August 2015

VERMONT
ENVIRONMENTAL CONSERVATION

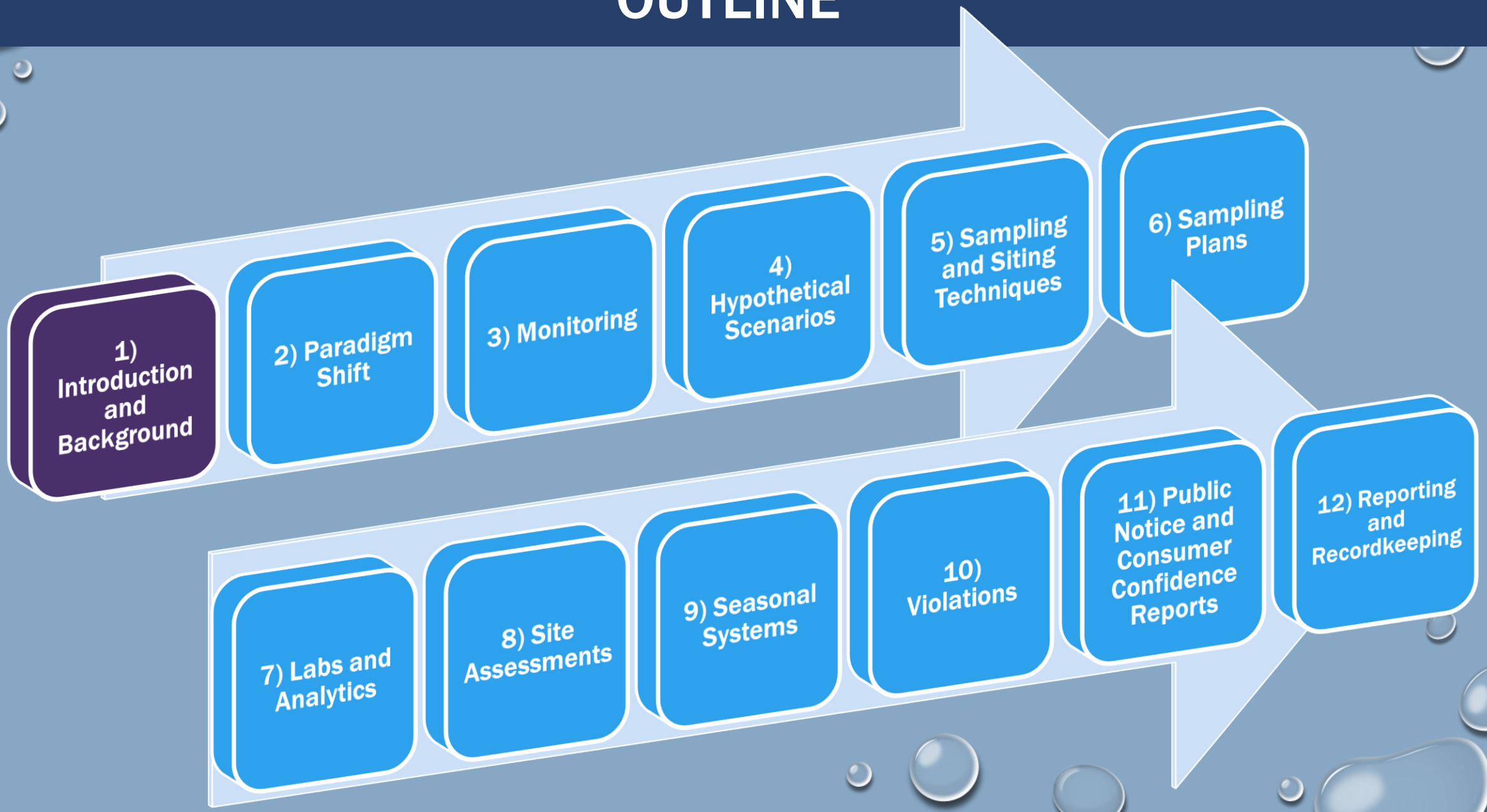
REVISED TOTAL COLIFORM RULE (RTCR)

Implementation Date: April 1, 2016

http://www.drinkingwater.vt.gov/index.htm

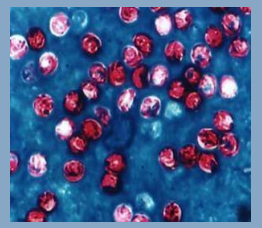
DRINKING WATER AND GROUNDWATER PROTECTION DIVISION

OUTLINE

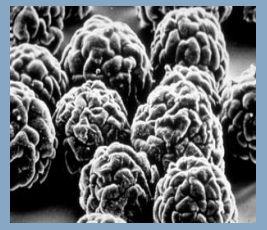

1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

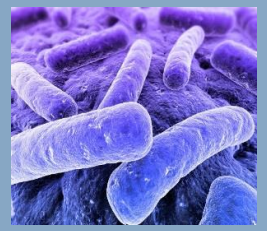
BACKGROUND: TOTAL COLIFORM RULE

- Published 1989, effective 1990
- There are a variety of waterborne pathogens that can cause health issues:


cryptosporidium oocysts

giardia lamblia


poliovirus


legionella

enterococci

- Total coliform is an indicator of the presence of waterborne pathogens
- Regular monitoring of total coliform bacteria to:
  - Verify the integrity of the distribution system
  - Evaluate the effectiveness of treatment
  - Signal possible fecal contamination

BACKGROUND: TOTAL COLIFORM RULE

- Total coliform MCL = 0 MPN
- Routine monitoring for TC at a frequency proportional to system population
- Follow-up sampling required for TC+
- <u>MCL Violations (based on sample results)</u>
  - Non-acute (total coliform):
    - Systems under 33,000: 2 or more TC+ samples in a month
    - Systems above 33,000: 5% or more samples are TC+ in a month
  - Acute (E. coli):
    - TC+ RT with EC+ RP
    - EC+ RT with TC+ RP
- Monitoring and Reporting Violations for failure to report sample results
- Public Notice required for MCL and M&R Violations
- All violations must be reported in the Consumer Confidence Reports

TRANSITIONING AWAY FROM THE TOTAL COLIFORM RULE

The TCR has been successful in protecting against waterborne disease and outbreaks.

<u>However</u>

- The number of violations have remained steady
- Any improvements likely to occur under the TCR have largely been achieved

Question:

How can we achieve greater public health protection?

TRANSITION TO THE REVISED TOTAL COLIFORM RULE

Goal

Increase protection of public health by reducing **sanitary defects** that allow fecal contamination and/or waterborne pathogens to enter a distribution system or could indicate a failure or imminent failure in a barrier that is already in place.

TRANSITION TO THE RTCR

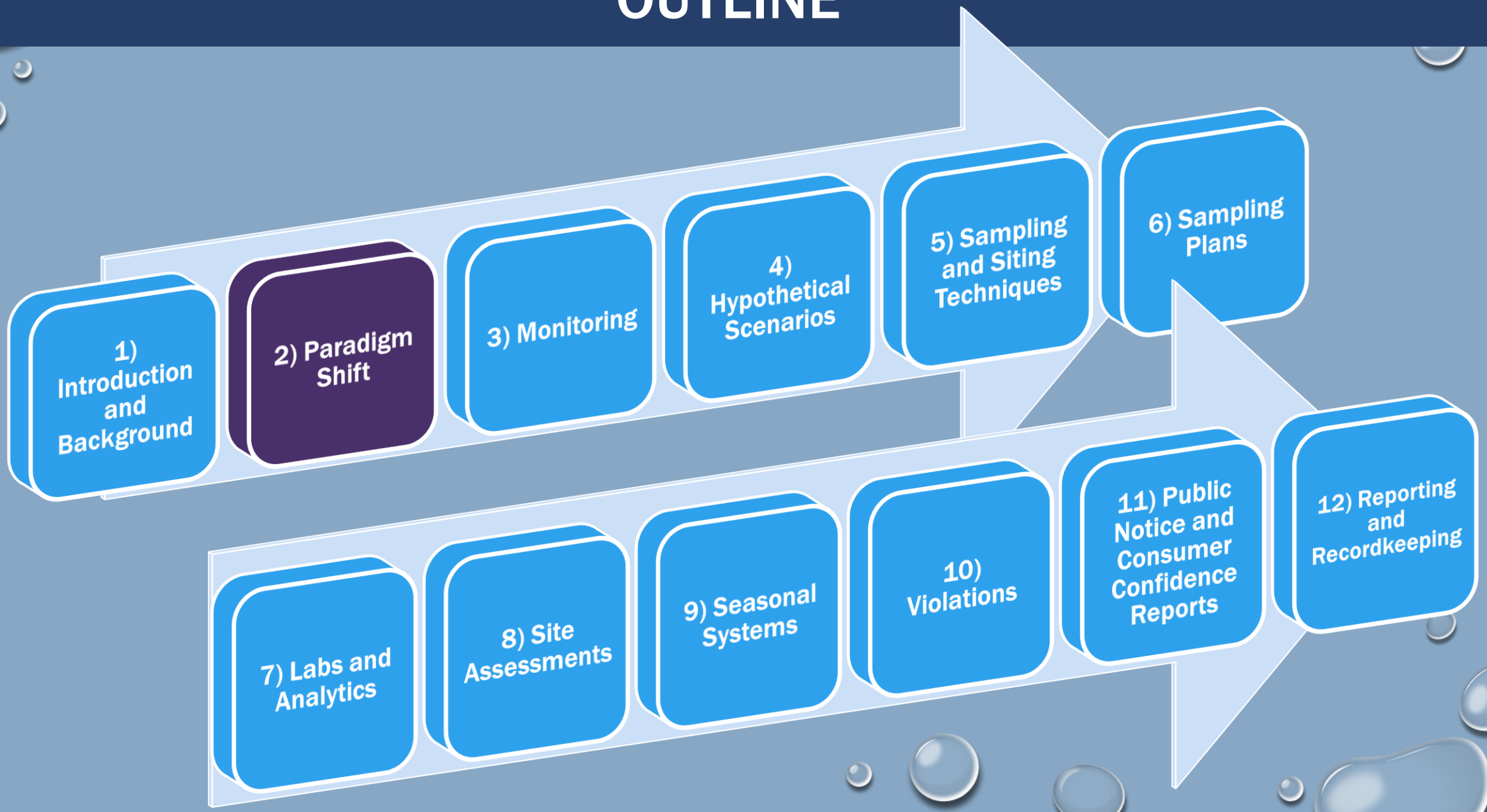
What will stay the same?

1. Continue to conduct bacteriological monitoring
2. Continue to use total coliform and E. coli as indicators

What will change?

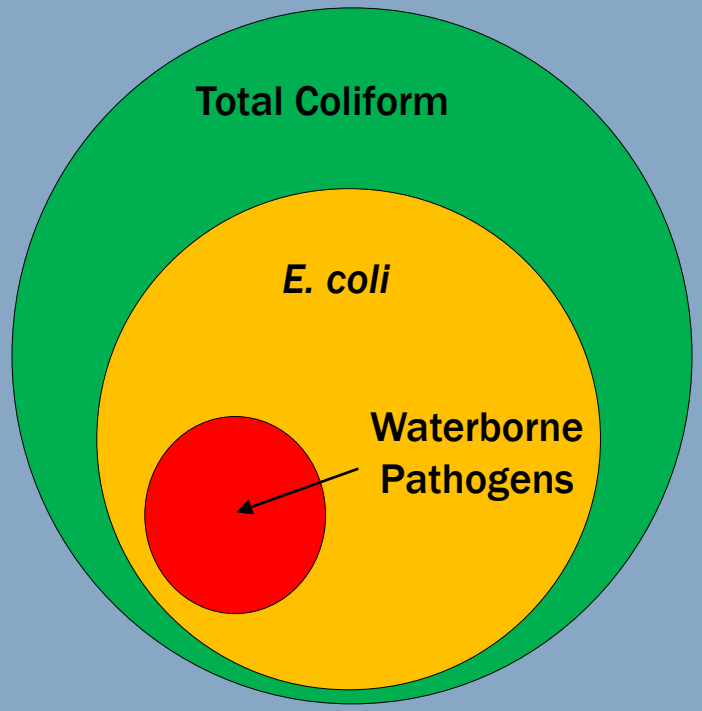
1. "Find and Fix"
2. More stringent requirements for maintaining quarterly monitoring for Non-Community systems (where applicable)
3. Increased requirements for "seasonal" systems
    1. Monthly Sampling for groundwater systems
    2. Completion of State-approved start-up procedure
4. Completion of Bacteriological Monitoring Plans

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

TOTAL COLIFORM BACTERIA AS AN INDICATOR

- Total Coliforms are still used as an indicator of system integrity
- However, total coliforms are not an immediate health concern on their own



NO MORE TOTAL COLIFORM MCL

E. COLI BACTERIA AS AN INDICATOR

- E. coli still an indicator for fecal contamination
- E. coli MCL = 0 MPN maintained from the TCR
- E. coli MCL Violations under the RTCR
  - TC+ RT → EC+ RP
  - EC+ RT → TC+ or EC+ RP
  - TC+ RT → TC+ RP and E. coli not analyzed
  - EC+ RT → No RP samples collected
- Public Notice within 24 hours required

CAUSES OF BOIL WATER IN VERMONT UNDER THE RTCR

Effective April 1, 2016

Yes	No
EC MCL	TC+ Results
Precautionary for:	
• Failure to collect RP within 24 hours following EC+	
• Operational Issues (leaks, fire events, bulk water hauling, depressurization)	
• Following certain findings in Level 1 and 2 site assessments	

"FIND AND FIX"

- TC as a more suitable indicator of system <u>operation and integrity</u> not public health
- Improved consumer confidence and public perception in water systems

SITE ASSESSMENTS UNDER THE RTCR

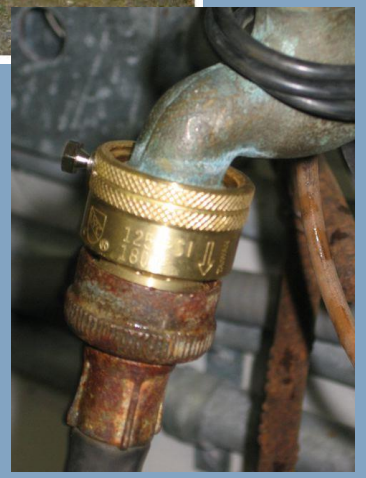
Level 1 Site Assessment

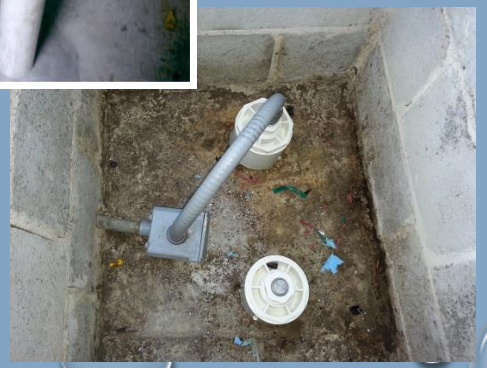
- 2 or more TC+ samples in a month
- Failure to take EVERY repeat sample following TC+ Routine sample

Level 2 Site Assessment

- E. coli MCL
- Second Level 1 trigger in 12 months

FIND AND FIX



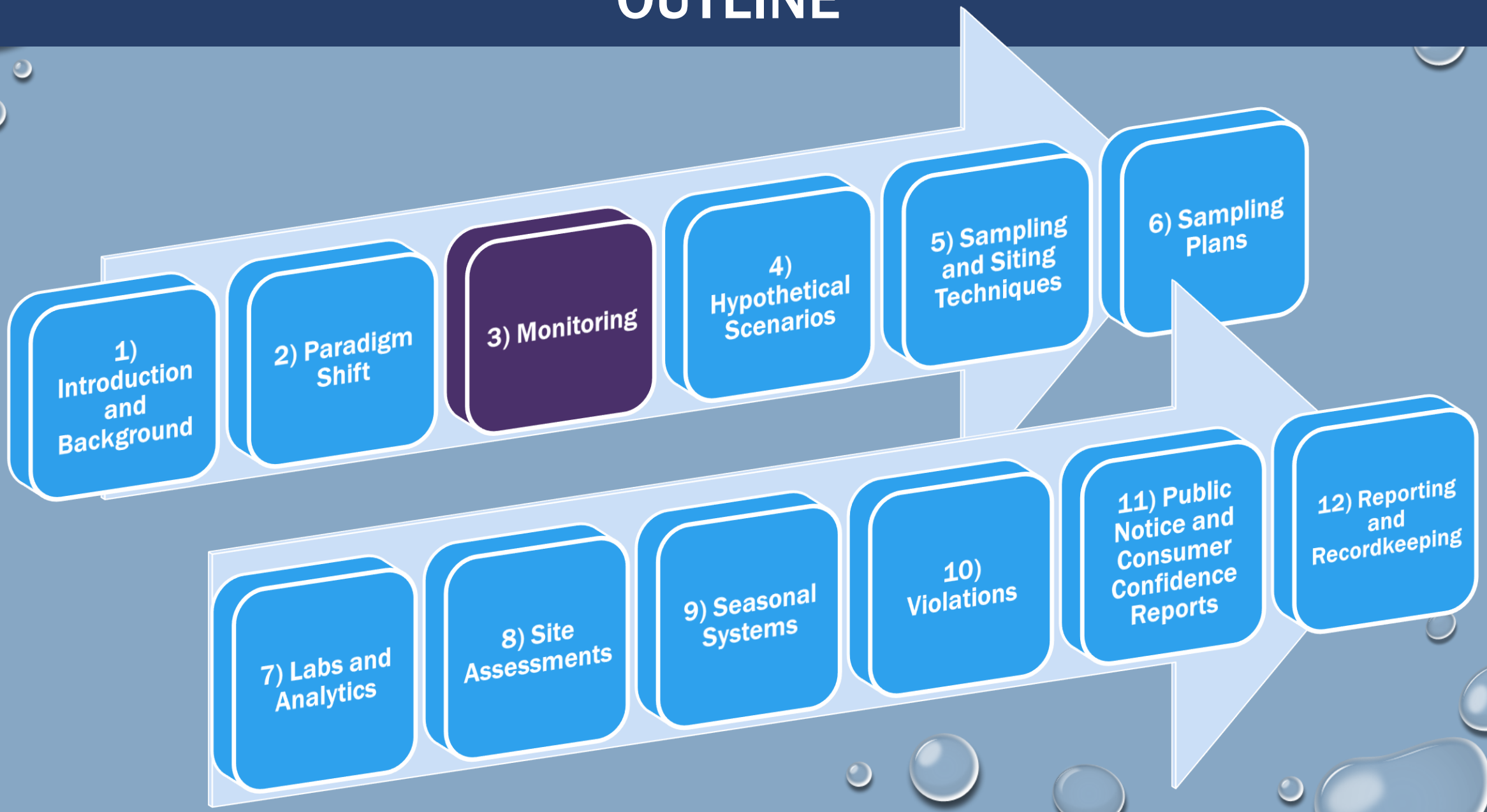


BENEFITS OF RTCR

The RTCR will result in:

- Increase in site assessments
  - → Decrease in TC/EC +
    - → Decrease in public health risk
  - → Increased operator knowledge of system operation
- Better system performance over time
- Certain "violations" under the current TCR become "triggers" under the RTCR

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

NUMBER OF SAMPLES PER MONITORING PERIOD

Population	Number of Samples
25 – 1,000	1
1,001 – 2,500	2
2,501 – 3,300	3
3,301 – 4,100	4
4,101 – 4,900	5
4,901 – 5,800	6
5,801 – 6,700	7
6,701 – 7,600	8

Population	Number of Samples
7,601 – 8,500	9
8,501 – 12,900	10
12,901 – 17,200	15
17,201 – 21,500	20
21,501 – 25,000	25
25,001 – 33,000	30
33,001 – 41,000	40
41,001 – 50,000	50

- Systems taking more than 1 sample must take the samples at regular intervals throughout the month.
- Groundwater Systems under 4,900 may take all samples on the same day if taken from different locations.

