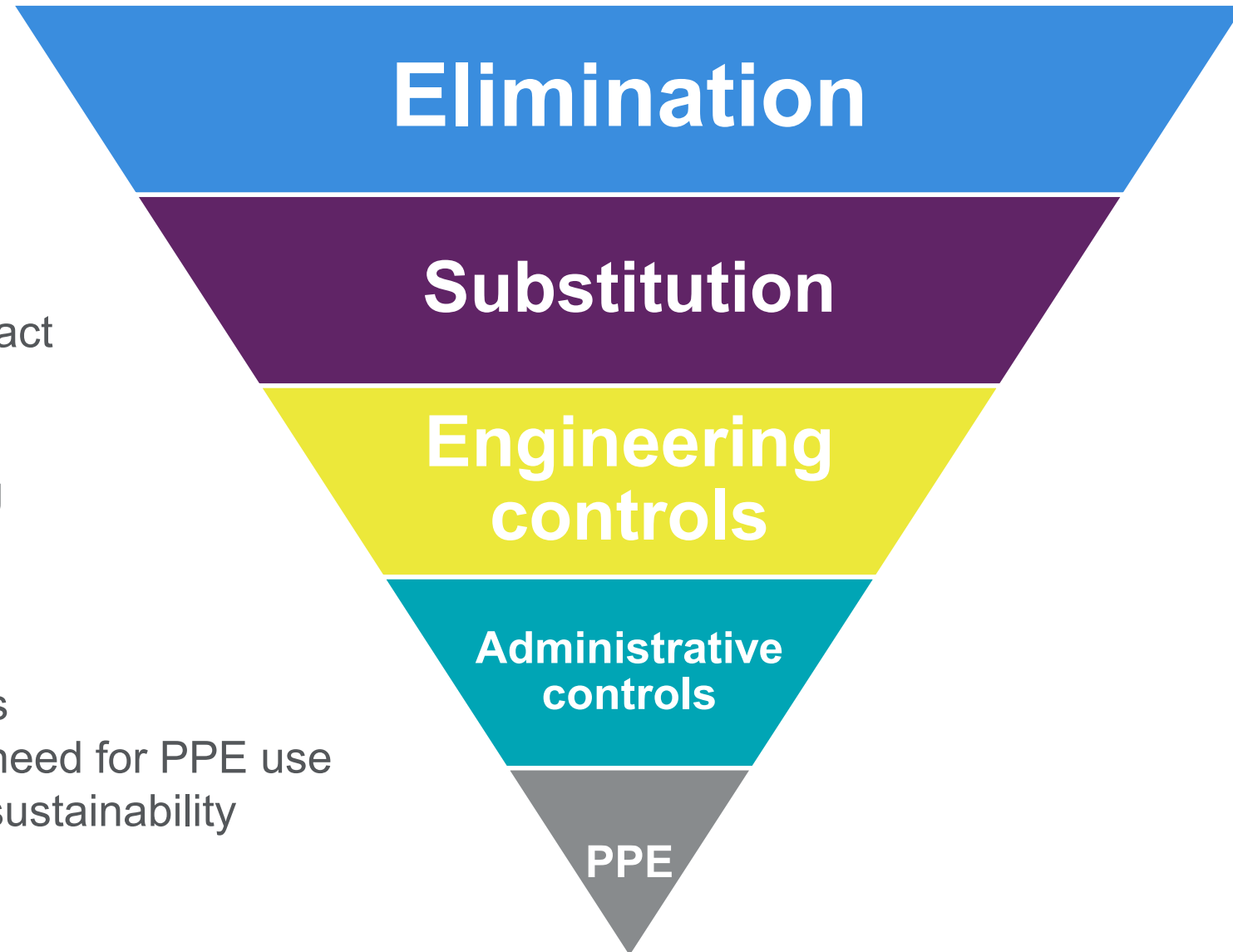
- Liquid fluoride requires minimum contact

## Engineering controls

- Properly designed storage and venting
- Properly designed metering system

## Personal barriers- PPE

- Address PPE for higher risk operations
- Reduced higher risk times= Reduced need for PPE use
- Reduced waste disposal = Increased sustainability



