



Drinking Water Testing; Results, Interpretation and Use

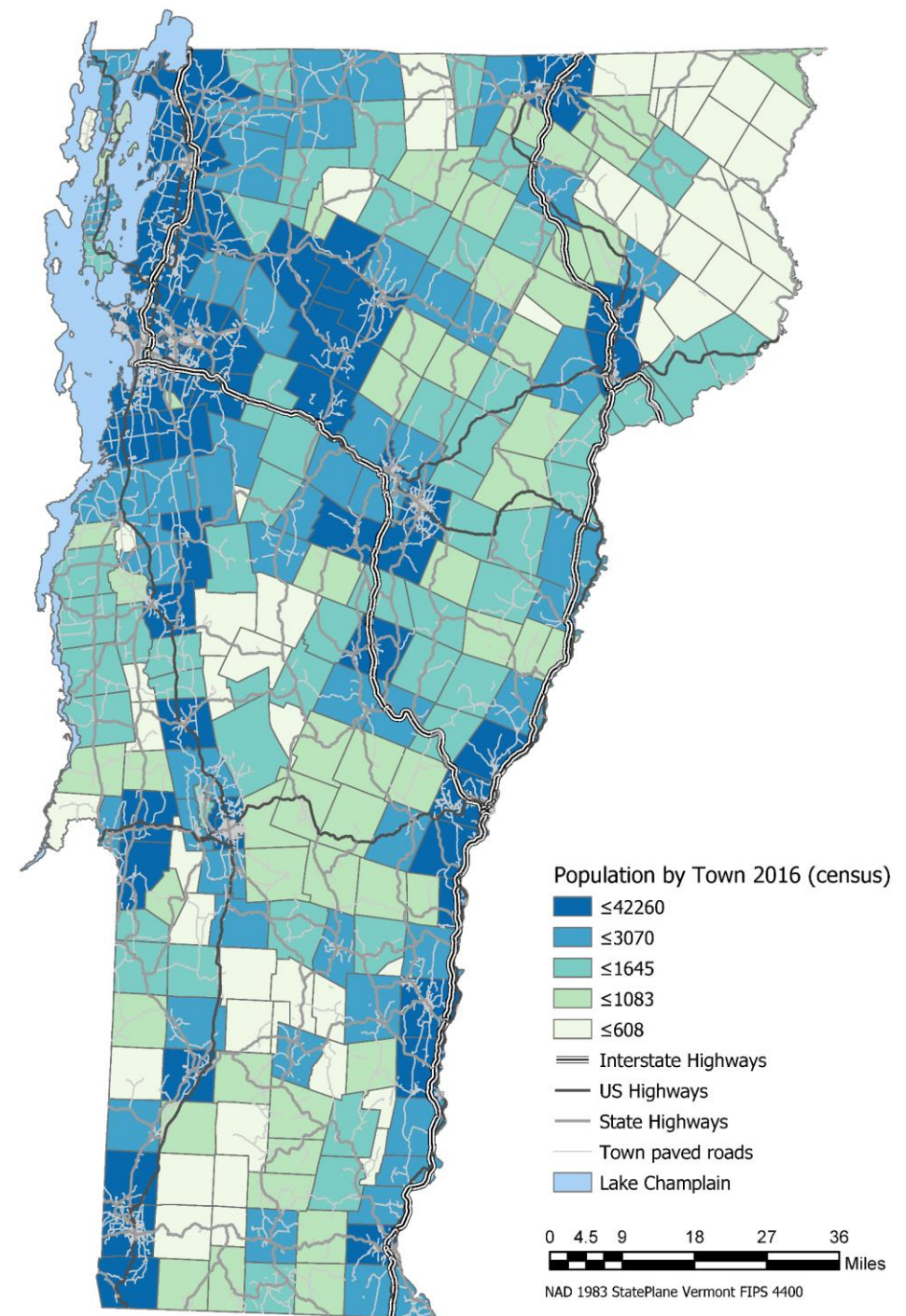
Sille Larsen

Senior Water Resources Engineer
Environmental Health, Vermont Department of Health

Background

Drinking water in Vermont

- Population of Vermont:
623,657
- Vermonters on public water:
~70%
- Vermonters on private water:
~30%
 - ▣ Private water sources tested:
~5-11%
 - ▣ >10% of results have at least
one contaminant above a level
of concern



Results Interpretation



How to Read Your Water Test Results



359 SOUTH PARK DR
COLCHESTER, VT 05430
(802) 338-4724 or (800) 660-9999
www.healthvermont.gov

This unique number is used to identify your sample results.