SPECIAL MONITORING EVALUATIONS DURING SANITARY SURVEY

- Evaluate water system factors
  - Water quality history
  - Compliance History
  - Established barriers of protection
- Used to validate:
  - Existing sampling locations and rationale
  - Sampling Frequencies
- Monitoring schedule and locations may change following the Evaluation.

SAMPLING FREQUENCIES UNDER RTCR

- All Surface Water/GWUDI Systems: **Monthly** (Same as TCR)
- Community Water Systems: **Monthly** (Same as TCR)
- Non-Community, GW, over 1,000 in population: **Monthly** (Same as TCR)
- **Seasonal**, Transient Non-Community Systems: **MONTHLY**
- Year-round Non-Community, served by GW, under 1,000 in population: **Quarterly** (Same as TCR) **until…**

Transition to Monthly Monitoring

Year-round, Non-Community, on Groundwater, under 1,000 in population: Sample Quarterly unless and until ONE of the following happens:	
1) Level 2 Trigger	-E. coli MCL Violation -2 X Level 1 Site Assessments
2) E. Coli MCL Violation	-TC+ RT ➔ EC+ RP -EC+ RT ➔ TC+ RP (or EC) -TC+ RT ➔ TC+ RP and E. coli not analyzed -EC+ RT ➔ No Repeats Taken
3) Total Coliform TT Violation	- Fail to conduct Level 1 or Level 2 within 30 days of trigger - Fail to correct sanitary defects in 30 days or by state-approved schedule
4) 2 RTCR Monitoring Violations or 1 RTCR Monitoring violation and 1 X Level 1 site assessment in 12 months	-Fail to RP sample - Fail to analyze EC following TC+ RT

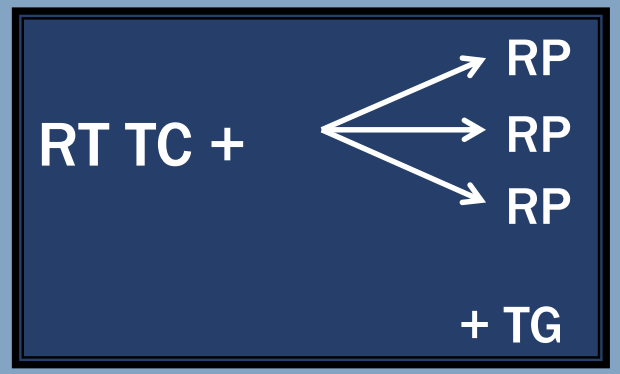
Transition (back) to Quarterly Monitoring

Year-Round, Non-Community on Groundwater, under 1,000 in population. Systems will be required to sample monthly until the issue that caused the increased monitoring is corrected and **BOTH:**
1) The system has had a sanitary survey or **voluntary** **level 2 site assessment** within the last 12 months, be free of sanitary defects, and have a protected source that meets construction standards;
2) Have a clean RTCR compliance history for the last 12 months. A clean compliance history means: No E. coli MCL violations, no monitoring violations, no TT Triggers (level 1 or 2 site assessments), and no TT violations (failure to conduct a level 1 or 2 assessment within 30 days of trigger, failure to correct sanitary defect within 30 days or under the state-approved schedule, or failure to complete seasonal startup).

Repeat Sampling Under RTCR

- Every Water System must take 3 repeat samples for EACH routine TC+ sample.
  1. Same sampling site as RT TC+
  2. +/- 5 connections/locations upstream
  3. +/- 5 connections/locations downstream

  \+ GW Systems must take 1 triggered source water sample from each source that was active at the time of the TC +.



Additional Routine Samples

The Month Following a TC + Routine Sample:

- <u>Monthly Systems</u>: Resume normal monthly sampling according to plan and schedule.

- <u>Quarterly Systems</u>: must take <u>3</u> Additional Routine samples the month following the TC + sample.

SYSTEM TAKING SINGLE MONTHLY SAMPLE

Month 1

RT + → RP 1 — Same site as original TC+

→ RP 2 — 5 connections upstream

→ RP 3 — 5 connections downstream

+ 1 TG for each active Source

Month 2

RT

If TC+ →

RP 1 — Same site as original TC+

RP 2 — w/in 5 connections downstream

RP 3 — w/in 5 connections upstream

+ 1 TG for each active Source

Sampling Example:
Multiple Monthly Routine Samples

Month 1

RT1 → TC+ → RP 1 — Same site as original TC+
→ RP 2 — 5 connections downstream
→ RP 3 — 5 connections upstream

RT2 → TC+ → RP 1 — Same site as original TC+
→ RP 2 — w/in 5 connections downstream
→ RP 3 — w/in 5 connections upstream

RT3 → TC -

+ 1 TG for each active Source

Month 2

RT1

For each TC+ → RP 1 — Same site as original TC+
→ RP 2 — w/in 5 connections downstream
→ RP 3 — w/in 5 connections upstream

RT2

+ 1 TG for each active Source

RT3

*Since 2 RT samples are TC+, it triggers an assessment

Sampling Example: Quarterly Routine Sample

Month 1

RT → TC +

- RP 1 — Same site as original TC+
- RP 2 — 5 connections downstream
- RP 3 — 5 connections upstream

+ 1 TG for each active Source

If any of the RP are TC +, an assessment is triggered

Month 2

Additional RT 1 (If TC +) → RP 1, RP 2, RP 3

Additional RT 2 (If TC +) → RP 1, RP 2, RP 3

Additional RT 3 (If TC +) → RP 1, RP2, RP 3

+ 1 TG for each active Source

If a Level 1 is triggered from Month 1, based on the RP samples and 2 or more samples are TC+ in Month 2, a Level 2 assessment is triggered. The system then must sample MONTHLY after triggering the Level 2.

QUARTERLY MONITORING AND ADDITIONAL ROUTINES

Month 1

RT + → RP 1 -, RP 2 -, RP 3 -

+ TG for each active source

Month 2

RT 1 + → RP 1 -, RP 2 +, RP 3 -

RT 2 -

RT 3 -

+ TG for each active source

Assessment triggered

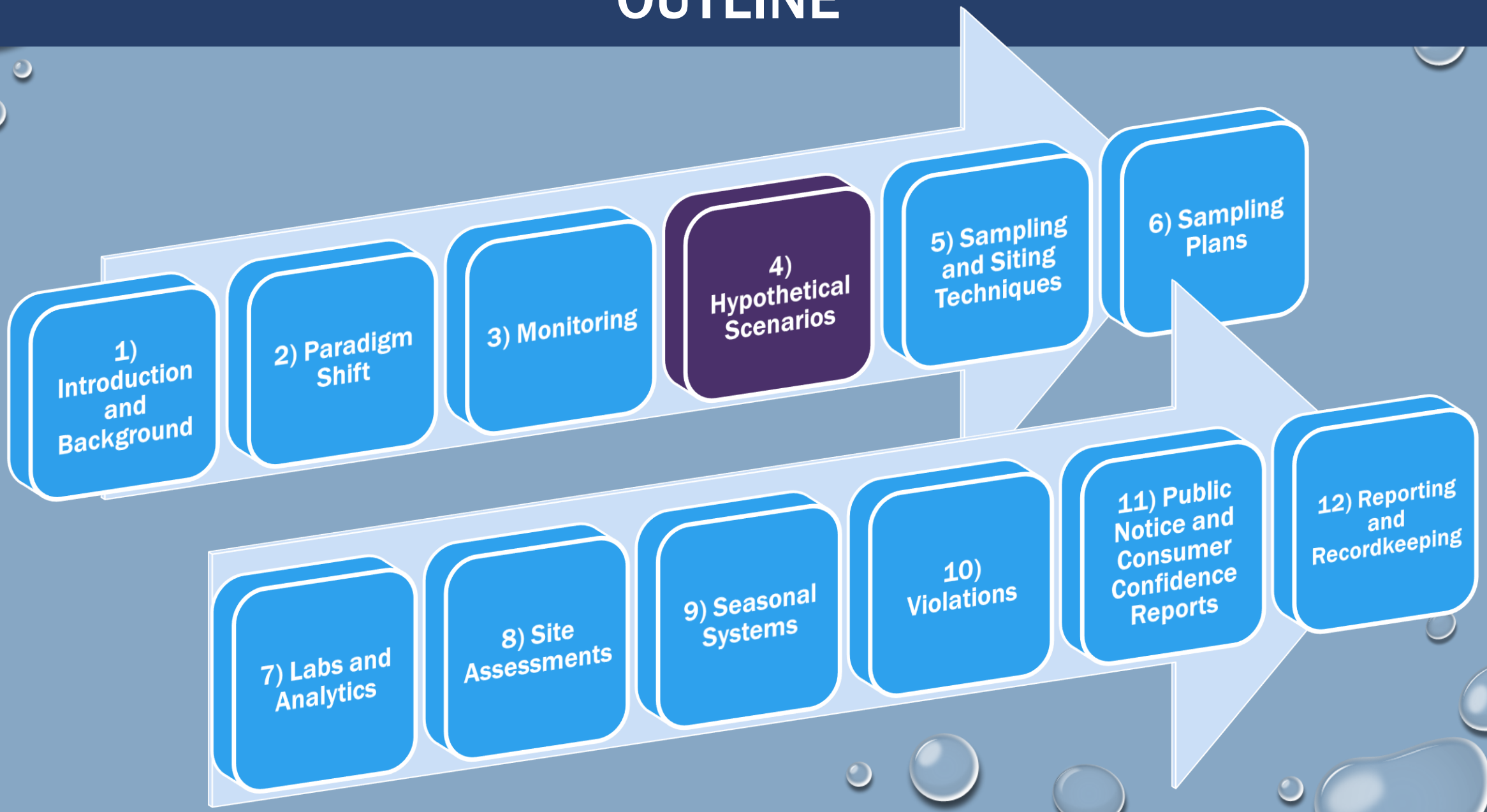
Month 3

RT 1 -

RT 2 -

RT 3 -

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

HYPOTHETICAL 1

System taking single monthly sample

Month 1

RT +

- RP 1 -
- RP 2 +
- RP 3 +

+ 1 TG for each active Source

Site Assessment Triggered

Month 2

RT -

No further action needed
(upon completion of Site Assessment)

HYPOTHETICAL 2

System Taking Multiple Monthly Samples

Month 1

RT 1 TC +
- RP 1 TC +
- RP 2 TC +
- RP 3 TC +

RT 2 TC +
- RP 1 TC +
- RP 2 TC -
- RP 3 TC +

RT 3 TC -

RT 4 TC -

+ TG for each active Source

Assessment triggered

Month 2

RT 1 TC +
- RP 1 -
- RP 2 -
- RP 3 -

RT 2 TC -

RT 3 TC +
- RP 1 +
- RP 2 -
- RP 3 +

RT 4 TC -

+ TG for each active Source

Assessment triggered

HYPOTHETICAL 3

System taking a single compliance sample (monthly or quarterly)

Month 1

RT 1 TC +

- RP 1 TC +
- RP 2 TC -
- RP 3 EC +

+ TG for each active source

EC MCL VIOLATION

1. Boil Water Notice Required
2. Level 2 Automatically triggered
3. If on quarterly monitoring: Increase to Monthly Monitoring in Month 2

HYPOTHETICAL 4

Monthly System taking single sample

Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
TC + → RP 1 -, RP 2 -, RP 3 +	TC -	TC -	TC -	TC -	TC + → RP 1 -, RP 2 +, RP 3 -

Resume monthly monitoring

Level 1 Site Assessment Triggered

Level 2 Site Assessment Triggered

WORST CASE SCENARIO: QUARTERLY SYSTEM WITH PERSISTENT ISSUES

Month 1

RT TC +
- RP 1 TC +
- RP 2 TC +
- RP 3 TC +

+ TG for each active Source

Month 2

RT 1 TC +
- RP 1 TC +
- RP 2 TC +
- RP 3 TC +

RT 2 TC +
- RP 1 TC +
- RP 2 TC +
- RP 3 TC +

RT 3 TC +
- RP 1 TC +
- RP 2 TC +
- RP 3 TC +

+ TG for each active Source

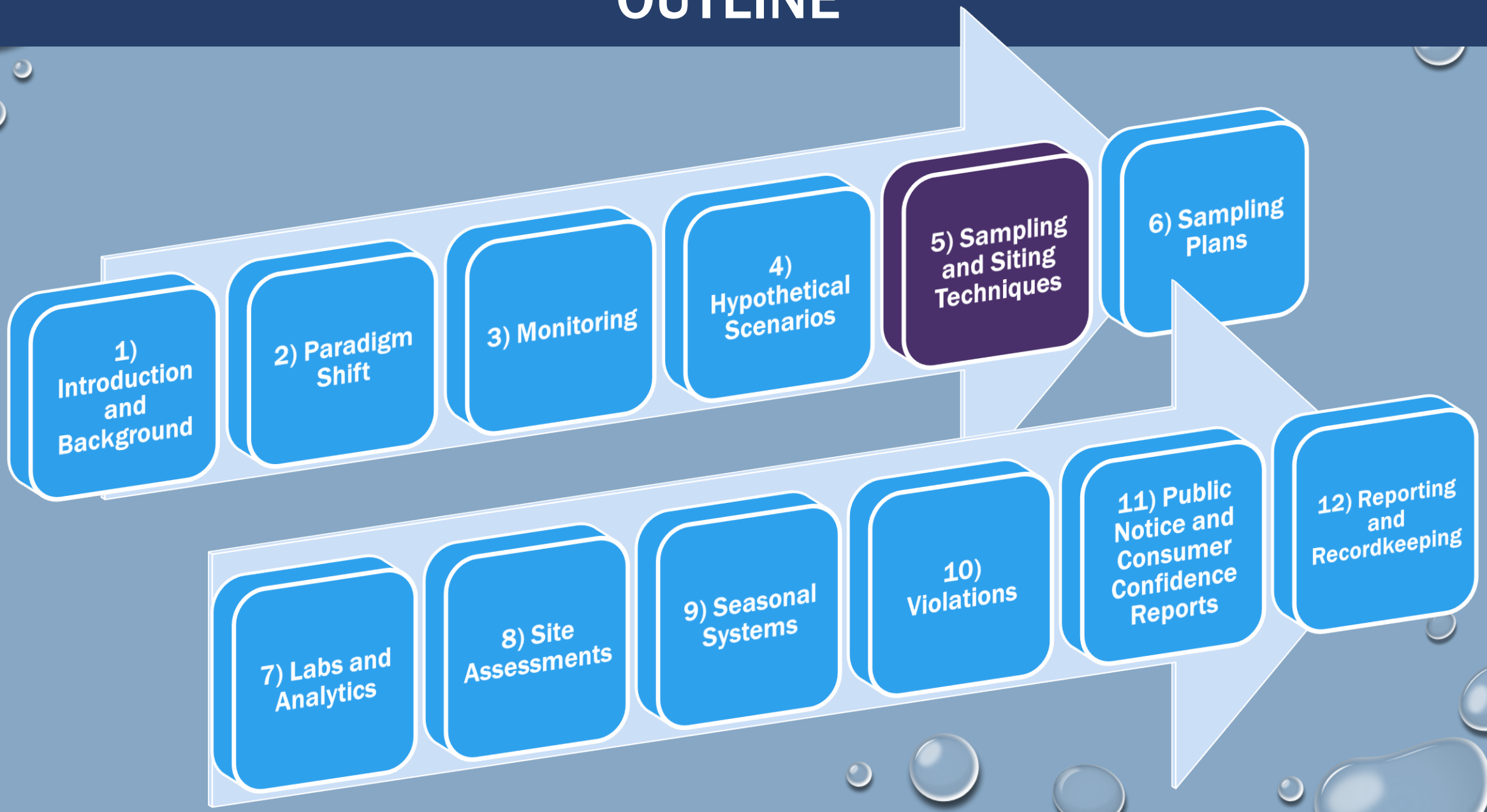
Month 3

Monthly Monitoring

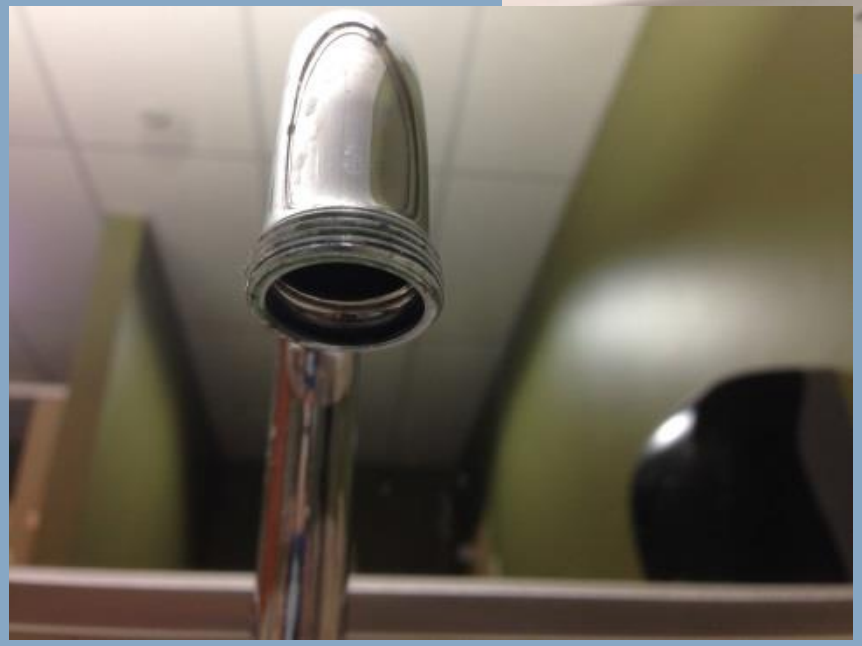
(If RT TC+
- RP 1
- RP 2
- RP 3)

*It may be possible to take 18 samples over 2 months before triggering monthly monitoring.