# How feed systems work

# Dry fluoride feed via saturator



## Mechanism

- Add dry fluoride and water
- Saturated in water to 4%
- Saturator and finished tank
- Metered in via pump
- Dose level fluoride probe

## Drawbacks

- Routine chemical contact
- Saturation accuracy
- Shuts down if bed not sufficient
- Messy, waste
- Cleanout process

# Liquid Fluoride Feed



## Mechanism

- Solution arrives in drums, totes or bulk
- Solution fed directly or via day tank
- Positive displacement metering pump
- Dose level fluoride probe

## Advantages

- Concentration assay in a lab
- Minimal if any daily operator contact
- Improved consistency
- Reduced waste (especially if bulk or minibulk)

# Liquid fluoride feed

Indoor or  
outdoor  
storage tanks



Metering  
pump

Day tank- scaled

**Minimal operator contact required!**

# Fluoride treatment chemicals feed comparison

## Parameters

Plant size	1 MGD (multiply use by your flowrate)
Target fluoride in finished water	0.7 mg/L
Initial fluoride level	0.0 mg/L
Liquid fluoride concentration	23% w/w
SF assay	98%
SSF assay	99%

Even using the smallest packaged liquid fluoride, you are reducing the operator contact with the chemical by using liquid vs. dry.

Chemical	Equation	Pounds per day	Bags/week	Drums/week
Sodium Fluoride	$= (\text{MGD} \times 8.34 \times 0.7) / (0.98 \times 0.4525)$	13.16	1.84	NA
Sodium Silicofluoride	$= (\text{MGD} \times 8.34 \times 0.7) / (0.99 \times 0.607)$	9.73	1.36	NA
Hydrofluorosilicic Acid	$= (\text{MGD} \times 8.34 \times 0.7) / (0.23 \times 0.792)$	32.06	NA	0.4

- **Proper Maintenance/Upkeep**
  - **Tanks**
  - **Pumps**
  - **Probes**
  - **Scales**
- **Good Housekeeping**
- **Accurate Recordkeeping**
- **Use of PPE when needed**

**Important  
Points**



## Safety

- ✓ Minimal contact
- ✓ Reduced exposure due to a closed system
- ✓ Reduced need for PPE use
- ✓ Reduced waste handling

## Simplicity

- ✓ Liquid chemistry
- ✓ Metering pump dosing
- ✓ Little or no disposal
- ✓ Simple engineering and implementation