Results Report	State Health Dept # :	18-IC-03319
	Report Status :	Final
	Date Report Released :	07/13/2018

Report To
ATTN OF
Address



WSID

Account Name

Date Received 07/09/2018

Time Received 10:15

Approved Date 07/13/2018

Sample Desc. KIT C		Sample Collection Free	
Collection Date 07/09/2018		Total Chloride Field	
Collection Time 06:30		Field Temp	
Sample Street		Test EPA 300.0	
Town		Analyte Fluoride	
Sample		Final Result 4.37	
On		Units mg/L	
Test Anions		Limit 4.0 MCL	
Analyte Chloride		Limit 250 SMCL	
Final Result 28		Limit 1.0 MCL	
Units mg/L		Limit 10.0 MCL	
Final Result <0.10		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	
Units mg/L		Limit *	
Final Result <0.50		Limit *	

Results Interpretation

How to Read Your Water Test Results



359 SOUTH PARK DR
COLCHESTER, VT 05430
(802) 338-4724 or (800) 660-9999
www.healthvermont.gov

This unique number is used to identify your sample results.

Results Report

State Health Dept # : 18-IC-03319
Report Status : Final
Date Report Released : 07/13/2018

Report To
ATTN OF
Address

WSID
Account Name
Date Received 07/09/2018
Time Received 10:15
Approved Date 07/13/2018

Sample Desc.	KIT C	Sample Collected	07/09/2018	Sample Collected	07/09/2018
Collection Date	07/09/2018	Collection Time	06:30	Free Chlorine	1.5
Collection Time	06:30	Sample	06:30	Total Chlorine	1.5
Sample	06:30	Street	06:30	Field Chlorine	1.5
Street	06:30	Town	06:30	Field Temperature	15.4
Town	06:30	Sample	06:30	Test	EPA 300.0
Sample	06:30	Test	06:30	Limit	4.0 MCL
Test	06:30	Analyte	Final Result	Units	Limit
Analyte	Final Result	Fluoride	4.37	mg/L	4.0 MCL
Fluoride	4.37	Chloride	28	mg/L	250 SMCL
Chloride	28	Nitrite as N	<0.10	mg/L	1.0 MCL
Nitrite as N	<0.10	Nitrate as N	<0.50	mg/L	10.0 MCL
Nitrate as N	<0.50	** See below for Nitrate and/or Nitrite.			
Test Hardness (EDTA)					
Test	Hardness (EDTA)	Date/Time of Analysis	07/09/2018	Test Method	SM 2340 C
Analyte	Hardness	Limit			
Hardness		* < 5 mg/L			
Test Iron by Flame AA					
Test	Iron by Flame AA	Date/Time of Analysis	07/10/2018	Test Method	SM 3111 (B)
Analyte	Iron	Final Result	<0.10	Units	Limit
Iron	<0.10			0.3 SMCL	

The final result is how much of a chemical is in your drinking water.

The final result is how much of a chemical is in your drinking water.

Units are measured in milligrams per liter (mg/L).

The limit is the maximum amount of a chemical that is allowed in your drinking water based on federal or state standards. The unit of measure is the same as for the final result (mg/L). If the final result is above the limit, consider treating your water to reduce or remove the chemical.

The symbol "<" means "less than." Here, the nitrate level is less than 0.50.

Results Interpretation

How to Read Your Water Test Results



359 SOUTH PARK DR
COLCHESTER, VT 05430
(802) 338-4724 or (800) 660-9999
www.healthvermont.gov

This unique number is used to identify your sample results.

Results Report	State Health Dept # :	18-IC-03319
	Report Status :	Final
	Date Report Released :	07/13/2018

Report To		WSID	
ATTN OF		Account Name	
Address		Date Received	
		Time Received	
		Approved Date	07/13/2018

Sample Desc.	KIT C	Sample
Collection Date	07/09/2018	Collection
Collection Time	06:30	Free
Sample		Total
Street		Chlorine
Town		Field
Sample		Field
		Temp

Test	Anions	Date/Time of Analysis	07/09/2018 15:45
		Test Method	EPA 300.0
Analyte	Final Result	Units	Limit
Fluoride	4.37	mg/L	4.0 MCL
Chloride	28	mg/L	250 SMCL
Nitrite as N	<0.10	mg/L	1.0 MCL
Nitrate as N	<0.50	mg/L	10.0 MCL
** See below for Nitrate and/or Nitrite.			

Test	Hardness (EDTA)	Date/Time of Analysis	07/09/2018
		Test Method	SM 2340 C
Analyte	Hardness	Units	Limit
		mg/L	*
* < 5 mg/L			

Test	Iron by Flame AA	Date/Time of Analysis	07/10/2018 11:50
		Test Method	SM 3111 (B)
Analyte	Final Result	Units	Limit
Iron	<0.10	mg/L	0.3 SMCL

06:30

Units are measured in milligrams per liter (mg/L).

Final Result

Units

4.37

mg/L

28

mg/L

<0.10

mg/L

<0.50

mg/L

The final result is how much of a chemical is in your drinking water.