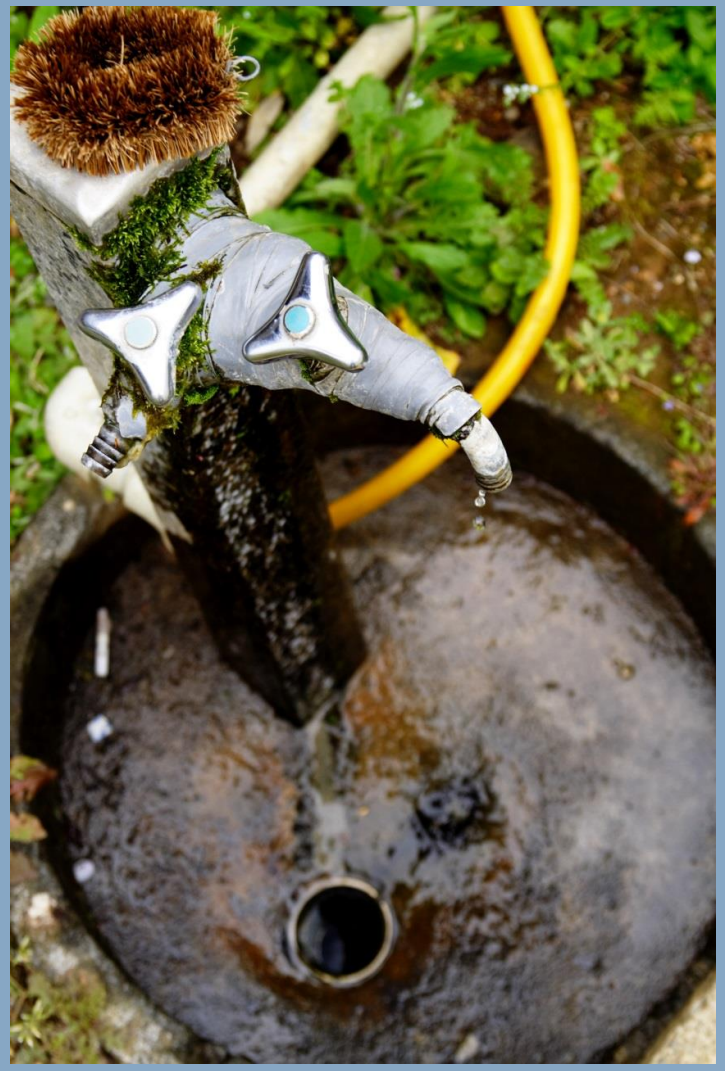
OUTLINE

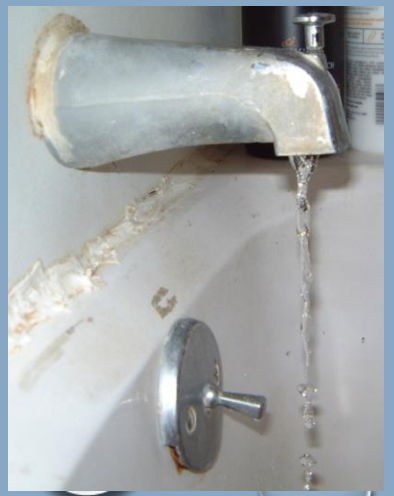

1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

SAMPLE TAP SELECTION – DOS



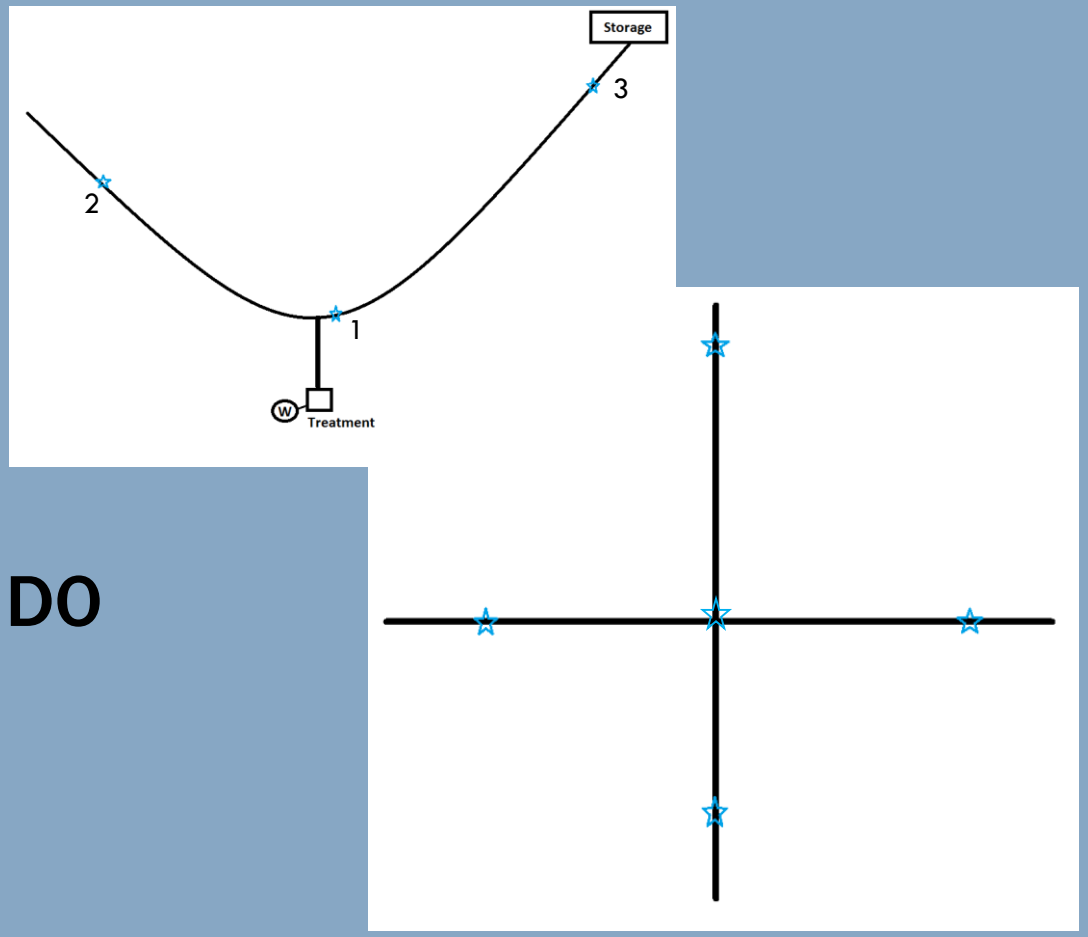
SAMPLE TAP SELECTION – DON’TS



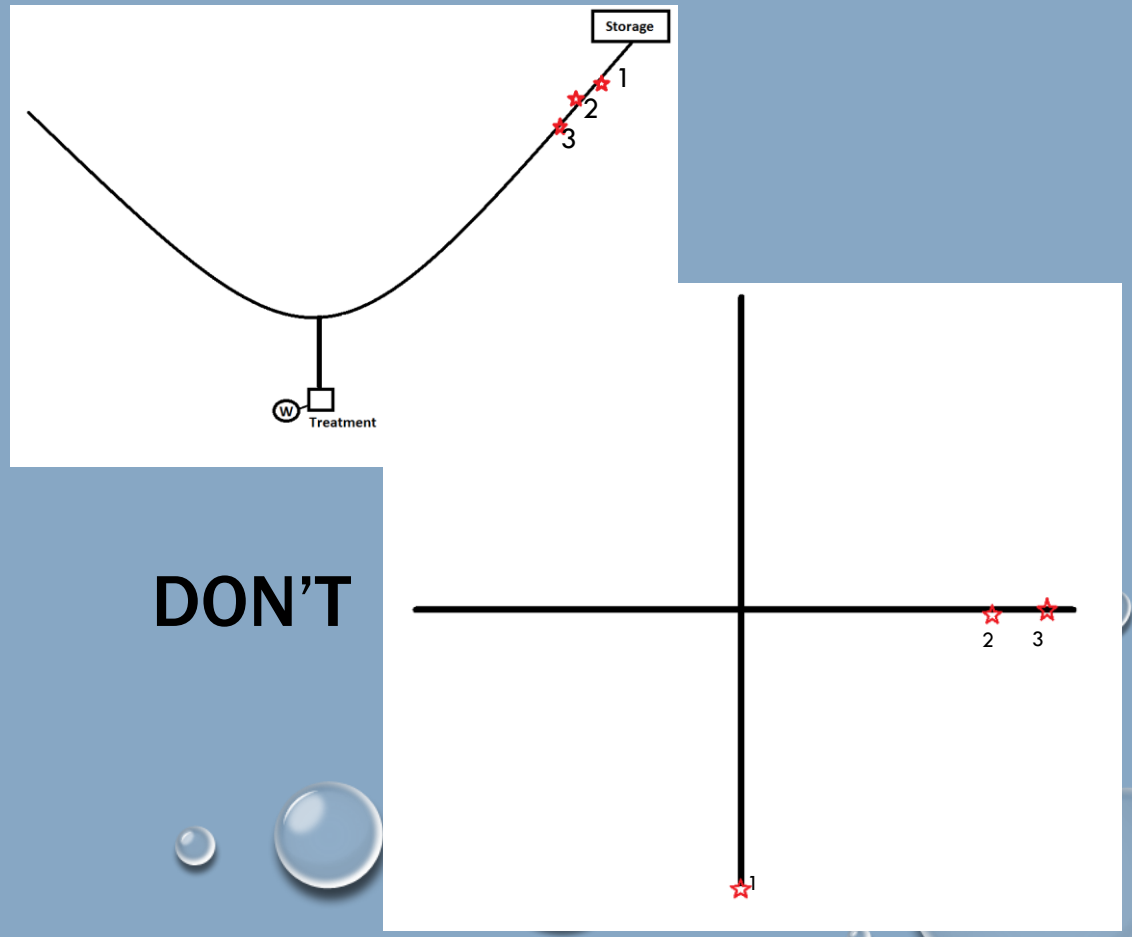


SAMPLE SITING

- Sample sites must be representative of water in the distribution system.
- Reflective of entire pressure zone/area of distribution system.