# Communicating Effectively with Customers

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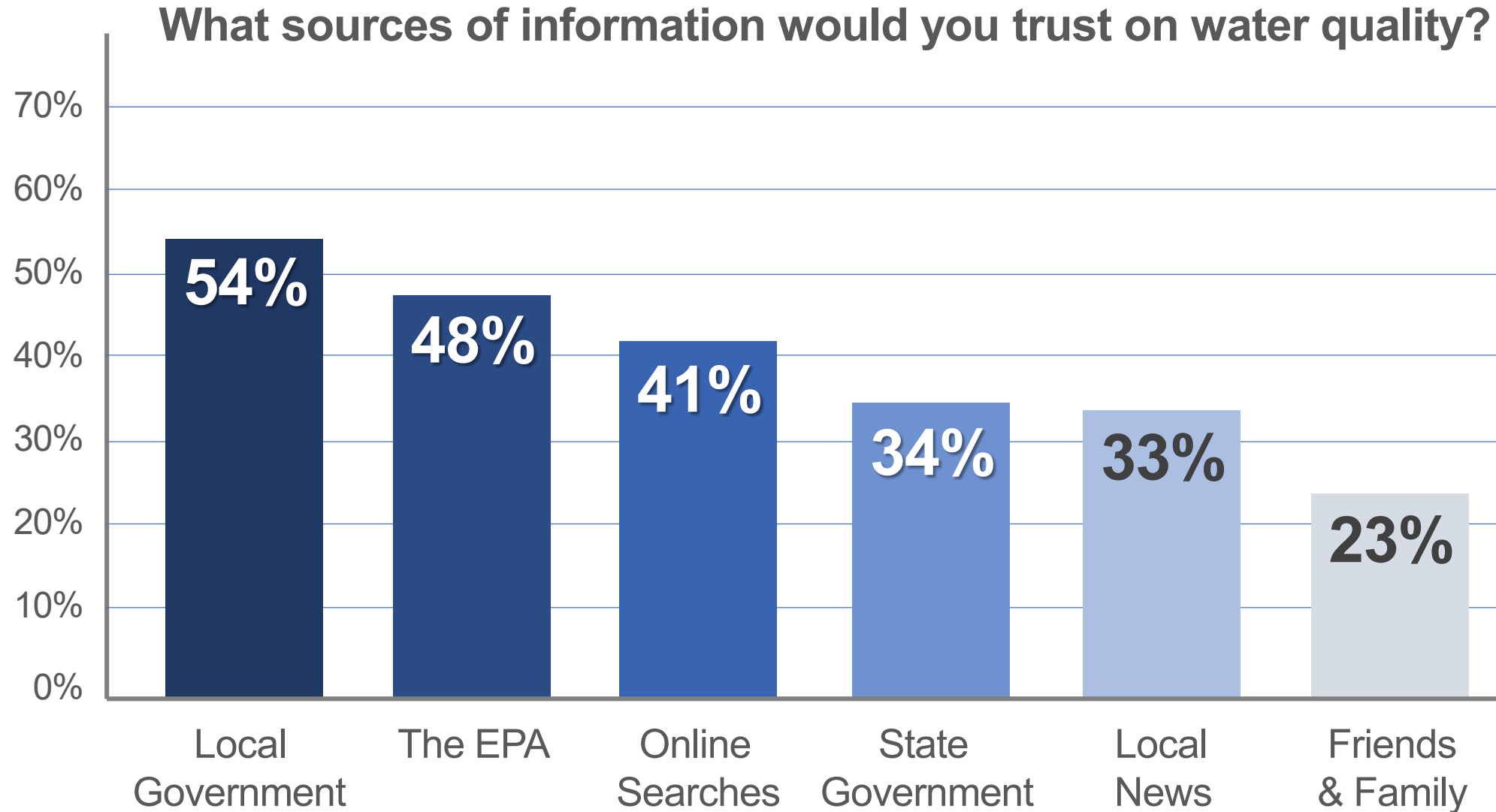
Matt Jacob

Communication Consultant, Jacob Strategies



# 4 tips for talking about fluoride with policy makers and the public

# Virginians trust local governments the most



# 4 tips for talking with non-scientific audiences

1. **Have an FAQ or fact sheet on your home page** that answers the most frequent questions that customers ask



# 4 tips for talking with non-scientific audiences

1. **Have an FAQ or fact sheet on your home page** that answers the most frequent questions that customers ask

## ***Make it reader-friendly:***

- Use **plain language** to make it easy to understand
- Be careful about using “contaminant” and other terms that have a *different meaning in federal law* than they have to ordinary people

# 4 tips for talking with non-scientific audiences

1. **Have an FAQ or fact sheet on your home page** that answers the most frequent questions that customers ask

## ***Use content from reliable sources:***

- **The CDC** has an FAQ on its website that can serve as a model:  
<https://www.cdc.gov/fluoridation/faq/index.html>
- **The Harvard–Kennedy School** (*The Journalist's Resource*)  
<https://journalistsresource.org/home/here-are-the-answers-to-15-common-questions-about-fluoride-in-drinking-water/>



# 4 tips for talking with non-scientific audiences

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2. **Provide context** by citing the reason for water fluoridation — the desire to reduce the tooth decay rate of local residents

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Substance	Likely Source	Richmond's Results	Richmond's Range	MCL
Fluoride (ppm)	Added to promote dental health	0.81	0.35 - 0.81	4
Nitrate + Nitrite (ppm)	Fertilizer runoff, septic tank leakage, sewage, erosion of natural deposits	0.26		
Total Organic Carbon Removal Ratio <sup>3</sup>	Naturally present in source water	1.0	0.6 to 2.0	TT removal ratio ≥ 1.0

# 4 tips for talking with non-scientific audiences

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2. **Provide context** by identifying fluoride as a **mineral** that exists naturally in lakes, rivers and groundwater

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3. **Offer analogies and metaphors** to improve understanding

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What is true for fluoride is also true for **many vitamins and minerals**. They can have negative effects if a very high amount is consumed. The low level used in fluoridation is safe.