Units are measured in milligrams per liter (mg/L).

The limit is the maximum amount of a chemical that is allowed in your drinking water based on federal or state standards. The unit of measure is the same as for the final result (mg/L). If the final result is above the limit, consider treating your water to reduce or remove the chemical.

The symbol "<" means "less than." Here, the nitrate level is less than 0.50.

Results Interpretation

How to Read Your Water Test Results



359 SOUTH PARK DR
COLCHESTER, VT 05430
(802) 338-4724 or (800) 660-9999
www.healthvermont.gov

This unique number is used to identify your sample results.

Results Report

State Health Dept # : 18-IC-03319
Report Status : Final
Date Report Released : 07/13/2018

Report To
ATTN OF
Address

WSID
Account Name
Date Received 07/09/2018
Time Received 10:15
Approved Date 07/13/2018

Sample Desc. KIT C
Collection Date 07/09/2018
Collection Time 06:30
Sample Free
Total Chlorine
Field Chlorine
Field Temperature

Test

Analyte	Final Result	Units
Fluoride	4.37	mg/L
Chloride	28	mg/L
Nitrite as N	<0.10	mg/L
Nitrate as N	<0.50	mg/L

** See below for Nitrate and/or Nitrite.

Test

Analyte	Final Result	Units
Hardness	< 5 mg/L	mg/L

Test

Analyte	Final Result	Units
Iron	<0.10	mg/L

Date/Time of Analysis 07/09/2018 10:15
Test Method SM 2340 C

Limit
*

Date/Time of Analysis 07/10/2018 11:50
Test Method SM 3111 (B)

Limit
0.3 SMCL

The **limit** is the maximum amount of a chemical that is allowed in your drinking water based on federal or state standards. The unit of measure is the same as for the final result (mg/L). If the **final result** is above the **limit**, consider treating your water to reduce or remove the chemical.

The **limit** is the maximum amount of a chemical that is allowed in your drinking water based on federal or state standards. The unit of measure is the same as for the final result (mg/L). If the **final result** is above the **limit**, consider treating your water to reduce or remove the chemical.

The **final result** is how much of a chemical is in your drinking water.

Units are measured in milligrams per liter (mg/L).

The symbol "<" means "less than." Here, the nitrate level is less than 0.50.

Test EPA 300.0

Limit	
4.0	MCL
250	SMCL
1.0	MCL
10.0	MCL

Results Interpretation

Analyte	Final Result	Units
Fluoride	4.37	mg/L
Chloride	28	mg/L
Nitrite as N	<0.10	mg/L
Nitrate as N	<0.50	mg/L
** See below for Nitrate and/or Nitrite.		
Test	Hardness (EDTA)	Units
Analyte		
Hardness		mg/L
* < 5 mg/L		

The symbol "<" means "less than." Here, the nitrate level is less than 0.50.

How to Read Your Water Test Results



359 SOUTH PARK DR
COLCHESTER, VT 05430
(802) 338-4724 or (800) 660-9999
www.healthvermont.gov

This unique number is used to identify your sample results.

Results Report	State Health Dept # :	18-IC-03319
	Report Status :	Final
	Date Report Released :	07/13/2018

Report To	WSID
ATTN OF	Account Name
Address	Date Received
	Time Received
	Approved Date

Sample Desc.	KIT C	Sample	Free
Collection Date	07/09/2018	Collection	Free
Collection Time	06:30	Total	Free
Sample		Chloride	Free
Street		Field	Free
Town		Field	Free
Sample		Temp	Free
On			Free
The final result is how much of a chemical is in your drinking water.			
Units are measured in milligrams per liter (mg/L).			
The limit is the maximum amount of a chemical that is allowed in your drinking water based on federal or state standards. The unit of measure is the same as for the final result (mg/L). If the final result is above the limit, consider treating your water to reduce or remove the chemical.			
Test	Anions	Date/Time of Analysis	07/09/2018 15:45
Analyte	Final Result	Units	Limit
Fluoride	4.37	mg/L	4.0 MCL
Chloride	28	mg/L	250 SMCL
Nitrite as N	<0.10	mg/L	1.0 MCL
Nitrate as N	<0.50	mg/L	10.0 MCL
** See below for Nitrate and/or Nitrite.			

Test	Hardness (EDTA)	Date/Time of Analysis	07/09/2018
Analyte	Hardness	Test Method	SM 2340 C
Hardness		Limit	*
* < 5 mg/L			
Test	Iron by Flame AA	Date/Time of Analysis	07/10/2018 11:50
Analyte	Iron	Test Method	SM 3111 (B)
Iron		Limit	0.3 SMCL

Results Interpretation



359 SOUTH PARK DR
COLCHESTER, VT 05430
(802) 338-4724 or (800) 660-9999
www.healthvermont.gov

This unique number is used to identify your sample results.