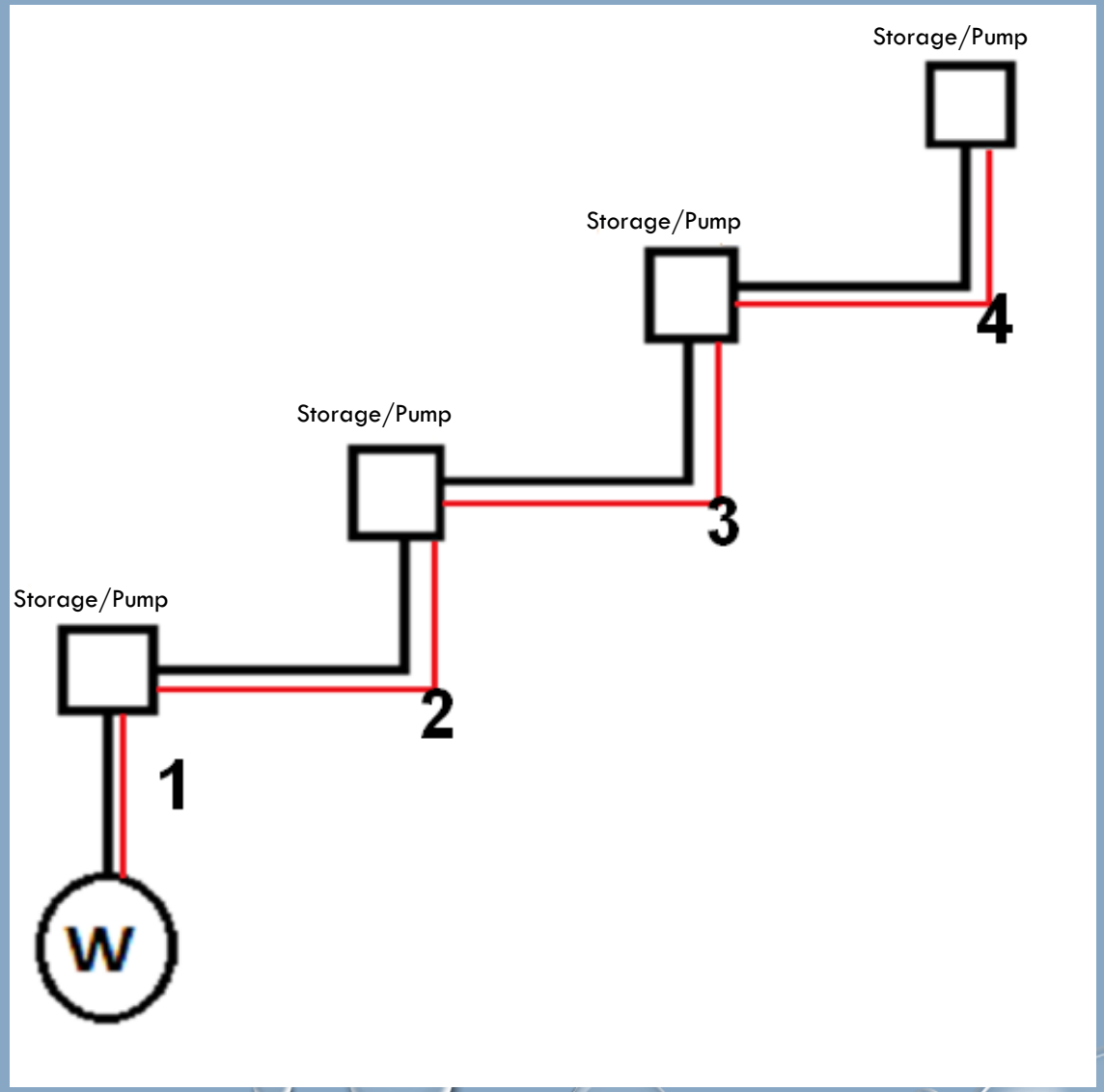
DO



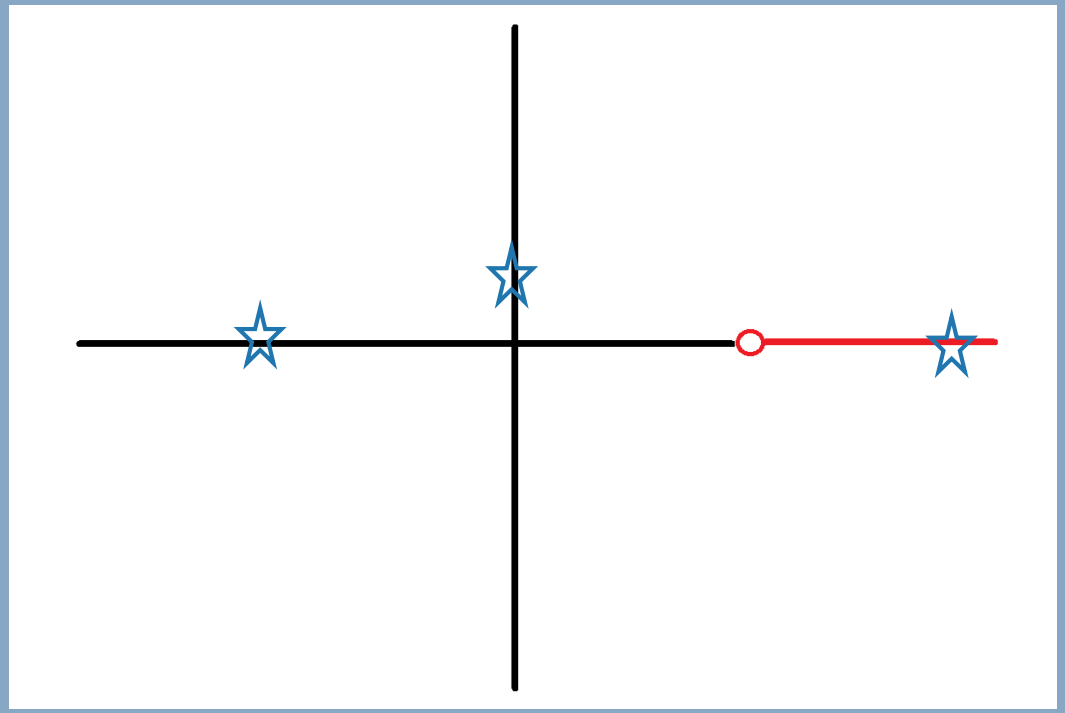
DON'T

SAMPLE SITING – PRESSURE ZONES

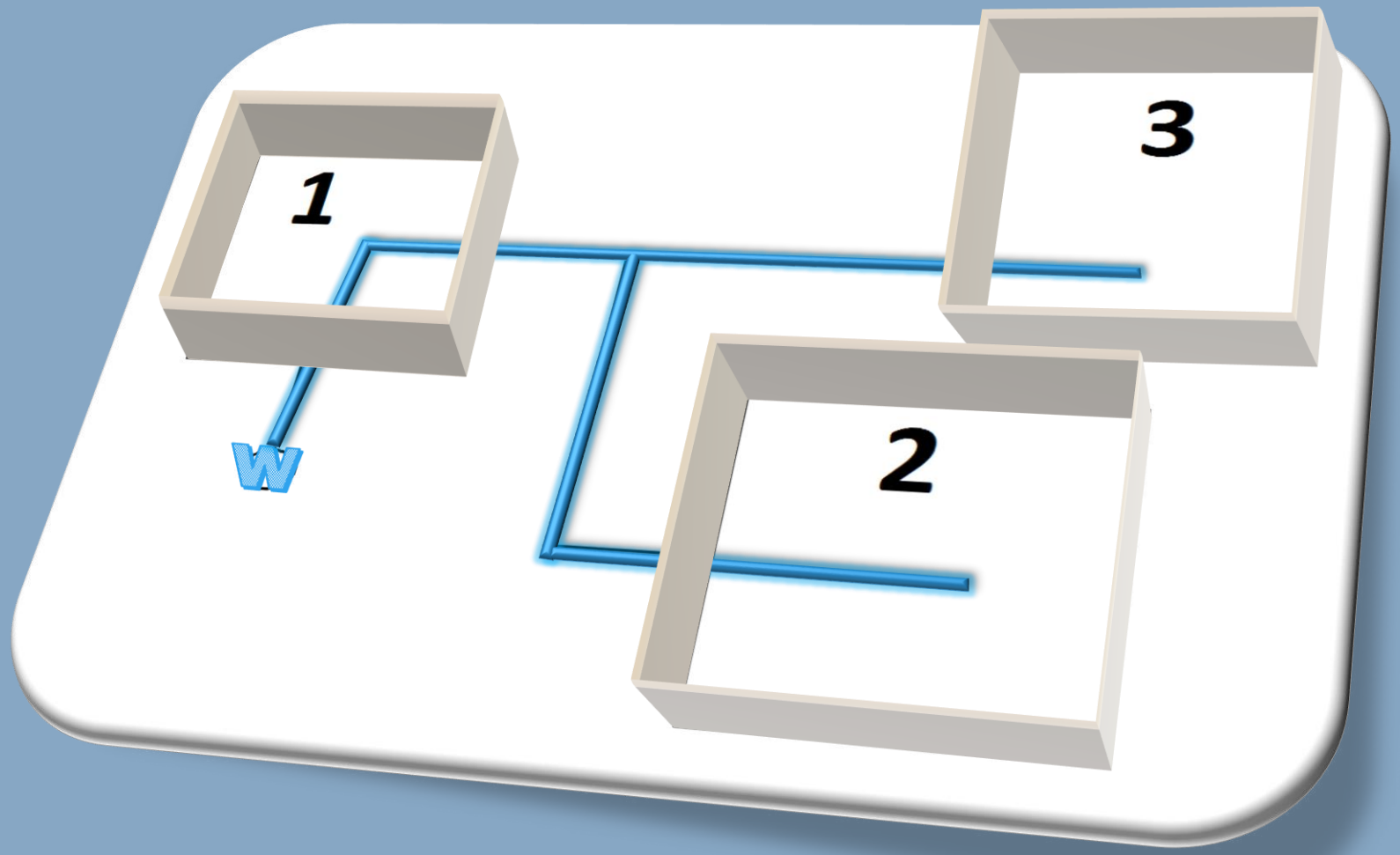
Pressure Zone, example 2



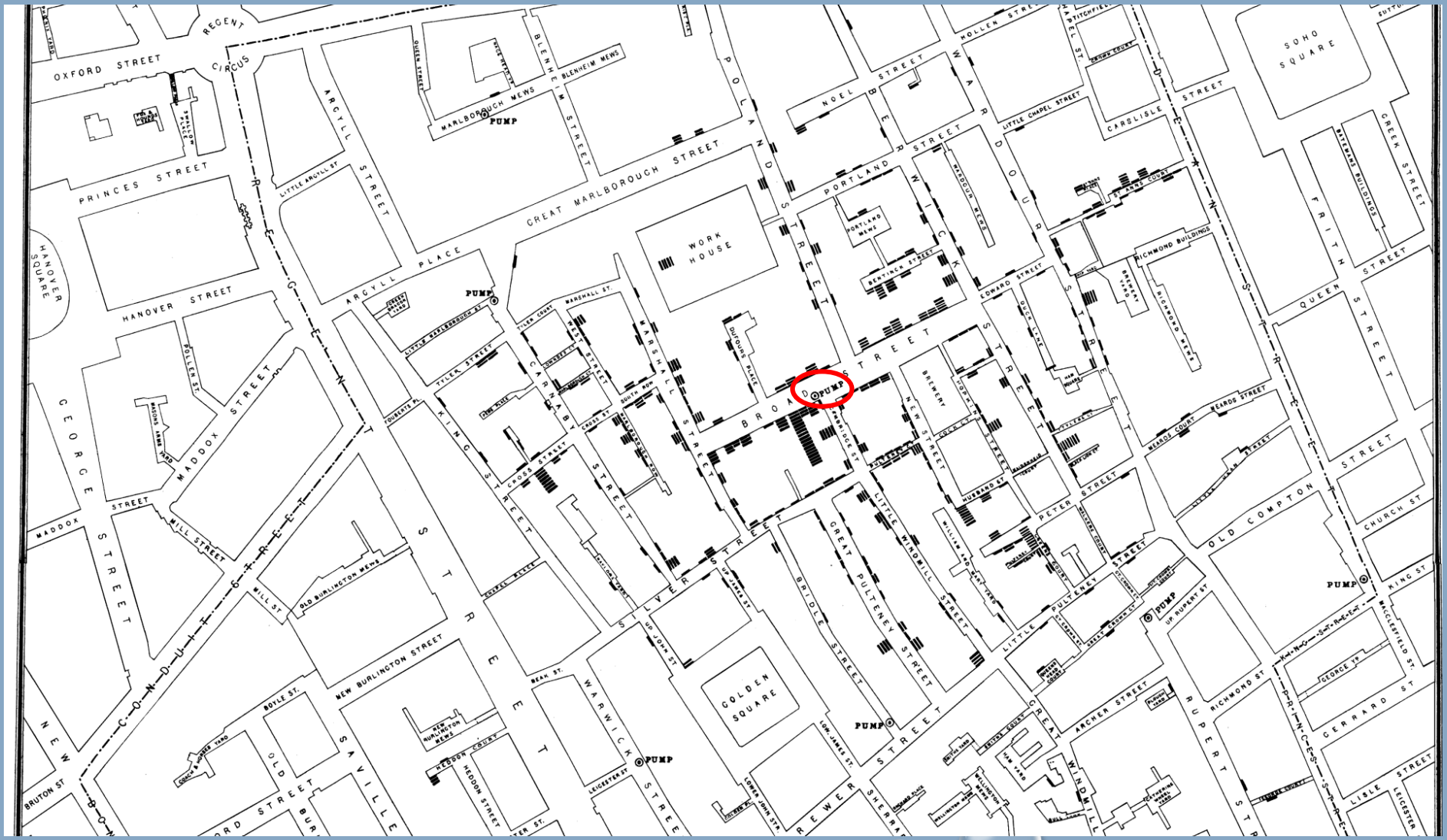
Pressure Zone, example 1



SAMPLE SITING – MULTIPLE BUILDINGS



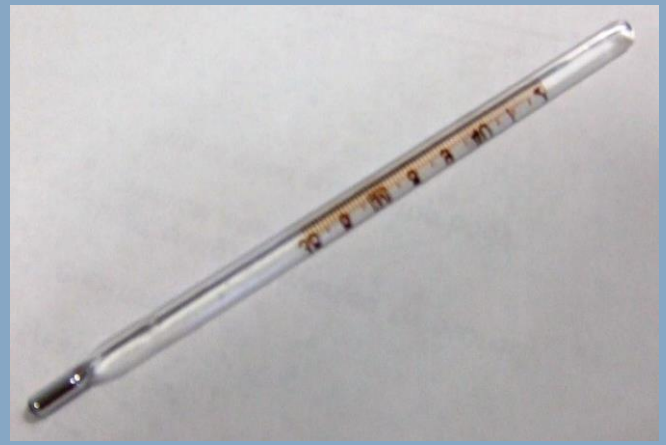
SAMPLE SITING (HISTORICAL PRECEDENT)



SAMPLING TECHNIQUE

- AWWA Guidance: https://www.youtube.com/watch?v=yyyk_M7ah3c
- Select sites representative of water in the entire distribution system.
- Assemble supplies, including good, clean, sample bottles
- If the system chlorinates, make sure to have a chorine residual test kit.

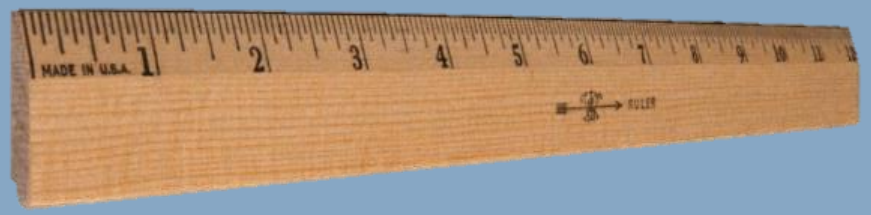
SAMPLING TECHNIQUE



- Make sure the sample tap is in good working order, no attachments, no outdoor hose bibs.
- Disinfect faucet/tap.
- Run the COLD water 5-10 minutes to clear the internal plumbing and service lines – consider using a thermometer to identify when the temperature stabilizes.

SAMPLING TECHNIQUE

- While the water is running, complete the lab forms and associated paperwork.
- Adjust the flow down to 1/8-inch, about the width of a pencil.



- Remove the sample bottle cap, keep it away from the running water and pointed down.

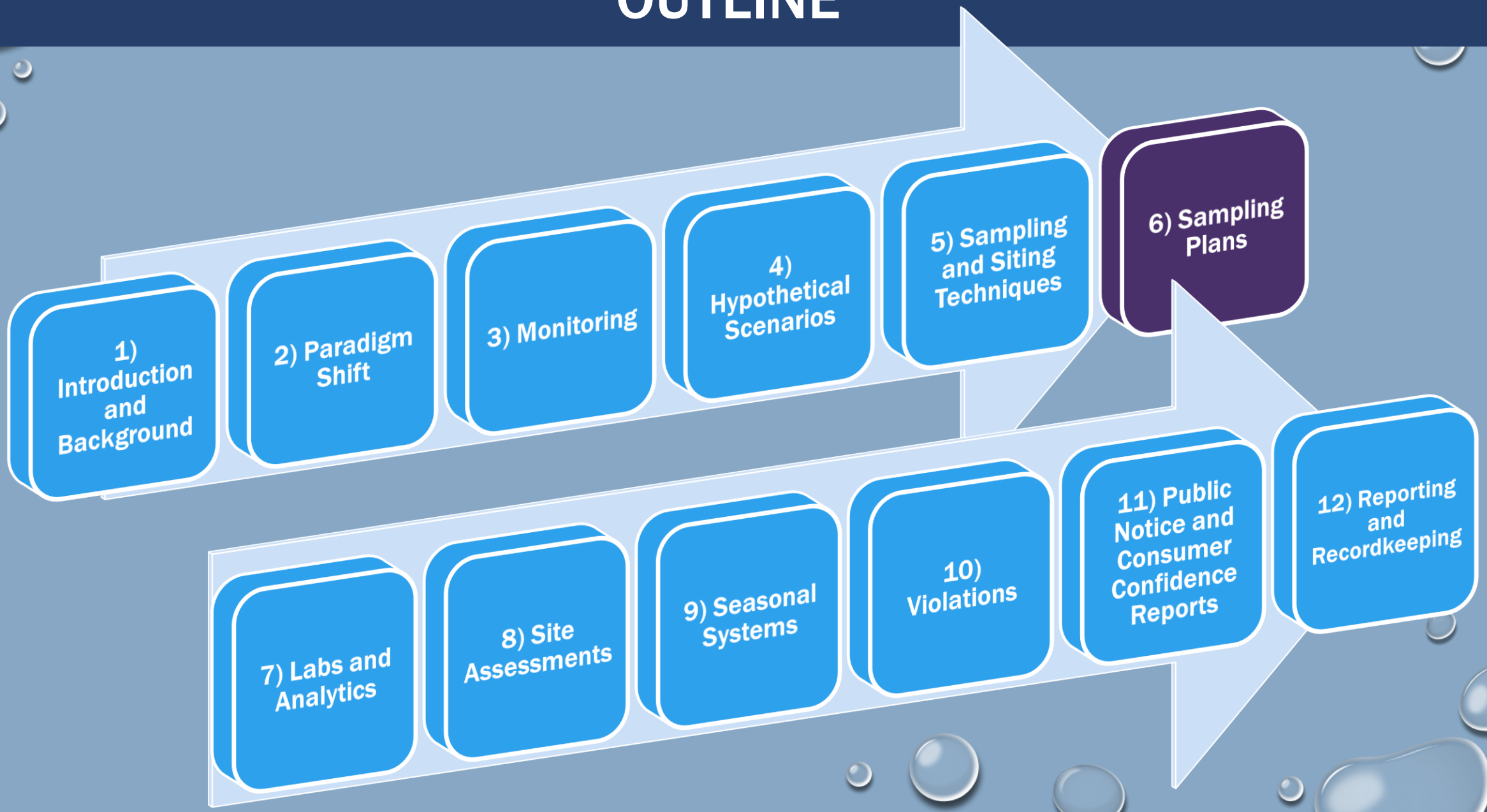
SAMPLING TECHNIQUE

- Do not rinse the bottle, do not remove preservative/dechlorinating agent in the bottle.
- Fill the bottle to the neck. Need to leave some space, but make sure to have enough (at least 100 mL) volume to be analyzed.
- Once full, replace the cap.
- Put the bottle into a cooler, refrigerator, or on ice.
- Should be kept between 0 and 10° C

SAMPLING TECHNIQUE

- If chlorinating, take a chlorine residual from the tap, write it on the lab paperwork.
- Turn off the tap and re-connect any aerators or accessories.
- Make sure laboratory form is filled out completely and correctly.
- Coolers used to transport samples should be cleaned daily.
- Get sample(s) to the lab within **24 hours** of collection.
- Sample early in the week and early in the monitoring period.

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

STEP 1: FINDING THE FORM

GO TO: WWW.DRINKINGWATER.VT.GOV

Drinking Water Systems
Property / Business Owners & Residents
Land-Based Disposal systems
Wastewater Disposal
Certification/Licensing
e-DEC
Fees
Environmental Notices
Funding
Groundwater Reclassification
Groundwater Withdrawal
Contact Us
Wastewater Permits Searchable Database
Well Completion Reports Searchable Database
ANR Internet Mapping Page

dec home > dwgwpd home

Welcome to the

Drinking Water and Groundwater Protection Division

What's New?

» Welcome to the new DWGWPD site. We will be continuing to update content. Thank you for your patience.

In the fall of 2011, the Water Supply Division and parts of the Wastewater Management Division merged to become the Drinking Water & Groundwater Protection Division (DWGWPD). The Division's central office is located in the National Life Building in Montpelier, and there is also staff located in five regional offices.

Regulatory programs managed by the Division include, but are not limited to:
Public Drinking Water Supply
Groundwater Withdrawal (water)
Wastewater System and Potable Water Supply (Regional Offices – drinking water and wastewater)
Indirect Discharge (wastewater)
Underground Injection Control (wastewater)

The Division also certifies/licenses:
Public Drinking Water System Operators
Wastewater & Potable Water Supply Designers
Well Drillers

The above programs all have compliance and enforcement components as well as permit issuance responsibilities. The Division, along with State-approved regional and national organizations, provides technical assistance and educational opportunities to water system operators and site designers. The Division supports and/or co-sponsors training opportunities that enhance the technical abilities of our regulated communities, as well as, our own staff.

Within these pages you will find the rules and regulations under which each program regulates activities, applicable applications, forms, guidance, practices, procedures, information about the training opportunities for the individuals we license, lists of those individuals, and other related links.

Contacting the DWGWPD

Please go to the Staff and Location page to find a map for our regional offices. The map will link to information about the Barre, Essex Junction, Rutland, Springfield, and St. Johnsbury offices. Our main office is in Montpelier.

If you wish to contact Drinking Water and Groundwater Protection Division staff please call the numbers as listed or send an email to staff. You may also contact us by leaving a message on our main line at: 1-800-823-6500 in-state or 802-828-1535. Voice messages left on the main line are checked daily. The fax number for the Montpelier office is: 802-828-1541.

If you wish to meet with staff at the National Life building please call ahead to arrange a time, so staff can greet you in the lobby. All visitors are required to sign in and obtain a visitor's badge.