# 4 tips for talking with non-scientific audiences

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3. **Offer analogies and metaphors** to improve understanding

Fluoride toothpaste and fluoridated water are *both* important. They work in a complementary way — **much like seatbelts and air bags.**



# 4 tips for talking with non-scientific audiences

1. Have an FAQ or fact sheet on your home page that answers the most frequent questions that customers ask
2. Provide context by identifying fluoride as a mineral that exists naturally in lakes, rivers and groundwater
3. Offer analogies and metaphors to improve understanding
4. **Establish a clear protocol** within your water department for when and how water personnel reply to emails/letters about fluoride

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4. **Establish a clear protocol** within your water department for when and how water personnel reply to emails/letters about fluoride
  - Decide **who** is authorized to reply



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2. Provide context by identifying fluoride as a mineral that exists naturally in lakes, rivers and groundwater
3. Offer analogies and metaphors to improve understanding
4. **Establish a clear protocol** within your water department for when and how water personnel reply to emails/letters about fluoride
  - Decide **who** is authorized to reply
  - Decide **what** they should say and then use the same language consistently

# An example of a template response

Thanks for sharing your views. Fluoride is a mineral that exists naturally in lakes, rivers and groundwater. Fluoridation is the process used for adjusting the fluoride to the recommended level to prevent dental cavities. Fluoride has a preventive effect because it strengthens the enamel coating of teeth.

Decades of research show that fluoridated water reduces cavities (tooth decay) by 25% for both children and adults.

**If the customer raises the CHOICE issue:**

Our water system does not decide whether to adjust the level of fluoride in drinking water. That decision is made by the [name of the city council, water board, etc.].

To learn more about water fluoridation, consider the following resources:

# An example of a template response

Thanks for sharing your views. Fluoride is a mineral that exists naturally in lakes, rivers and groundwater. Fluoridation is the process used for adjusting the fluoride to the recommended level to prevent dental cavities. Fluoride has a preventive effect because it strengthens the enamel coating of teeth.

Decades of research show that fluoridated water reduces cavities (tooth decay) by 25% for both children and adults.

**If the customer raises the SAFETY issue:**

Like other minerals, fluoride is beneficial at certain levels but can have negative effects at high levels. This is why the Environmental Protection Agency of the federal government sets a maximum limit on fluoride in drinking water. The level used for water fluoridation is 80% below the agency's maximum limit. The Centers for Disease Control and Prevention (CDC) monitors the latest research about fluoride. The CDC reports that water fluoridation is "a safe and effective way" to protect teeth.

To learn more about water fluoridation, consider the following resources:

# An example of a template response

Centers for Disease Control and Prevention

<https://www.cdc.gov/fluoridation/>

American Academy of Pediatrics

<https://ilikemyteeth.org>

American Dental Association

<https://www.ada.org/resources/community-initiatives/fluoride-in-water/fluoridation-faqs>