State Health Dept # : 18-IC-03319
Final
07/13/2018

Inorganic Limits			StarLIMS Requirements			Comment to appear
mg/L						
Uranium	0.020	VMCL	Given the final reported result of Uranium is > 0.020 mg/L a comment will appear on the report.	No WSID	Comment #1	The result for Uranium is greater than the Vermont Maximum Contaminant Level of 0.020 mg/L. Treatment is recommended.
					Comment #2	For guidance and treatment recommendations, please visit www.healthvermont.gov/water-contaminants . If you have any further questions, please call 802-863-7220 or 800-439-8550 (toll-free in Vermont).
				WSID present	only comment	The result for Uranium is greater than the Vermont Maximum Contaminant Level of 0.020 mg/L.


maximum amount of a chemical allowed in your drinking water is the same as for the federal or state standards. If the final result is above the maximum amount, you may need to treat your water to remove the chemical.


	0.300	VHA	Given the final reported result of Manganese is > 0.300 mg/L a comment will appear on the report.	No WSID	Comment #1	The result for Manganese is greater than the Vermont Health Advisory of 0.300 mg/L. Treatment is recommended.
					Comment #2	For guidance and treatment recommendations, please visit www.healthvermont.gov/water-contaminants . If you have any further questions, please call 802-863-7220 or 800-439-8550 (toll-free in Vermont).
				WSID present	only comment	The result for Manganese is greater than the Vermont Health Advisory of 0.300 mg/L.


Date of Analysis 07/10/2018 11:50
Test Method SM 3111 (B)


Limit
0.3 SMCL


Resources


[ASBESTOS & LEAD IN BUILDINGS](#)


[CHILDREN'S ENVIRONMENTAL HEALTH](#)


[CLIMATE & HEALTH](#)


[DRINKING WATER](#)


[ENVIRONMENTAL CHEMICALS & POLLUTANTS](#)


[ENVIRONMENTAL PUBLIC HEALTH TRACKING](#)


[FOOD & LODGING PROGRAM](#)


[HEALTHY HOMES](#)

[HEALTHY SCHOOLS](#)

[RADIOLOGICAL HEALTH](#)

[RECREATIONAL WATER](#)

[TOWN HEALTH OFFICERS](#)

[PLANS & REPORTS](#)

CONTACT:
Environmental Health Division
108 Cherry Street
P.O. Box 70 – Drawer 30

HOME / HEALTH & THE ENVIRONMENT / DRINKING WATER /

ARSENIC IN DRINKING WATER

Arsenic comes in different forms. It is a natural element found in rocks and soil. It can also come from human activities and is used in some consumer products. Every day you take in very small amounts of arsenic from air, water and food. Food, particularly seafood and fish, is usually the main source. But this form of arsenic is different than the arsenic in rocks and soil, and is not as harmful to your health.


- › [Health Concerns: Is arsenic harmful to my health?](#)
- › [Source: How does arsenic get into my water?](#)
- › [Testing: How do I know if arsenic is in my water?](#)
- › [Treatment Options: Can I remove or lower the levels of arsenic in my water?](#)
- › [Financial Assistance: Is there funding available to help me pay for my water system or treatment?](#)

RESOURCES

[Find a water treatment specialist](#) ⓘ

[Find a licensed well driller](#) ⓘ

[Find an NSF-certified home water treatment system](#) ⓘ

[View Map: Arsenic in Vermont Private Wells](#) ⓘ

- [Arsenic and You: water testing information from Dartmouth College](#) ⓘ
- [Arsenic and You: water treatment information from Dartmouth College](#) ⓘ
- [Arsenic in air, consumer products, and pressure treated wood](#)