U.S Mail:
Drinking Water and Groundwater Protection Division
Vermont Department of Environmental Conservation
Agency of Natural Resources
1 National Life Drive (Main Building- Floor 2)
Montpelier, VT 05620-3521

IN THE EVENT OF A SYSTEM EMERGENCY:
For After-Hours Water System Emergencies: Dial 741-5311 - *then enter your phone number (a local call within Vermont for a 24-hour pager for Drinking Water and Groundwater Protection Division emergency response).*

A Vermont Government Website Copyright 2004 State of Vermont - All rights reserved

FINDING THE FORM

WWW.DRINKINGWATER.VT.GOV

Public Water Systems - Applications & Forms

Applications

Consecutive System Exemption Application
Operating Permit Application

Source Water Permit Applications
PCWS
NTNC
TNC
Domestic Bottled and Bulk
Source Testing Review

Certified Operator Application (Class 2, 3, 4 & D)
Statement regarding Child Support and VT Taxes
Certified Operator Renewal application (Class 2, 3, 4 & D)
Avoidance of Filtration for Surface Water and GWUDI of Surface Water
Certification of Water Source Likely Affected by Agricultural Lands
GWUDI Exemption Application & Guidance
Phase II/V Monitoring Waiver Application
Renewal Application
Construction Permit Application

Forms

Water System Officials Contact Form
Public Water Supply Survey Form
Public Notice Certification Form
Lead and Copper Sampling Plan
Lead and Copper Sampling Plan Guidance
Bacteriological Sampling Plan & Guidance Less than 1000 Population
Bacteriological Sampling Plan & Guidance Greater than 1000 Population
Bulk Water Hauling as an Emergency Form and Guidance
Monthly Operations Report for Filtered Surface Water Systems
Letter and Instructions for Filtered Surface Water Reporting
Monthly Operations Report for Groundwater and Systems Purchasing Groundwater

Boil Water Notice Forms
Issuing and Rescinding a Boil Water Notice
Boil Water Notice Template for general use
Boil Water Notice Acute (*E. coli*) MCL template and Instructions
Boil Water Notice Non- Acute MCL Template and Instructions

Non-Boil Water Notice Forms
MCL Violation Non-Boil Template and Instructions
Corrective Action Guidance
Tier 3 Public Notice Form & Guidance

Tools
O&M Manual
Template
Guidance for template

STEP 2: BASIC SYSTEM INFO

System Information		
System Name:	**WSID Number:**	**System Type** (check one): ☐ TNC ☐ NTNC ☐ Community
# of Service Connections:	**Source Water Type** (check one): ☐ Groundwater ☐ Surface Water/GWUDI ☐ Consecutive	
System Population:	**# of Pressure Zones:**	
Dates of Operation (*SEASONAL SYSTEMS ONLY*): **Open:** _____ **Close:** _____		
Number of Distribution Systems (check one): ☐ 1 ☐ 2 ☐ 3 ☐ **more than 3.** If the system has more than one distribution system, identify the distribution system to which this form pertai DS00_____		

is for completion: This form is designe
of 1,000 or less. For systems with multiple
equired. Attach a map to this plan. The m
early labeled coliform sampling locations
locations (if the system uses groundwater)
r system infrastructure such as: all source
distribution lines. If the system consists

STEP 4: COMPLETE SAMPLE LOCATIONS AND JUSTIFICATION

	Routine Location Address	Justification	5 Connections Upstream For repeat locations Numbers 2 – 5 are optional	5 Connections Downstream For repeat locations Numbers 2 – 5 are optional
1	Routine Location 1 (Base): _____		1	1
			2	2
			3	3
			4	4
			5	5
7	Routine Location 7: _____		1	1
			2	2
			3	3
			4	4
			5	5

Instructions: The locations for all routine samples taken for compliance purposes must be identified in this table. 1) List up to 7 routine monitoring locations. These are the locations where the required routine compliance samples (monthly or quarterly) are collected. If possible, list the 911 addresses for each location. If those addresses are not available, list where the samples are taken. 2) Explain why the system chooses to sample at each location under the "Justification" column. 3) List at least one and up to five repeat samples within 5 connections upstream and 5 connections downstream for each Routine sampling location listed.

STEP 5: SAMPLE SCHEDULE AND SOURCE INFORMATION

Fill out sample schedule

Table 2 – Quarterly Monitoring

To be completed only by **year-round NTNC and TNC systems using groundwater**. Systems must alternate between the Routine 1 (Base) location and at least one other Routine location as identified on the previous page, depending on system complexity. Identify in what quarter each Routine sample location will be sampled.

Quarter	Routine Sampling Location
1st: January 1 through March 31	
2nd: April 1 through June 30	
3rd: July 1 through September 30	
4th: October 1 through December 31	

Table 3 – Monthly Monitoring

To be completed by any **public water system serving 1,000 people or less**. Systems must alternate between the Routine 1 (Base) location and at least one other Routine location as identified on the previous page, depending on system complexity. Identify in what month each Routine sample location will be sampled.

Month	Routine Sampling Location
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

Table 4 – Source Information

Provide the names/numbers of groundwater sources (wells, springs, etc.) and the source sample tap location at which each source may be sampled **prior to any treatment**. If a raw water sampling tap is not available prior to the first user, identify the first tap/faucet closest to where the water enters the system.
Attach additional sheets if necessary

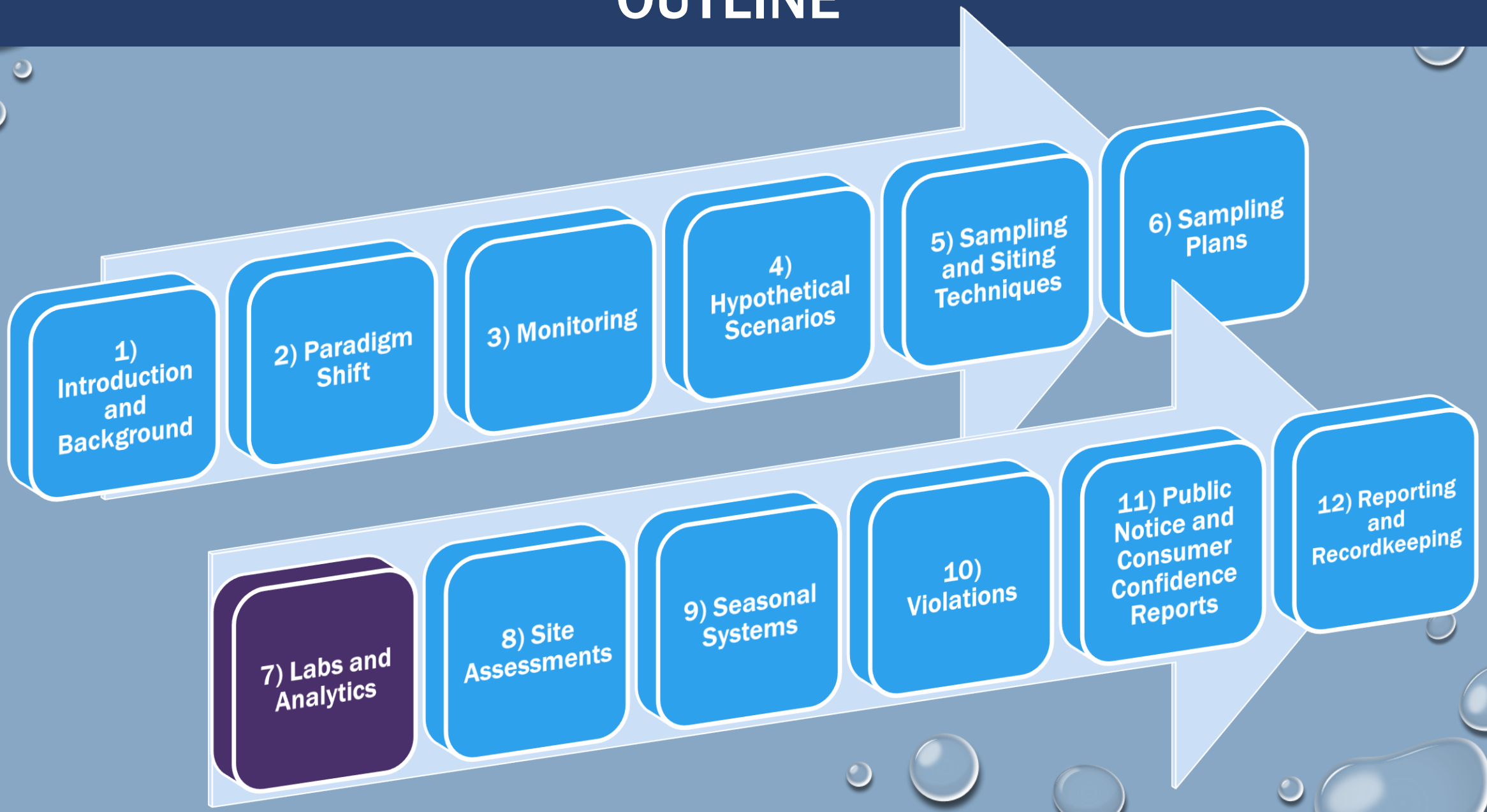
Source Name/Number	Source Sample Tap Location	Is this a combined source sample location?
Source 1:		
Source 2 (if applicable):		
Source 3 (if applicable):		
Source 4 (if applicable):		

Revised 8/20/2015 3

Fill out source information (Groundwater systems only)

Don't forget to sign the form!

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

ANALYTICAL AND LABORATORY METHODS

- Samples must be analyzed by a VT Department of Health certified drinking water lab
- List of Laboratories certified for drinking water analysis: http://healthvermont.gov/enviro/ph_lab/water_test.aspx
- Labs must be certified for each method used for analysis & each contaminant analyze

ANALYTICAL REQUIREMENTS

- Standard sample volume required for analysis:

  100 mL – Regardless of analytical method

- Only required to determine the presence or absence of total coliform & *E. coli.*
- The time from sample collection to initiation of test medium incubation: May not exceed 30 hours
- Sodium thiosulfate will typically be included by the lab to neutralize the chlorine in the water sample.

TOTAL COLIFORM ANALYTICAL METHODS

Methodology Category	Methods
Lactose Fermentation Methods	• Standard Methods 9221B - Standard Total Coliform Fermentation Technique • Standard Methods 9221D - Presence-Absence (P–A) Coliform Test
Membrane Filtration Methods	• Standard Methods 9222B – Standard Total Coliform Membrane Filter Procedure • MI medium • m-ColiBlue24® Test • Chromocult
Enzyme Substrate Methods	• Colilert® - VT LABS • Colisure® • E*Colite® Test • Readycult® Test • Modified Colitag® Test

E. COLI ANALYTICAL METHODS

Methodology Category	Methods
Escherichia coli Procedure (following Lactose Fermentation Methods)	• Standard Methods 9221 F - EC–MUG medium
Escherichia coli Partition Method	• Standard Methods 9222G - EC broth with MUG (EC–MUG) • Standard Methods 9222G - NA–MUG medium
Membrane Filtration Methods	• MI medium • m-ColiBlue24® Test • Chromocult
Enzyme Substrate Methods	• Colilert® - VT LABS • Colisure® • E*Colite® Test • Readycult® Test • Modified Colitag® Test

REJECTION OF SAMPLES

BR – Broken

CL – Chlorine Present

EH - Exceeds hold Time

HS – Excessive head space

FZ – Frozen sample

IN – Insufficient Information

VO – Insufficient Volume

LA – Lab accident

LT – Leak in transit

IP – Invalid sampling protocol

When notified by lab: Collect replacement sample within 24 hours

TCR SAMPLE COLLECTION FORM

Mark the type of compliance sample on form for lab:

- Routine (RT):
  - Sample(s) required by monitoring schedule.
  - Additional Routine (NTNCs and TNCs on quarterly only) 3 samples the following month after TC+ Routine sample.
- Repeat (RP): Samples required immediately after TC+ Routine sample.
- Trigger Source (TG): Ground water source sample required immediately after TC+ Routine sample.

*NOTE – If sample is marked "Special" or "Other" it will not be used for compliance purposes (SP)!

TC SAMPLE COLLECTION FORM (CONT.)

Mark sample location information on lab form:

- Facility ID – DS001. DS002, etc. for systems with multiple distribution
- Sample Point ID – TC001. TC002, etc for samples from with multiple distributions
- Sample location – “911 Address” & location where took sample. Example: 103 Main St., Kitchen

TCR SAMPLE COLLECTION FORM (CONT.)

- Sample location information is on the system's monitoring schedule:

Paper

COLIFORM BACTERIA MONITORING

Sampling Locations	Facility ID	Facility Name	Sample Point ID	Description
	DS001	DIST SYSTEM-BROOKWELL (UNITS 1-	TC001	
	DS002	DIST SYSTEM-ROAD WELL (UNITS 32	TC002	

Analyte/Group Name	Monitoring Period	Monitoring Frequency
COLIFORM BACTERIA	1/1 - 12/31	2 every Month

Web

COLIFORM BACTERIA

Facility ID	Facility Name	Sample Point
DS001	DISTRIBUTION SYSTEM	TC001
DS002	DISTRIBUTION SYSTEM	TC002

Analyte	Monitoring Period	Start - End Date	Sample #
COLIFORM (TCR)	1/1 - 12/31	7/1/2015 -	2 per QT

QT- Quarter YR - Year
MN - Month DL - Day
1T - One Time Only

TCR & GWR SAMPLE TYPE, FACILITY ID & SAMPLE POINT ID

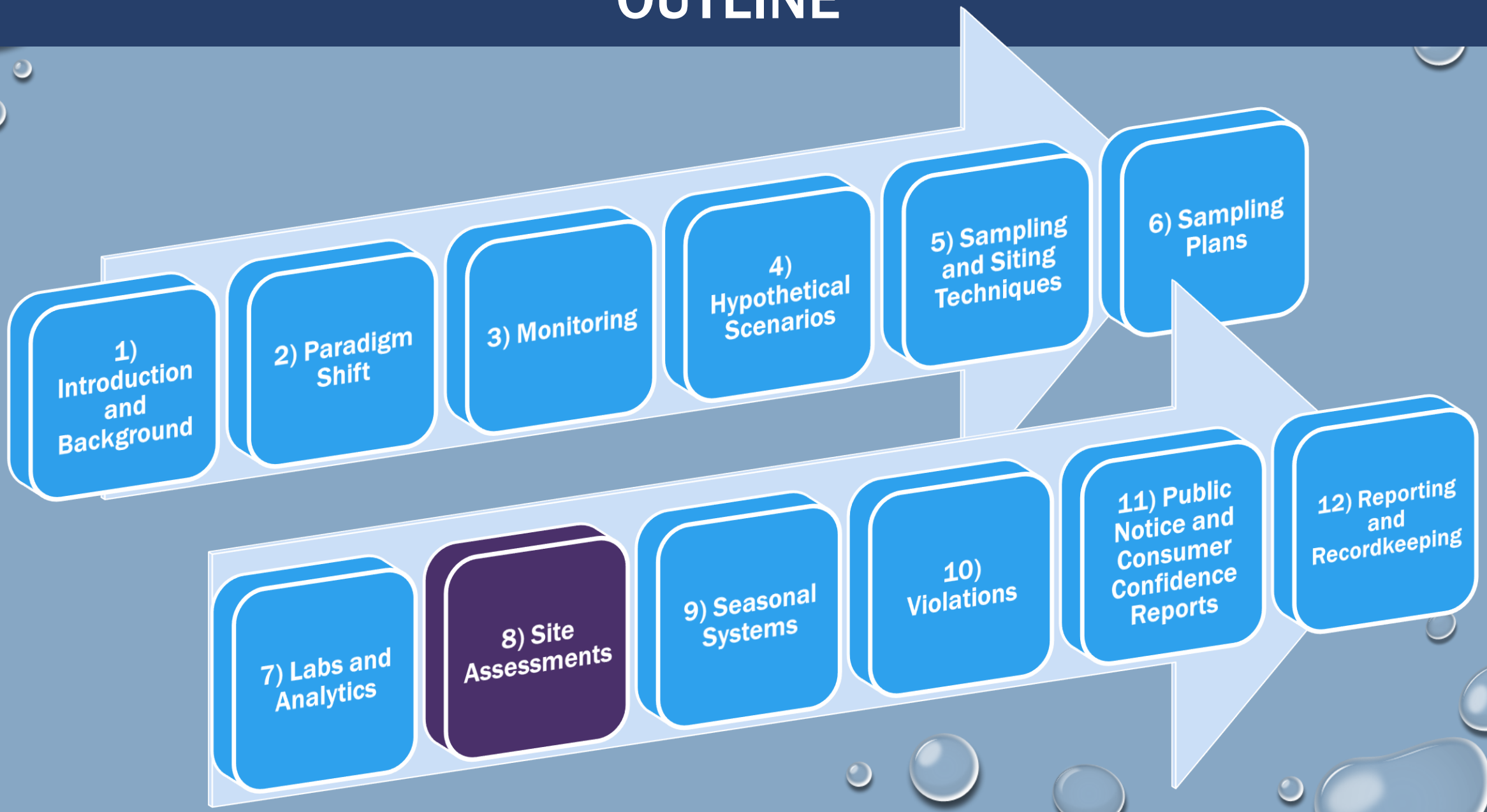
Sample Type	Facility ID	Sample PT ID	Sample Location Description
Routine, Distribution (RT)*	DS001, DS002..etc.	TC001, TC002..etc.	**Specific Address/Name for sample location**
Repeat, Distribution (RP)*	DS001, DS002..etc.	TC001, TC002..etc.	
Trigger, Source (TG)** **-Groundwater systems**	WL001, WL002..etc.	RW001, RW002..etc.	
Replacement Routine, Repeat or Trigger Source	**See above, same as original sample.**		
Special (SP)	**See above for "Special" distribution or source sample**		

*** TCR = Total Coliform Rule** **** GWR = Groundwater Rule**

EXPEDITED MONITORING RESULTS NOTIFICATION

- PWS Responsibility – Ensure that samples are collected on schedule & analyzed by certified laboratory within the regulatory timeframe.
- Know the notification timeframes and procedures from the certified laboratory to the PWS
- PWS are encouraged to include language in contractual agreements with the lab that sets deadlines for notification: notify the PWS within 24 hours of any positive result (TC, E.coli) and method by which notification must occur.