Virginia Health Department

<https://www.vdh.virginia.gov/oral-health/cwf/>

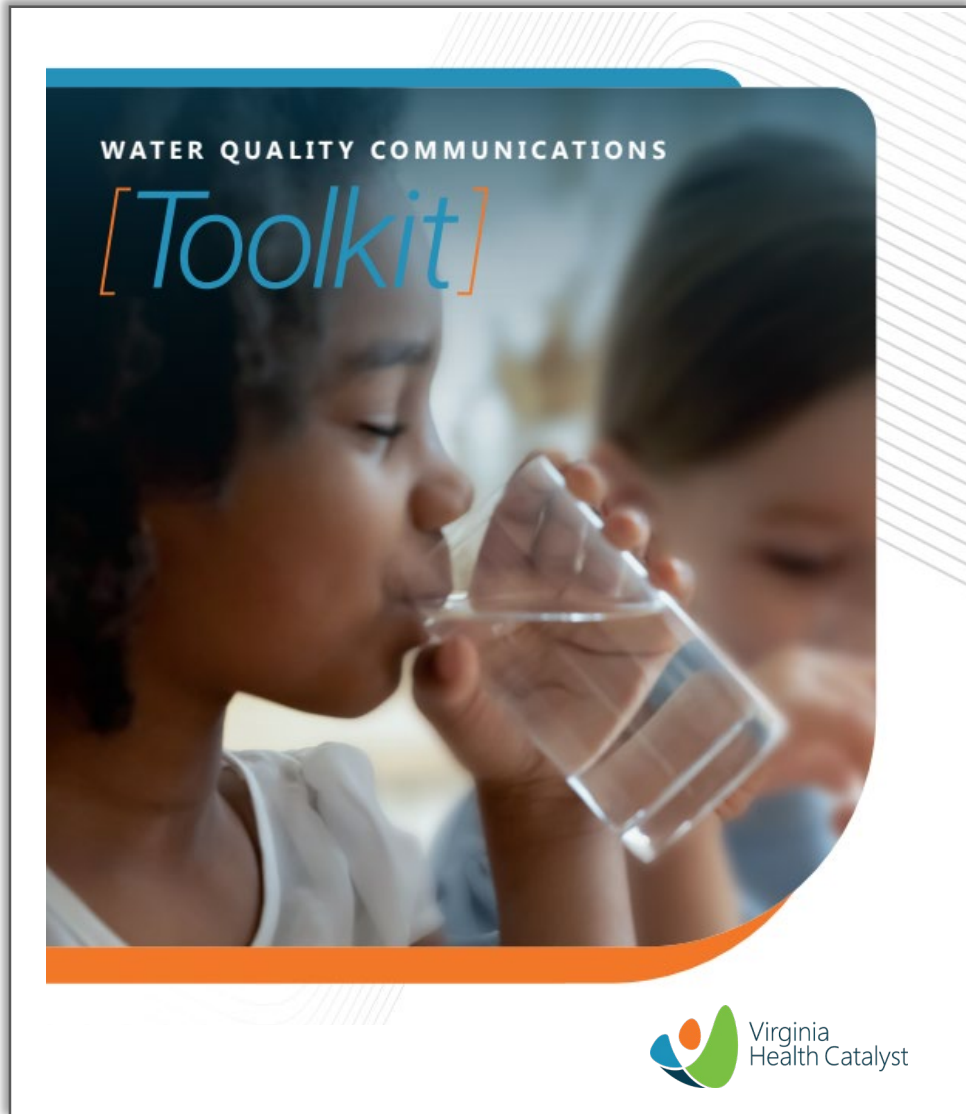
Virginia Health Catalyst

<https://vahealthcatalyst.org/community-water-fluoridation/>

American Water Works Association

<https://www.awwa.org/policy-statement/fluoridation-of-public-water-supplies/>

# An excellent resource for you



**Access the toolkit at**

**<https://tinyurl.com/water-comms-toolkit>**



# The importance of a population health approach

Water fluoridation benefits adults/children without requiring them to:

- Leave their home
- Change their schedule
- Wait in line
- Make a dental appointment
- Pay an insurance premium
- Get a prescription filled





**Matt Jacob** ♦ Jacob Strategies

**E:** [mattlivesindc@gmail.com](mailto:mattlivesindc@gmail.com)

[See my profile on LinkedIn or ORCID](#)

**I welcome your  
questions and  
comments.**



# Q&A

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Sarah Bedard Holland  
CEO, Virginia Health Catalyst



# Closing Remarks

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Jill Woodlief, BSDH, RDH  
Community Water Fluoridation Coordinator, VDH