Use of Data

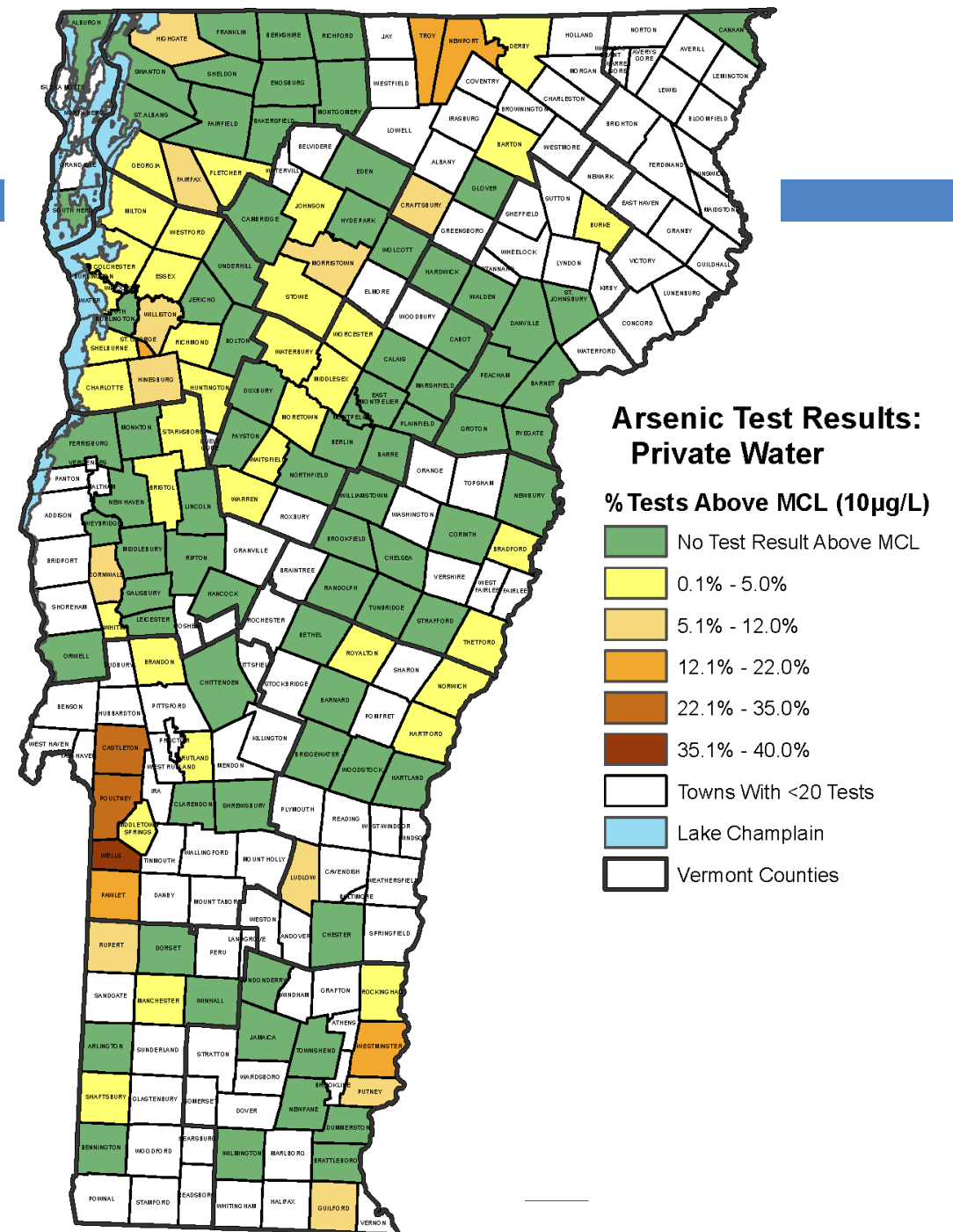
Arsenic

- ❑ Naturally occurring (VT: Non Detects – 327 ug/L)
- ❑ MCL: 10 ug/L
- ❑ Potent carcinogen (1 in 300 cancer risk)
- ❑ Used the map for targeted outreach to towns

Map and more information:

<http://www.healthvermont.gov/water/arsenic>

Data source: Vermont Department of Health Laboratory 2003-2016,
Vermont Geological Survey 2002-2014