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

SITE ASSESSMENTS UNDER THE RTCR

Level 1 Site Assessment

- 2 or more TC+ samples in a month
- Failure to take EVERY repeat sample following TC+ Routine sample

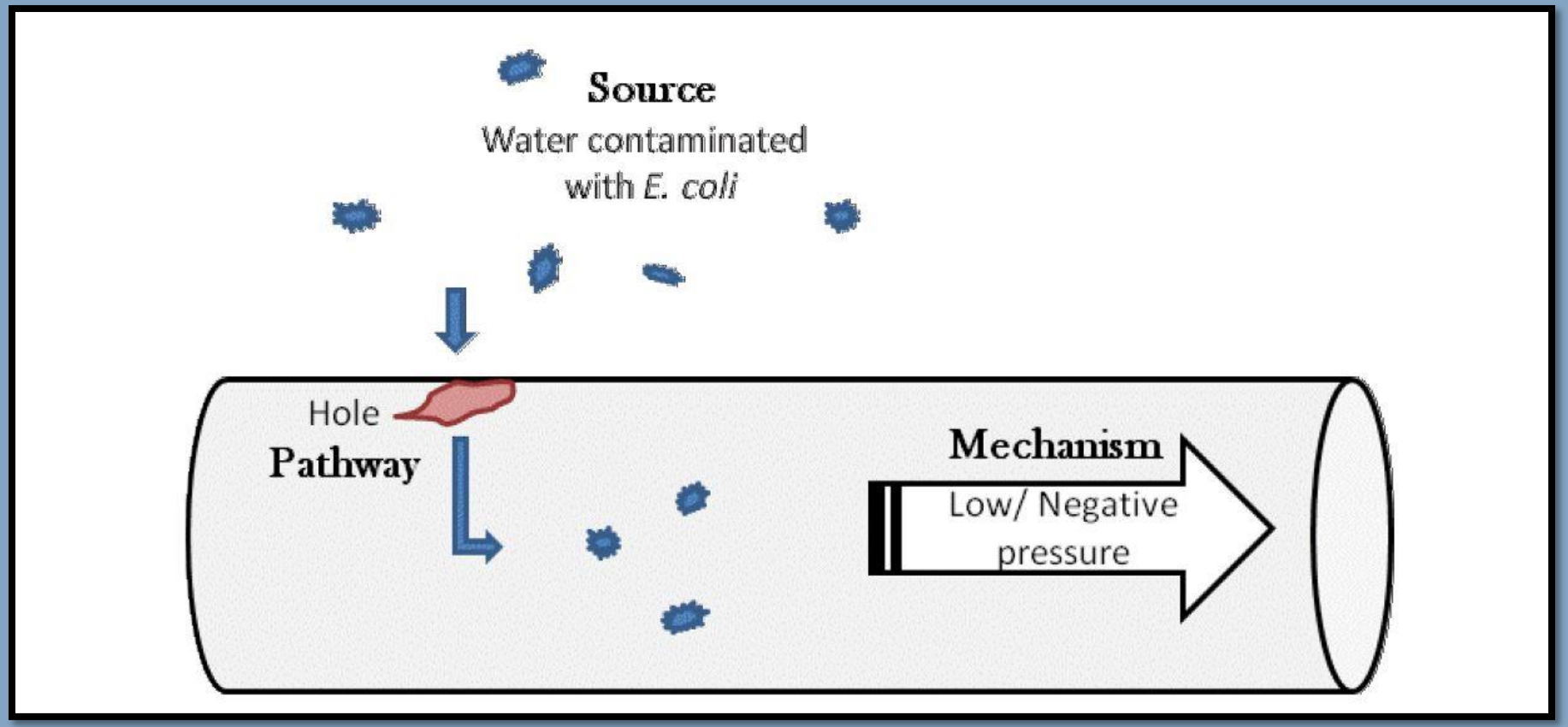
Level 2 Site Assessment

- E. coli MCL
- Second Level 1 trigger in 12 months

CAUSES OF CONTAMINATION

- Bacteria may be present in the distribution if the following simultaneously occur:
  1. **Source** of bacteria
  2. **Pathway** into the distribution system or breach in system integrity
  3. **Mechanism** that allows bacteria to be carried on this pathway or that allows bacteria within biofilms, corrosion tubercles, or sediment to break free and enter the water.

CAUSES OF CONTAMINATION



CORRECTIVE ACTIONS

- Correct <u>all</u> sanitary defects found during the assessment.
- Within 30 days of triggering the assessment:
  - Complete Assessment & form
  - Submit assessment form
  - Correct Defects
- If the system needs more time, propose a schedule to State.

The State determines if the assessments and schedules are sufficient

CORRECTIVE ACTIONS

- Must be permanent or be able to be made permanent under a schedule.
- Must follow industry best management practices.
- Must meet the construction and operation standards of the Water Supply Rule.

LEVEL 1 SITE ASSESSMENTS

1. Level 1 Site Assessment trigger:
   a) Two or more TC + samples in a month; or
   b) System fails to take EVERY required repeat sample following at TC + routine sample.

Resulting in a Level 1 Site Assessment to be performed within 30 days of the trigger

Level 1 Site Assessments can be performed by any validly-certified drinking water system operator with the same class certification as the water system or greater.

COMPLETED LEVEL 1 ASSESSMENT FORM

For Division Use Only: Reviewer_____ Date Reviewed_____

VERMONT ENVIRONMENTAL CONSERVATION

Drinking Water and Groundwater Protection Division

Level 1 Assessment Form

Completion and submittal of this form is required following two or more positive total coliform samples within one month or when an inadequate number of repeat samples are collected after a routine total coliform positive sample

System Information

System Name: ABC Water System | WSID #: 12345 | Class of System: 1A 1B (2) 3 4 4A1 4A 4B 4C D (circle one)

Date of Assessment: 6/25/15 | Type of Water System (circle one): TNC / Community / (NTNC)

Instructions

This form must be completed and submitted within 30 days of learning of the requirement to perform the Level 1 Assessment.

Review Sections 1 - 6 below. Answer every question that applies to the water system by circling "Y" for yes or "N" for no. If a specific question is not applicable to the water system, circle "NA" for that question. If an entire section does not apply to the water system (such as if the system does not have treatment or storage facilities), circle "NA" in the gray section heading bar. Please then fill out Sections 7, 8, and 9 completely.

In order for this form to be complete, it must be signed and dated.

Section 1: Changes or Events — NA

a)	NA	(Y) / N	lower disinfectant residual than expected	g) NA	Y / (N) water quality parameters out of range
b)	NA	(Y) / N	changes, different/abnormal operational activity	h) NA	Y / (N) new source added, emergency supply used
c)	NA	Y / (N)	firefighting event/hydrant flushing	i) NA	Y / (N) flooding: source(s) or distribution system
d)	NA	Y / (N)	signs of vandalism/forced entry	j) NA	Y / (N) visible indicators of unsanitary conditions
e)	(NA)	Y / N	rapid snowmelt	k) NA	Y / (N) low (< 20 psi) or loss of distribution system pressure
f)	NA	Y / (N)	heavy rainfall	l) NA	Y / N other _____

Section 2: Sampling Site(s)/Protocol

a)	NA	Y / (N)	unclean or unsuitable sample tap	f) NA	Y / (N) inadequate tap flushing
b)	NA	Y / (N)	hot water intrusion	g) NA	Y / (N) auto sensing faucet/swivel-type faucet
c)	NA	Y / (N)	change in conditions at sample site	h) NA	Y / (N) improper hold time/storage temperature
d)	NA	Y / (N)	improper sample container	i) NA	Y / (N) sampler error
e)	NA	Y / (N)	aerator was not removed	j) NA	Y / (N) other _____

Section 3: Source(s)

Drilled/Bedrock Wells

a)	NA	Y / (N)	potential source of contamination	f) NA	Y / (N) damaged or compromised well casing
b)	NA	Y / (N)	defective/damaged/loose well cap/well seal	g) NA	Y / (N) damaged or unscreened vent
c)	NA	Y / (N)	well/pump failure (quantity concerns)	h) NA	Y / (N) unprotected opening in pump assembly
d)	NA	Y / (N)	damaged pitless adaptor	i) NA	Y / (N) source overflow construction
e)	NA	Y / (N)	damaged electrical conduit	j) NA	Y / (N) other _____

Springs or Dug Wells				Surface Water			
a)	(NA)	Y / N	potential source of contamination	a)	(NA)	Y / N	potential source of contamination
b)	(NA)	Y / N	infiltration of surface run-off	b)	(NA)	Y / N	recent storm event
c)	(NA)	Y / N	condition of spring box or well construction	c)	(NA)	Y / N	infiltration
d)	(NA)	Y / N	source overflow construction	d)	(NA)	Y / N	atypical source water quality
e)	(NA)	Y / N	other _____	e)	(NA)	Y / N	other _____

Consecutive Connections

a)	(NA)	Y / N	flooded valve/meter vault	d)	(NA)	Y / N	atypical pressure/flow from wholesaler
b)	(NA)	Y / N	damaged interconnection	e)	(NA)	Y / N	lower incoming disinfectant residual than expected
c)	(NA)	Y / N	inadequate backflow protection	f)	(NA)	Y / N	other _____

Section 4: Treatment Process(es) — NA

a)	NA	Y / (N)	change in flow rates	e) NA	Y / (N) interruption in treatment or power loss
b)	NA	Y / (N)	inadequate disinfection or treatment	f) NA	Y / (N) recent installation or repair of treatment equipment
c)	NA	Y / (N)	turbidity measurements out of range	g) NA	Y / (N) treatment added or changed
d)	NA	Y / (N)	operation and maintenance procedures not followed	h) NA	Y / (N) malfunctioning treatment equipment
				g) NA	Y / (N) other _____

Rev 07/24/2015 Page 1 of 2

Section 5: Storage Tank(s) — (NA)

a)	NA	Y / N	improper maintenance practices	f) NA	Y / N torn vent/overflow screens
b)	NA	Y / N	presence of dead animals or insects	g) NA	Y / N lower disinfectant residual than expected
c)	NA	Y / N	cover/access hatch not sealed	h) NA	Y / N signs of vandalism or forced entry
d)	NA	Y / N	incorrect operation of level control valves	i) NA	Y / N deterioration, rust, holes, or other breaches
e)	NA	Y / N	vent/overflow construction inadequate	j) NA	Y / N other _____

Section 6: Distribution — NA

a)	NA	Y / (N)	power loss (pump station)	j) NA	Y / (N) operation of valves resulting in equipment breakage
b)	NA	Y / (N)	standing water/debris in valve vault	k) NA	Y / (N) operation of air-relief/vacuum valves
c)	NA	(Y) / N	low disinfection residual	l) NA	Y / (N) improper operation of pumps
d)	NA	Y / (N)	pump or valve failure	m) NA	Y / (N) illegal or unauthorized use of hydrants
e)	NA	Y / (N)	improper surge control	n) NA	Y / (N) inadequate distribution system pressure
f)	NA	Y / (N)	main breaks or leaks	o) NA	Y / (N) backflow/cross-connection event
g)	NA	Y / (N)	unprotected cross connection	p) NA	(Y) / N plumbing/piping modifications/improvements
h)	NA	Y / (N)	improper operation of valves	q) NA	Y / N other _____
i)	NA	Y / (N)	waterlogged pressure/bladder tanks		

Section 7: Written Description of Sanitary Defect(s) that were Circled Above

This space must be filled out. Use this space to expand upon and provide additional information that supports the findings identified in Sections 1 - 6 above.

Explain those defects that are circled above. If no sanitary defects were identified, you must state so below.

Prior to taking routine sample, Facility staff replaced bladder tanks. No shocking or disinfection occurred. Also, detected lower than normal chlorine residual in distribution.

REQUIRED

Section 8: Corrective Action(s) and Proposed Timetable

Use the space below to describe the corrective action(s) taken and the date(s) completed. If the water system requires additional time to complete the corrective action(s), provide the proposed improvement timetable below.

Water system management and/or owners must be made aware of the proposed timetable of improvement(s).

6/24/15 - Shocked and flushed entire system. Increased chlorine feed rate. Will continue to monitor chlorine residuals and will respond accordingly. Took a SP sample as follow-up and it was clean.

Section 9: Certification

Print Name: First Last | Title: Operator

Signature: _____ | Date: 6/26/15

☒ Certified Water System Operator | ☐ DWGWP Staff

(circle one) Class 1A 1B 2 (3) 4A1 4A 4B 4C D

I certify that I am the person authorized to fill out this form and that the information contained herein is true, accurate, and complete to the best of my knowledge and ability at the time the assessment was performed.

RETURN TO

TCR Rule Coordinator
Drinking Water and Groundwater Protection Division
One National Life Drive - Main 2
Montpelier, VT 05620-3521
Fax: 802-828-1541

Complete this form and submit it to the Division within 30 days of learning of the requirement to perform the Level 1 assessment.

Rev 07/24/2015 Page 2 of 2

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 3: Source(s)

Drilled/Bedrock Wells

a)	NA	Y / N	potential source of contamination	f)	NA	Y / N	damaged or compromised well casing
b)	NA	Y / N	defective/damaged/loose well cap/well seal	g)	NA	Y / N	damaged or unscreened vent
c)	NA	Y / N	well/pump failure (quantity concerns)	h)	NA	Y / N	unprotected opening in pump assembly
d)	NA	Y / N	damaged pitless adaptor	i)	NA	Y / N	source overflow construction
e)	NA	Y / N	damaged electrical conduit	j)	NA	Y / N	other _____

Springs or Dug Wells

a)	NA	Y / N	potential source of contamination
b)	NA	Y / N	infiltration of surface run-off
c)	NA	Y / N	condition of spring box or well construction
d)	NA	Y / N	source overflow construction
e)	NA	Y / N	other _____

Surface Water

a)	NA	Y / N	potential source of contamination
b)	NA	Y / N	recent storm event
c)	NA	Y / N	Infiltration
d)	NA	Y / N	atypical source water quality
e)	NA	Y / N	other _____

Consecutive Connections

a)	NA	Y / N	flooded valve/meter vault	d)	NA	Y / N	atypical pressure/flow from wholesaler
b)	NA	Y / N	damaged interconnection	e)	NA	Y / N	lower incoming disinfectant residual than ex
c)	NA	Y / N	inadequate backflow protection	f)	NA	Y / N	other _____

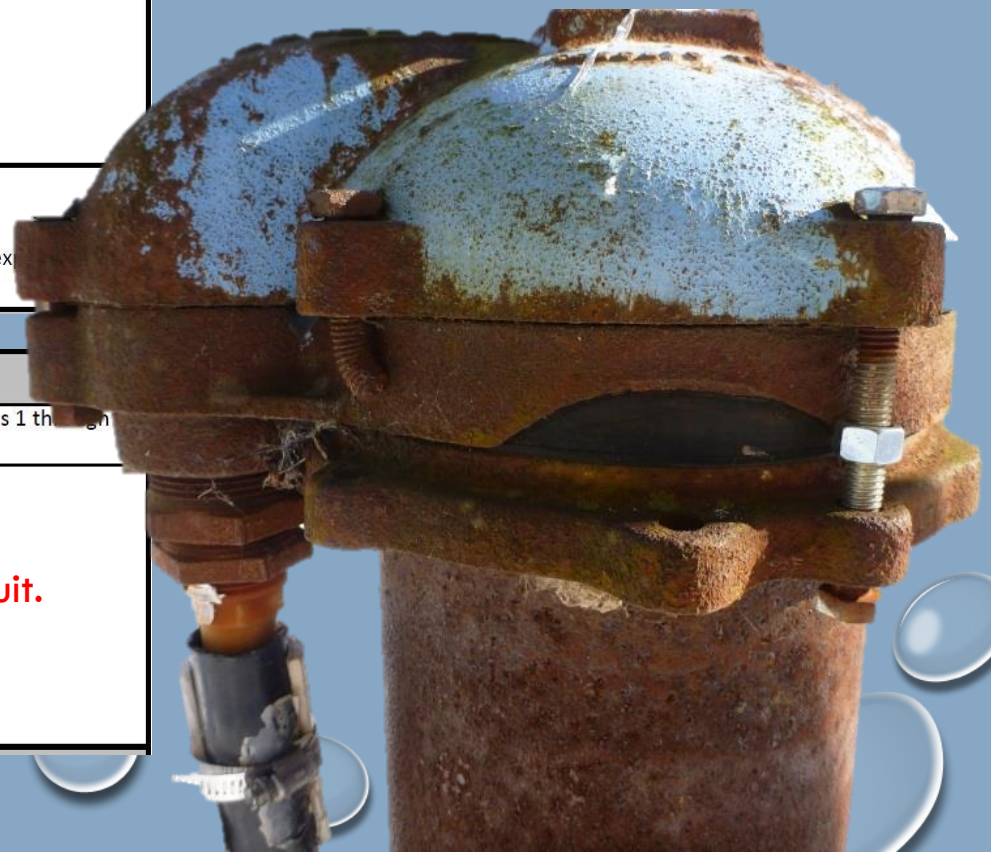
Section 7: Written Description of Sanitary Defect(s) that were Circled Above

This space must be filled out. Use this space to expand upon and provide additional information that supports the findings identified in Sections 1 th gh above.

Explain those defects that are circled above. If no sanitary defects were identified, you must state so below.

Well cap is cracked, missing bolts, loose bolts. Cracked electrical conduit.

REQUIRED



LEVEL 1 ASSESSMENT COMPLETION

Section 8: Corrective Action(s) and Proposed Timetable
Use the space below to describe the corrective action(s) taken and the date(s) completed. If the water system requires additional time to complete the corrective action(s), provide the proposed improvement timetable below. **Water system management and/or owners must be made aware of the proposed timetable of improvement(s).**
4/15/2015 Replaced cap with modern sanitary cap. Replaced conduit with new parts and installed a frost sleeve.

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 5: Storage Tank(s)								NA
a)	NA	Y / N	improper maintenance practices	f)	NA	Y / N	torn vent/overflow screens	
b)	NA	Y / N	presence of dead animals or insects	g)	NA	Y / N	lower disinfectant residual than expected	
c)	NA	Y / N	cover/access hatch not sealed	h)	NA	Y / N	signs of vandalism or forced entry	
d)	NA	Y / N	incorrect operation of level control valves	i)	NA	Y / N	deterioration, rust, holes, or other breaches	
e)	NA	Y / N	vent/overflow construction inadequate	j)	NA	Y / N	other _____	

Section 7: Written Description of Sanitary Defect(s) that were Circled Above

This space must be filled out. Use this space to expand upon and provide additional information that supports the findings identified in Sections 1 through 6 above.

Explain those defects that are circled above. If no sanitary defects were identified, you must state so below.

Storage tank level control probe penetrations not sealed. Evidence of rodent and insect activity in vault.

REQUIRED

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 8: Corrective Action(s) and Proposed Timetable
Use the space below to describe the corrective action(s) taken and the date(s) completed. If the water system requires additional time to complete the corrective action(s), provide the proposed improvement timetable below. **Water system management and/or owners must be made aware of the proposed timetable of improvement(s).**
7/10/2015 – Install watertight and sanitary conduit and fittings. Sealed extra penetration. Performed shock disinfection of storage tank and flushed via distribution system.

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 2: Sampling Site(s)/Protocol							
a)	NA	Y / N	unclean or unsuitable sample tap	f)	NA	Y / N	inadequate tap flushing
b)	NA	Y / N	hot water intrusion	g)	NA	Y / N	auto sensing faucet/swivel-type faucet
c)	NA	Y / N	change in conditions at sample site	h)	NA	Y / N	improper hold time/storage temperature
d)	NA	Y / N	improper sample container	i)	NA	Y / N	sampler error
e)	NA	Y / N	aerator was not removed	j)	NA	Y / N	other _____

Section 7: Written Description of Sanitary Defect(s) that were Circled Above
This space must be filled out. Use this space to expand upon and provide additional information that supports the findings identified in Sections 1 through 6 above.
Explain those defects that are circled above. If no sanitary defects were identified, you must state so below.
Used unsuitable sample tap – tub faucet with mixing valve and internal shower valve.

REQUIRED

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 8: Corrective Action(s) and Proposed Timetable
Use the space below to describe the corrective action(s) taken and the date(s) completed. If the water system requires additional time to complete the corrective action(s), provide the proposed improvement timetable below. **Water system management and/or owners must be made aware of the proposed timetable of improvement(s).**
7/22/2015 Reviewed online resources for taking samples. Will no longer sample from a bathtub faucet. Will use only clean, non-mixing, non-swivel faucets with external threads for future sampling.