# CWF Grant Funding

## Step-by-Step Process

- 1. Submit Grant Application.** The town manager or utilities department manager identifies a need for upgrades or replacement of fluoride equipment and supplies. A locality may apply for assistance by completing the application on the VDH website at the following link: [Fluoridation Grant Funding - Oral Health \(virginia.gov\)](#)
- 2. Formal Agreement Preparation.** Upon receiving the completed application and supporting documents, VDH will verify that the project qualifies for funding and communicate approval/disapproval by email. If approved, VDH will draft a MOU (Memorandum of Understanding) within 60 days and email the MOU to the application contact for signing. **Both parties will have 48 hours upon email receipt to review and sign it.**
- 3. Wait. DO NOT TO BEGIN** moving forward with your project until the subrecipient agreement has been fully executed which means it has been signed by all parties.
- 4. Sign Agreement.** The agreement will first be sent by email to the subrecipient for signature and returned to VDH. The agreement will then be signed by a VDH official and returned to the subrecipient. **At this point, the agreement is fully executed and the subrecipient may now place orders and begin the project.**
- 5. Begin and Complete Your Project.** Procure purchases and complete your projects as soon as possible after receiving your fully executed agreement. Follow the scope of service as requested and agreed upon by VDH. Should there be a need for changes, contact VDH immediately to discuss the need.
- 6. Request Reimbursement.** A locality must complete the project, pay vendors, and then request reimbursement from VDH by the contract end date. The request for reimbursement must be an invoice. Supporting documents must include copies of paid invoices and proof of cleared payments. *Please be advised that projects may require ODW sign off that the project was completed satisfactorily as part of the payment approval process.* Invoices and documentation must be submitted by the subrecipient directly to the following email: [OFHS-AP@vdh.virginia.gov](mailto:OFHS-AP@vdh.virginia.gov) and copy [Jill.woodlief@vdh.virginia.gov](mailto:Jill.woodlief@vdh.virginia.gov).
- 7. Receive Reimbursement.** Reimbursement should be received within 30 days of submission.

**\*Important reminder-** An agreement must be fully executed **BEFORE** ordering or purchasing grant funded items or services. The VDH cannot reimburse any receipts with dates outside of the contract agreement period.

Email questions to:

Jill Woodlief, Community Water Fluoridation Coordinator at [Jill.woodlief@vdh.virginia.gov](mailto:Jill.woodlief@vdh.virginia.gov)

## Grant Eligible Items

Category	Examples (partial list)	Notes
Equipment	<ul style="list-style-type: none"><li>Bulk tank</li><li>Replacement parts</li><li>Scales</li><li>Pumps</li><li>Feeders</li></ul>	Includes shipping
Supplies	<ul style="list-style-type: none"><li>Fluoride chemicals</li><li>Reagents</li></ul>	Includes shipping
Planning, Minor Remodeling	<ul style="list-style-type: none"><li>Electrical parts and labor</li><li>Integrating fluoride monitoring system into current SCADA</li></ul>	This includes changes to interior arrangements or other physical characteristics of an existing facility so it can be used more effectively for the sole purpose of adding fluoride to the community's water supply
Engineering and Design	<ul style="list-style-type: none"><li>Includes self-engineering and self-design</li><li>Warranty plus service partnership</li></ul>	Consult with ODW to ensure the reasonable in-house reimbursement rates
Installation	<ul style="list-style-type: none"><li>Plumbing</li><li>Electrical &amp; mechanical work</li><li>Re-piping bulk tank into feed system</li><li>Crane rental to lift bulk tank and set through roof</li></ul>	This includes fixed or semi-fixed location of a system component, complete system, or self-contained unit, with its accompanying assemblies, accessories and parts used for the sole purpose of adding fluoride to the community's water supply

## Grant Ineligible Items

Category	Examples (partial list)	Notes
Site restoration	<ul style="list-style-type: none"><li>Erection or completion of walls or floors in shell spaces</li><li>Relocation of existing exterior walls, roofs, or floors</li></ul>	Completion of space in existing buildings that would change "footprint" of existing facility
Construction	<ul style="list-style-type: none"><li>New construction</li><li>Concrete resurfacing</li></ul>	Building or erecting new buildings that would change "footprint" of existing facility



# Resources

Community Water  
Fluoridation Resources



<https://bit.ly/cwfresources>

Join Water Fluoridation Rapid  
Response Team (RRT)



<https://bit.ly/joinwfrt>



# Thank you!