Use of Data

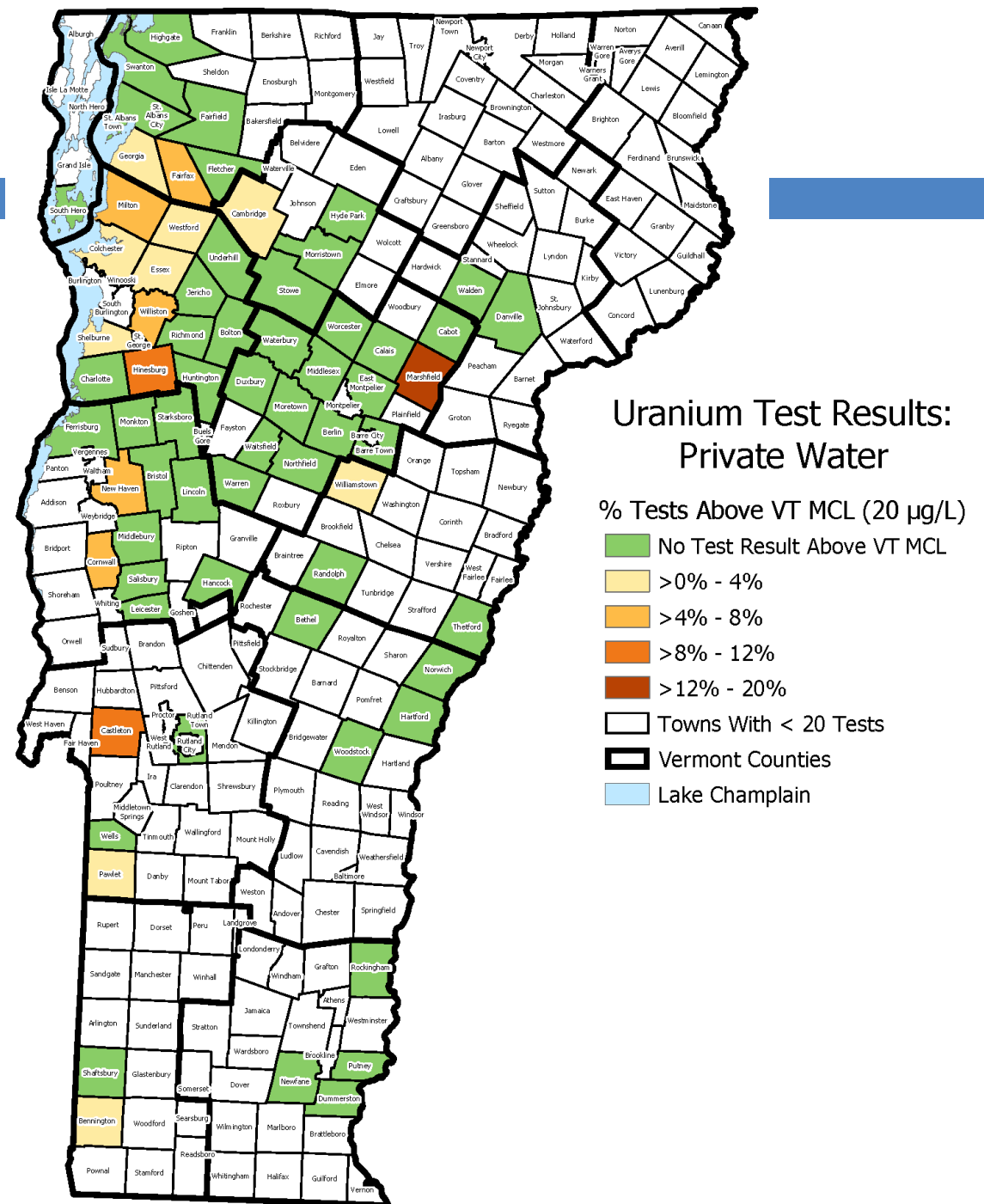
Uranium

- Naturally occurring (VT: Non Detects – 797 ug/L)
- VT MCL: 20 ug/L
 - ▣ Damage to kidney cells
- One of several radionuclides in bedrock
 - ▣ Others include; radium, radon

Map and more information:

<http://www.healthvermont.gov/water/radioactive-elements>

Data source: Vermont Department of Health Laboratory 2012-2018



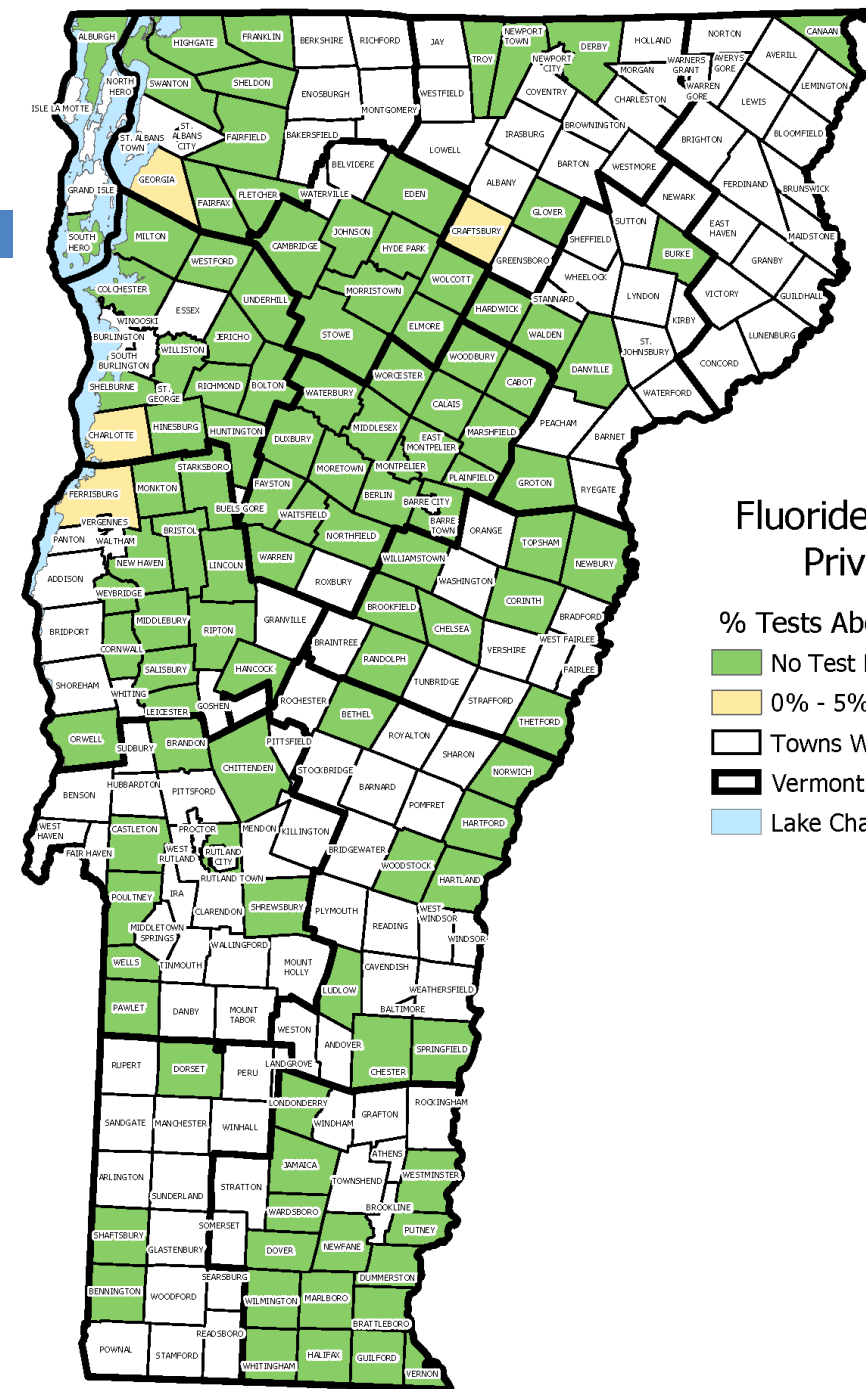
Use of Data

Fluoride

- Naturally occurring (VT: Non Detects – 9.74 mg/L)
- High levels are due to presence of fluoride-rich rock formation
- Primary MCL: 4 mg/L
 - ▣ Bone disease
- Secondary MCL: 2 mg/L
 - ▣ Browning, pitting of teeth
- Public water: 0.7 mg/L
 - ▣ Mitigating effect against dental caries

Map and more information:

<http://www.healthvermont.gov/water/fluoride>



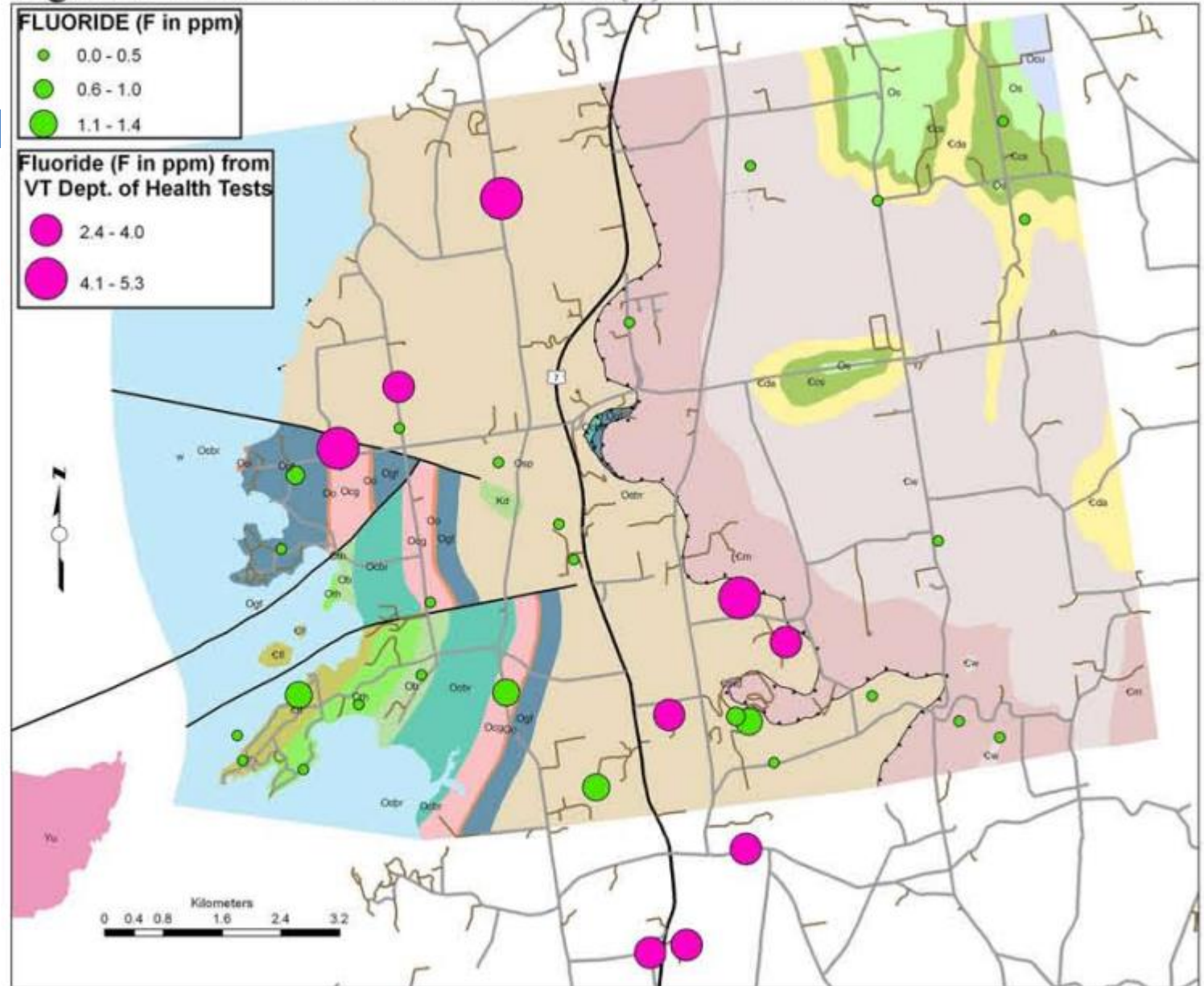
Water testing

Groundwater testing in the Town of Charlotte

- By Vermont Geological Survey and Middlebury College
- Summer 2009
- 27 wells
- Metals and non-metals

<https://dec.vermont.gov/geological-survey>

Figure 7- Scaled Levels of Fluoride (F) in Charlotte Wells






EPA Primary MCL (health) for fluoride is 4 ppm. EPA Secondary MCL (odor, taste, color) for fluoride is 2 ppm.


More info


www.healthvermont.gov/water
www.healthvermont.gov/water-contaminants


Resources


**HEALTH & THE ENVIRONMENT**


**ASBESTOS & LEAD IN BUILDINGS**


**CHILDREN'S ENVIRONMENTAL HEALTH**


**CLIMATE & HEALTH**


**DRINKING WATER**


**ENVIRONMENTAL CHEMICALS & POLLUTANTS**


**ENVIRONMENTAL PUBLIC HEALTH TRACKING**


**FOOD & LODGING PROGRAM**

**HEALTHY HOMES**

**HEALTHY SCHOOLS**

**RADIOLOGICAL HEALTH**


**RECREATIONAL WATER**

**TOWN HEALTH OFFICERS**

QUICK LINKS | ALERTS | GET HELP NOW | HOW HEALTHY ARE WE?

HOME / HEALTH & THE ENVIRONMENT /

DRINKING WATER





About Drinking Water
Drinking water is a shallow well of knowledge. It's not just about the water itself, but also about the health effects of contaminants and the role of the household (EPA) in protecting their water.


It is important that the Department can provide you with guidance on what to test for and when, how to treat your flood.


For questions about the **health effects of contaminants**, call 802-863-7220 or 800-439-8550 (toll-free in Vermont).


To **order drinking water test kits**, call the Vermont Department of Health at 802-338-4736 or 800-660-9997 (toll-free in Vermont).


Recommended contaminants to test for and
Drinking Water Guidance (for contaminant levels)
Results for the lead in school drinking water


**PUBLIC HEALTH LABORATORY**


**DRINKING WATER TESTING**


**ENVIRONMENTAL TESTING**


**CLINICAL TESTING**


**RABIES TESTING**

**FOOD SAFETY TESTING**

**LABORATORY EMERGENCY PREPAREDNESS**

**LABORATORY CERTIFICATION OR APPROVAL**

**FORMS & ORDERING INFORMATION**

**CONTACT US/DIRECTIONS**


CONTACT:

Public Health Laboratory
359 South Park Drive
Colchester, VT 05446

QUICK LINKS | ALERTS | GET HELP NOW | HOW HEALTHY ARE WE? | SEARCH

HOME / PUBLIC HEALTH LABORATORY / DRINKING WATER TESTING /

A-Z DRINKING WATER CONTAMINANTS



The links below will help you learn more about drinking water, including your own.

- what the contaminants are
- how the contaminants enter the water
- how to test for the contaminants
- how to treat for the contaminants

The Health Department uses different types of drinking water. If your water is contaminated above the guidance level may pose some health risks. [Learn more about Vermont's drinking water guidance levels](#)

CONTAMINANTS

- Antimony
- Arsenic
- Bacteria (Total Coliform, *E. coli*)

QUESTIONS?

Call: 802 863 7233
or visit: healthvermont.gov/water

Thank you for listening!