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 6: Distribution								NA
a)	NA	Y / N	power loss (pump station)	j)	NA	Y / N	operation of valves resulting in equipment breakage
b)	NA	Y / N	standing water/debris in valve vault	k)	NA	Y / N	operation of air-relief/vacuum valves
c)	NA	Y / N	low disinfection residual	l)	NA	Y / N	improper operation of pumps
d)	NA	Y / N	pump or valve failure	m)	NA	Y / N	illegal or unauthorized use of hydrants
e)	NA	Y / N	improper surge control	n)	NA	Y / N	Inadequate distribution system pressure
f)	NA	Y / N	main breaks or leaks	o)	NA	Y / N	backflow/cross-connection event
g)	NA	Y / N	unprotected cross connection	p)	NA	Y / N	plumbing/piping modifications/improvements
h)	NA	Y / N	improper operation of valves	q)	NA	Y / N	other _____
i)	NA	Y / N	waterlogged pressure/bladder tanks				

Section 7: Written Description of Sanitary Defect(s) that were Circled Above

This space must be filled out. Use this space to expand upon and provide additional information that supports the findings identified in Sections 1 through 6 above.

Explain those defects that are circled above. If no sanitary defects were identified, you must state so below.

REQUIRED

Identified a leak on Market Street near where the positive samples were located. Fixed the leak but have reason to believe there are other leaks on that main, further down due to lower than normal system pressure and increased production.

LEVEL 1 ASSESSMENT FORM COMPLETION

- Since this fix is going to take some time to complete fully, the system needs to request more time and propose a completion date.
- This proposed date will need to be approved by the state.

Section 8: Corrective Action(s) and Proposed Timetable
Use the space below to describe the corrective action(s) taken and the date(s) completed. If the water system requires additional time to complete the corrective action(s), provide the proposed improvement timetable below. **Water system management and/or owners must be made aware of the proposed timetable of improvement(s).**
July 29, fixed the initial leak then shocked and flushed the main. We need to trace this line and assess if another leak may be present. Pressure on the south side of town is lower than usual and system production is higher than normal for this time of year. We need additional time to find and fix the leak. We propose a completion date of September 1, 2015 for the repair.

INCORRECT LEVEL 1 ASSESSMENT FORMS

- Incomplete:
  - Unsigned, no WSID, no system name, no date, system type or operator classification
- Sanitary defects circled but not explained in section 7
- No completion date or proposed timeline for corrective action(s)

LEVEL 2 SITE ASSESSMENTS

2. Level 2 Site Assessment Trigger:
   a) E. coli MCL Violation:
   b) Second Level 1 assessment Trigger in 12 rolling months

RT	RP
TC +	EC +
EC +	TC +
EC +	No RP
EC+	TC+ EC not analyzed

Resulting in a Level 2 Site Assessment to be performed within 30 days of the trigger

Level 2 Site Assessments are more in-depth and must be performed by the state or a party approved by the state.

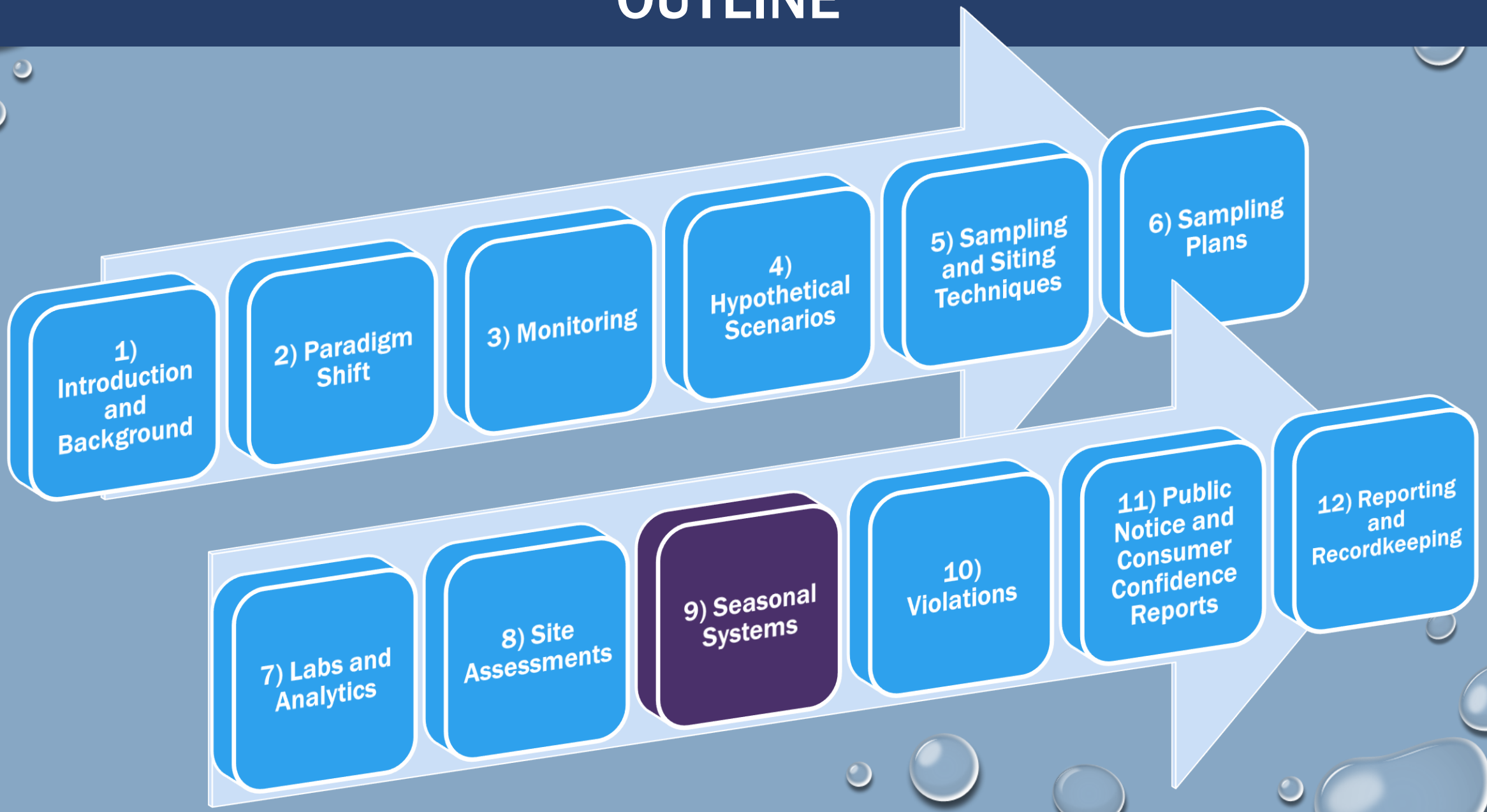
TRIGGERED SITE ASSESSMENTS SUMMARY

	Level 1 Site Assessment	Triggered Level 2 Site Assessment
Who	Certified operator of the same class or greater	State or party approved by the state (likely a contractor)
What	A 2 page form that walks through the system and identifies sanitary defects	A more complicated walk through, document review, and sample site analysis.
When	Within 30 days of the second TC+ in a month or after failing to take all repeat samples.	Within 30 days of triggering a second Level 1 assessment in 12 months or an EC MCL.
Why	Protection of Public Health, identify pathways or potential pathways of contamination.	

VOLUNTARY LEVEL 2 ASSESSMENTS

- Year-round, Non-Community Systems, on Groundwater, under 1,000 in population
  - When required to sample monthly
  - Need a voluntary Level 2 Assessment or Sanitary Survey within last 12 months (among other criteria) to be graduated to quarterly monitoring.

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

SEASONAL SYSTEMS UNDER THE RTCR

Seasonal Systems:

- Do not serve water to a public population (25 or more people) year round.
- Starts-up and Shuts-down at the beginning and end of an operating season.
- Does not necessarily de-pressurize.

Requirements:

1. Monthly Routine Monitoring
2. State-Approved Seasonal Start-Up Procedure and Certification

SEASONAL SYSTEMS: MONTHLY ROUTINE MONITORING

VERMONT
DRINKING WATER AND GROUNDWATER PROTECTION

MONITORING SCHEDULE

VT0000000 SEASONAL SYSTEM

Schedule Year: 2016 System Status A System Type: NC Primary Source: GW Population: 34

COLIFORM BACTERIA MONITORING

Sampling Locations	Facility ID	Facility Name	Sample Point ID	Description
	DS001	DISTRIBUTION SYSTEM	TC001	

Analyte/Group Name	Monitoring Period	Monitoring Frequency
COLIFORM BACTERIA	5/1 - 10/31	1 every Month

- Required to collect 1 TC sample in each month the system is in operation.

SEASONAL STARTUP PROCEDURE

Seasonal systems are required to complete a State-Approved Seasonal Start-Up Procedure & Certification prior to serving water to the public.

Goal: Identify and eliminate pathways of contamination prior to serving water to the public.

1. Comprehensive visual inspection of the water system.
2. Shock-Chlorinate and/or Flush the Water System.
3. Collect Your Monthly Sample.
4. Sign the Certification of Completion.
5. Submit the Form to DWGWP.

SEASONAL STARTUP PROCEDURE

VERMONT
ENVIRONMENTAL CONSERVATION

Drinking Water and Groundwater Protection Division

Seasonal Start-Up Procedures and Certification

Public Water Systems Serving Groundwater

The use and submission of this form is recommended for all seasonal groundwater public water systems at the beginning of the 2015 operating season before serving water to the public. These procedures are **recommended** for the 2015 operating season, but will be **required** for the 2016 operating season according to the Revised Total Coliform Rule.

System Information

System Name:	WSID #:	Class of System: 1A 1B 2 3 4 4A1 4A 4B 4C D (circle one)

What months are you open? _____

What day was this start-up procedure completed? _____

What day do you plan on opening in 2015? _____

Instructions

The Division recommends that all seasonal systems complete this form at the beginning of the 2015 operating season before serving water to the public.

Complete Step 1 below. Certify that each element was evaluated by checking the "Complete" or "NA" box if the element is Not Applicable to the Water System. Shock-chlorinate and flush the water system and collect the routine monthly sample(s) as outlined in Steps 2 and 3 and certify they are complete by checking the "Complete" box. Sign and date the form according to Step 4 and return the form to the Division according to Step 5. Return the signed and dated form to the Division prior to opening, along with any feedback you have on the use of the form itself.

Step 1: Visual Inspection of the Water System **Visually inspect the source, treatment, storage, and distribution system for sanitary deficiencies.**		Complete	NA
a)	If the system has a well: Check the well. Make sure that the well cap is tight and intact and that no bolts are missing. Make sure that the electrical conduit is not cracked or broken. Confirm that the vent screen is in place and intact. Make sure the area around the well is graded to prevent water from ponding around the casing.	☐	☐
b)	If the system has a spring: Check the spring. Make sure the cover is adequately sealed and no insects, rodents, or debris are able to get into the spring. Make sure any vents or overflows have adequate screening on the ends of the pipes. Make sure the spring box integrity prevents surface water infiltration. Make sure there are no new potential sources of contamination near the spring.	☐	☐
c)	If the system utilizes treatment: Make sure the treatment equipment is operational and maintained. Make sure chemical storage tanks are cleaned and sealed and all solutions are refreshed. Make sure the system has adequate test equipment, such as a chlorine test kit with valid reagent packets. Make sure any backwash or discharge lines have an air gap and are not hard-piped into drains.	☐	☐
d)	If the system utilizes water storage: Make sure the storage tank has been inspected and cleaned (if necessary) within the last 5 years. Make sure the access hatch/cover is gasketed, watertight, and made of the appropriate materials (no wooden covers). Make sure the storage tank is free from insects, rodents, and debris. Make sure any overflows, drains, or vents have screens covering the pipes. Make sure the overflow and drain pipes terminate above ground and prevent contamination from surface water.	☐	☐
e)	Distribution: Make sure the system maintains adequate pressure. Make sure there are no cross-connection hazards. Make sure pumps and valves are operating properly. Make sure valve pits are free of standing water and debris. Confirm that there are no obvious signs of leaks or line breaks.	☐	☐
f)	Routine Sample Locations: Make sure routine sampling locations are identified, that faucets are appropriate for total coliform testing (no swivel faucets, separate hot and cold faucets if possible), and that sample taps and sinks are clean.	☐	☐

SEASONAL STARTUP PROCEDURE

Step 2: Shock-Chlorinate and/or Flush the Water System **After visually inspecting the water system and making any necessary improvements, shock-chlorinate and/or flush portions of the water system that may include, but not be limited to, the source, storage facilities, treatment, and the distribution system. Write a brief summary of the shock-chlorination procedure implemented in the space provided.**	Complete
	☐
a) Chlorine residual introduced to distribution system (if measured): _____	
b) Duration of time chlorine maintained in the distribution system (if applicable): _____	
Step 3: Collect a Routine Monthly Sample **After shock-chlorinating and/or flushing the system, collect a total coliform bacteria sample any time during the first month of operation and send it to a certified laboratory for analysis.**	Complete
a) Collect one sample at any time during the first month of operation. The sample may be collected before or after water is made available to the public.	☐
b) Code the sample as Routine (RT) on the laboratory chain of custody.	

Step 4: Certification of Completion **Upon completion of all necessary steps above, fill out the certification below.**	
Print Name	Title
Signature	Date
I certify that I am the person authorized to fill out this form and that the information contained herin is true, accurate, and complete to the best of my knowledge and ability at the time the procedure was performed.	

Step 5: Return Form to the DWGPD **Submit a copy of the completed form to the Drinking Water and Groundwater Protection Division no later than 10 days following the month of service start-up (e.g. The report is due by June 10th for systems returned to service in May). Keep a copy of this form for your records.**
TNC Program Specialist Drinking Water and Groundwater Protection Division One National Life Drive - Main 2 Montpelier, VT 05620-3521 Fax: 802-828-1541

SEASONAL STARTUP PROCEDURE WALKTHROUGH

Step 1: Visual Inspection of the Water System

a) Visually inspect the Source: Well

- Is the cap bolted and tight?
- Is the electrical conduit secured to the cap?
- Is the cap / conduit broken or cracked?
- Is there a screen on the vent?
- Is there adequate drainage?

Step 1: Visual Inspection of the Water System

b) Visually inspect the Source: Spring

- Is the cover sealed and tight?
- Does the source need to be cleaned of debris and sediment?
- Are there indications of insect / rodent activity?
- Are the vents / overflows screened?
- Do the vents / overflow terminate 18” above grade?

SEASONAL STARTUP PROCEDURE WALKTHROUGH

Step 1: Visual Inspection of the Water System

c) Visually inspect the Treatment Plant

- Maintained and operational?
- Is your chemical solution fresh?
- Are chemical storage cleaned and sealed?
- Did your chemical reagents expire? Is your equipment calibrated?
- Backwash / discharge line have air gaps?

SEASONAL STARTUP PROCEDURE WALKTHROUGH

Step 1: Visual Inspection of the Water System

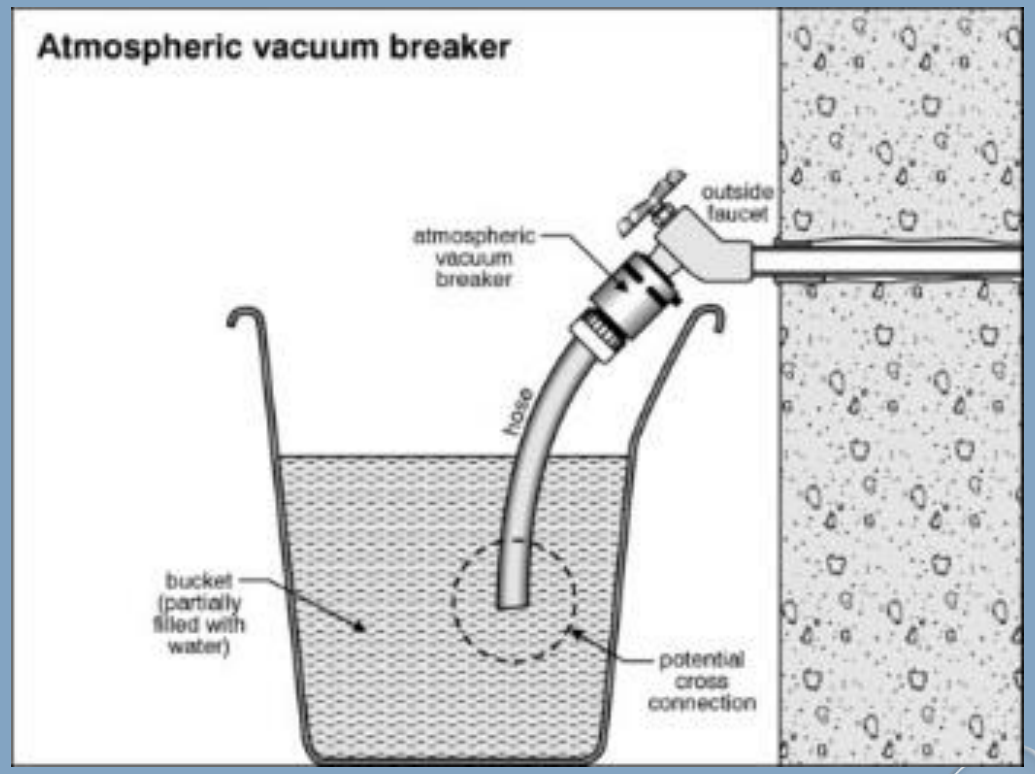
d) Visually inspect the Storage Tank

- Has the tank been inspected / cleaned?
- Is the integrity of your storage tank maintained?
- Watertight cover?
- Sealed penetrations?
- Is the vent / overflow / drain screened?
- Does the vent / overflow / drain terminate 18” above grade?

Step 1: Visual Inspection of the Water System

e) Visually inspect the Distribution System

- Does the system maintain adequate pressure?
- Are there any cross-connection hazards?
- Are hoses fitted with vacuum breakers / backflow prevention devices?
- Are pumps and valves operating properly?
- Are valve pits free of standing water?
- Are there signs of leaks / line breaks?

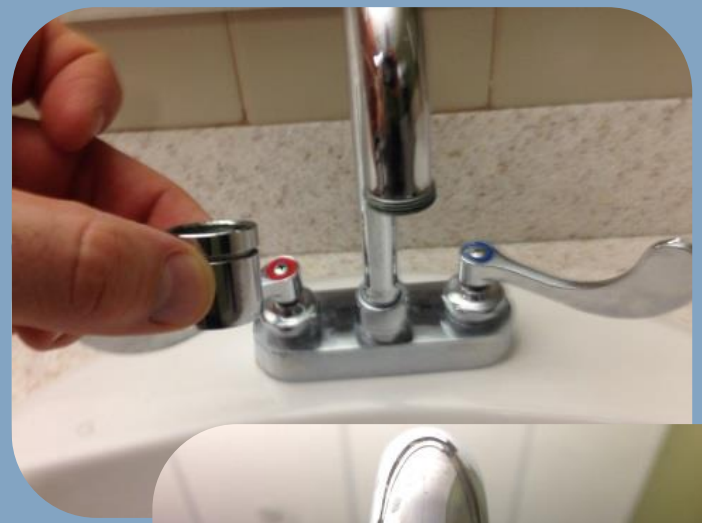


http://www.homesmsprealestateblog.com/images/2008/07/13/1547_2.jpg

Step 1: Visual Inspection of the Water System

e) Visually inspect Sample Locations

- Identify routine sample locations.
- Avoid swivel / mixing faucets.
- Avoid automatic faucets.
- Avoid internal threads.
- Remove aerators.
- Make sure sample tap is clean and accessible.



SEASONAL STARTUP PROCEDURE WALKTHROUGH

Step 2: Shock-Chlorinate and/or Flush the Water System

Step 2: Shock-Chlorinate and/or Flush the Water System After visually inspecting the water system and making any necessary improvements, shock-chlorinate and/or flush portions of the water system that may include, but not be limited to, the source, storage facilities, treatment, and the distribution system. Write a brief summary of the shock-chlorination procedure implemented in the space provided.	Complete
	☐
a) Chlorine residual introduced to distribution system (if measured): _____	
b) Duration of time chlorine maintained in the distribution system (if applicable): _____	

Picture Reference: http://www.health.state.mn.us/divs/eh/wells/waterquality/disinfection.pdf

Guidance Documents:

- VT Rural Water
- VT DOH

SEASONAL STARTUP PROCEDURE WALKTHROUGH

Steps 3 – 5: Sample, Sign, Submit

Step 3: Take your Sample!

- Collect your monthly routine monitoring bacteria sample.

Step 4: Sign the Certification of Completion

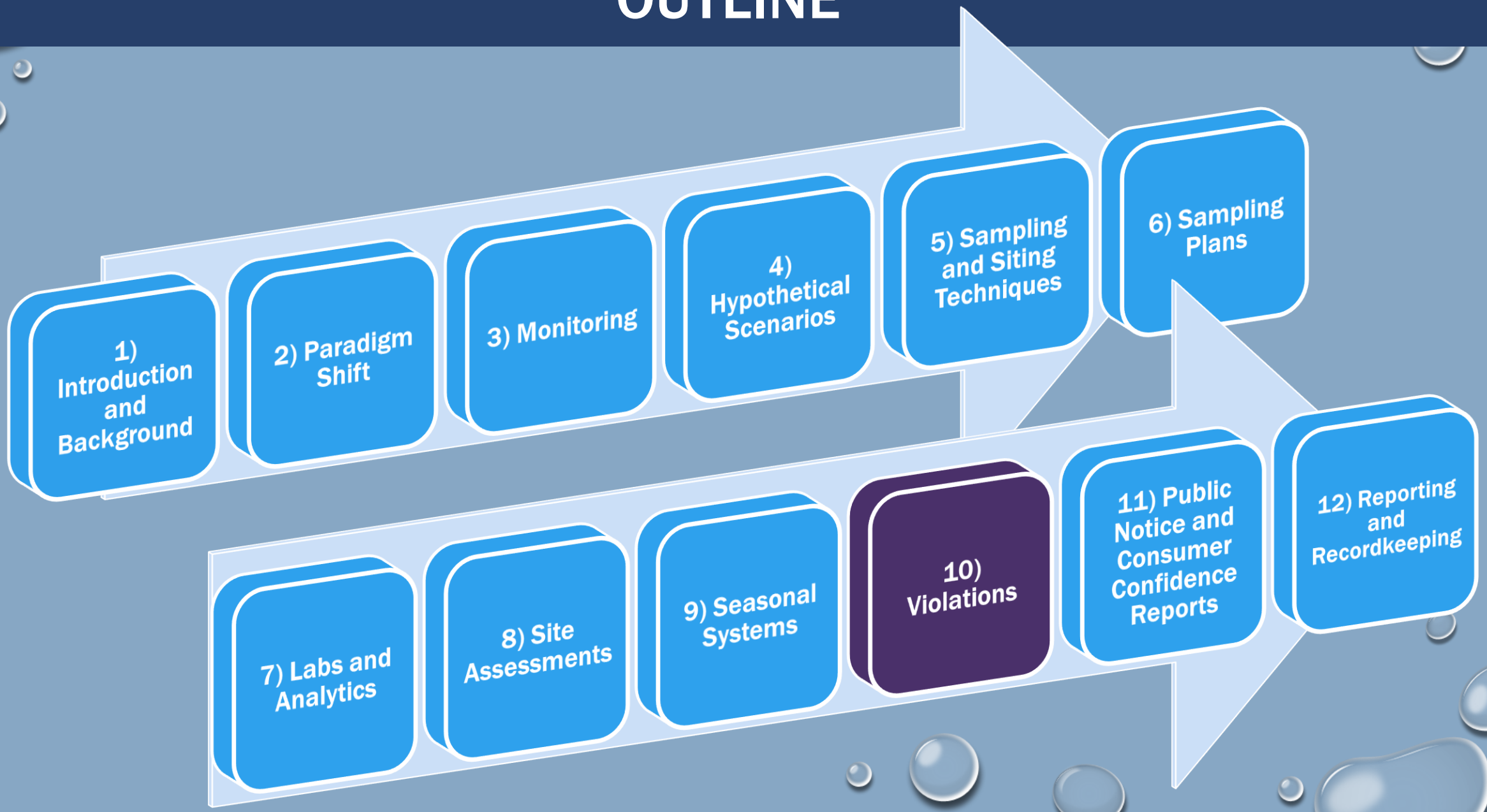
- Upon completion of Steps 1 – 3 sign the certification form.

Step 5: Submit to DWGWP

- Submit signed form to the DWGWP no later than 10 days following the month of startup.

Step 4: Certification of Completion Upon completion of all necessary steps above, fill out the certification below.	
Print Name	Title
Signature	Date
I certify under penalty of law that I am the person authorized to fill out this form, and the information contained herein is true, accurate and complete to the best of my knowledge and belief.	
Step 5: Return Form to the DWGPD Submit a copy of the completed form to the Drinking Water and Groundwater Protection Division no later than 10 days following the month of service start-up (e.g. The report is due by June 10th for systems returned to service in May). Keep a copy of this form for your records.	
TNC Program Specialist Drinking Water and Groundwater Protection Division One National Life Drive - Main 2 Montpelier, VT 05620-3521 Fax: 802-828-1541	

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

4 RTCR VIOLATIONS

RTCR Violation Types

1. E. Coli MCL Violation (Tier 1)
2. Treatment Technique Violation (Tier 2)
3. Monitoring Violation (Tier 3)
4. Reporting Violation (Tier 3)

E. COLI MCL VIOLATION

- TC+ routine sample followed by a EC+ repeat sample
- EC+ routine sample followed by TC+ (or EC+) repeat sample
- Fails to test for E. coli when a repeat sample is TC+
- EC+ sample followed by a failure to collect all repeat samples

E. Coli MCL Violation

- TC+ RT → EC+ RP
- EC+ RT → TC+ RP (or EC)
- TC+ RT → TC+ RP and E. coli not analyzed
- EC+ RT → All Repeats not Taken

E. Coli violations are Tier 1 which require public notice within 24 hours.

TREATMENT TECHNIQUE VIOLATION

- Failure to conduct the required assessment within 30 days of the trigger
- Failure to correct all sanitary defect(s) found through an assessment within 30 days of the trigger or in accordance with a State-approved schedule.
- Seasonal system does not complete start-up procedure prior to serving water to the public.

Treatment Technique Violations are Tier 2 which require public notice within 30 days.

MONITORING VIOLATION

- Failure to collect every required routine or additional routine sample in a compliance period
- Failure to test for E. coli following a routine sample that is TC+

Monitoring violations are Tier 3 which require public notice within 1 year

REPORTING VIOLATION

- Failure to submit a monitoring report or completed assessment form after a system properly conducts monitoring or an assessment in a timely manner.
- Failure to notify the State of an EC + sample the day the system learns of the EC detection.
- Failure of a seasonal system to submit a certification of completion of the State-approved start-up procedure.

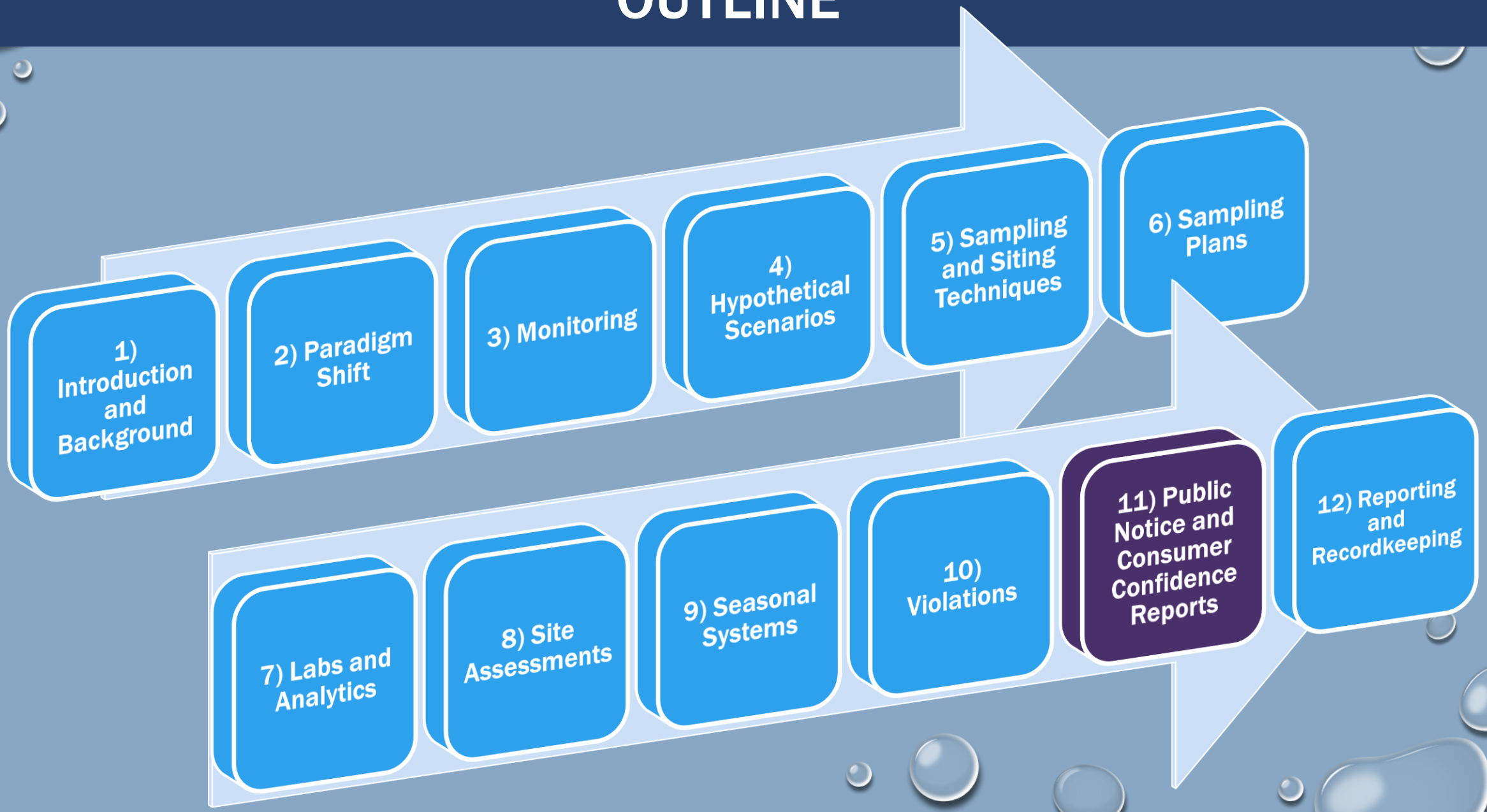
Reporting violations are Tier 3 which require public notice within 1 year

COMPLIANCE GUIDE

Sample Results		E. Coli MCL Violation?	Required Assessment
RT Sample	RP Sample		
EC +	TC +	YES	Level 2
EC +	Any Missed		
TC +	EC +		
TC +	TC+ (E.coli not analyzed)		
TC +	Any Missed	NO	Level 1*
TC +	TC+		
TC +	TC -	NO	NO
EC +	TC -		

* Level 2 Assessment is required for second Level 1 in a rolling 12-month period

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

PUBLIC NOTICE FOR RTCR VIOLATIONS

Tier	Deadline to provide notice	RTCR Violation	Repeat Notices
1	24 hours	E. Coli MCL Violation	Every 3 months until the situation is resolved
2	30 days	Treatment Technique Violation	Every 3 months until the situation is resolved
3	1 year	Monitoring Violation Reporting Violation	Annually until the situation is resolved

Description of violation

Actions consumers should take

Potential health effects

When the system expects to resolve the violation

Name and phone number for more information

When the violation occurred

Should alternate water supplies be used

Population at risk

What is being done to correct the violation

Required distribution language

DRINKING WATER WARNING
ABC Water System (VT0012345)
water is contaminated with fecal coliform (or *E. coli*)

BOIL YOUR WATER BEFORE USING

Fecal coliform [or *E. coli*] bacteria were found in the water supply on 8/1/15. These bacteria can make you sick, and are a particular concern for people with weakened immune systems.

What should I do?

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation **until further notice**. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.

The symptoms above are not only caused by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care providers.

What happened? What is being done?
Bacterial contamination can occur when increased run-off enters the drinking water source (for example, following heavy rains). It can also happen due to a break in the distribution system (pipes) or a failure in the water treatment process.

Two samples tested positive for E.coli in the Main Well distribution following a heavy rain event. Inspection of the well found some pitting in the casing and further investigation identified corrosion holes in the casing below the ground surface to a depth of 2 feet. We have contracted with a well drilling company to remove and replace the damage portion of the well casing. We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within 1 week.

For more information, please contact First Last at 802-123-4567 or
1 National Life Dr
Montpelier, VT 05620

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Certification
Method(s) of Distribution: Hand delivered to each unit and posted in community building. Date Distributed: 8/2/15
(e.g. hand or direct delivery, posting[1], television, radio)

I First Last (print name) Certify, as the Responsible Person (or authorized representative) of the water system indicated above, that the public notice has been provided to customers in accordance with the delivery, content, and format requirements and deadlines in the Vermont Water Supply Rule (Chapter 21, Subchapter 21-10).

Signature: _____ Date: 8/2/15
Within 10 days of issuance of public notice, send a copy of the notice to:
Drinking Water and Groundwater Protection Division, One National Life Drive – Main 2, Montpelier, VT 05620-3521

1 - Community Water Systems may use posting as a second method, but must also use radio, television, or hand or direct delivery.

ISSUING A PUBLIC NOTICE

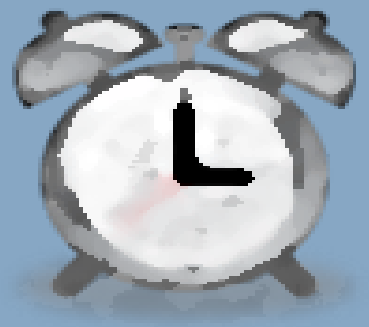
Water Systems must provide the public notice in a form and manner that is reasonably calculated to reach persons served in the required time period.

The form and manner may vary based on the specific situation and type of water system, but it must meet the following requirements:

ISSUING TIER 1 PUBLIC NOTICE WITHIN 24 HOURS

Must use one or more of the following:

1. Hand delivery to persons served
2. Posting in conspicuous locations*
3. Broadcast media such as radio or TV
4. Another delivery method approved by the Division



* CWS may use posting as a second method, but must also use radio, TV, or hand or direct delivery.

ISSUING TIER 2 OR 3 PUBLIC NOTICE

Tier 2 within 30 days	Tier 3 within 1 Year

CWS	1. Mail or other DIRECT DELIVERY to each customer receiving a bill and to other service connections to which water is delivered; and 2. Any other method reasonably calculated to reach other persons regularly served by the water system if they would not normally be reached by the first method. (e.g. renters, students, employees)
NTNC and TNC	1. Posting in conspicuous locations throughout the distribution system OR mail or direct delivery to each customer and service connection; and 2. Any other method reasonably calculated to reach other persons regularly served by the water system if they would not normally be reached by the first method

CONSUMER CONFIDENCE REPORT (CCR) CWS ONLY

Complete/distribute by July 1 of each year to cover the previous year

CCRs summarize information regarding:

- the sources used
- detected contaminants
- compliance issues
- health and educational information

CCRs are also a good opportunity to provide any updates:

- system improvements over the last year
- anticipated improvements (short and long term)
- staff recognition (new staff, education, awards)

REPORTING ASSESSMENTS IN THE CCR

Changes include the requirement to report Level 1 and Level 2 Assessments, if triggered.

- The number of assessments required and completed
- The corrective actions required and completed
- The reasons for conducting assessments and corrective actions
- Whether the CWS has failed to complete any required assessments or corrective actions

REPORTING REQUIREMENTS IN THE CCR

- Health effects for CCR requires specific language for:
  - Level 1 or 2 Assessment **NOT RESULTING** from an E. coli MCL Violation
  - Level 1 or 2 Assessment **RESULTING** from an E. coli MCL Violation
- Reporting TT violations in the CCR
  - For a Treatment Technique violation for failure to complete all required assessments or correct all identified sanitary defects, include one or both of the following statements, as appropriate
    1. During the past year we failed to conduct all of the required assessment(s)
    2. During the past year we failed to correct all identified defects that were found during the assessment

READ AND COMPLETE THE CCR TEMPLATES

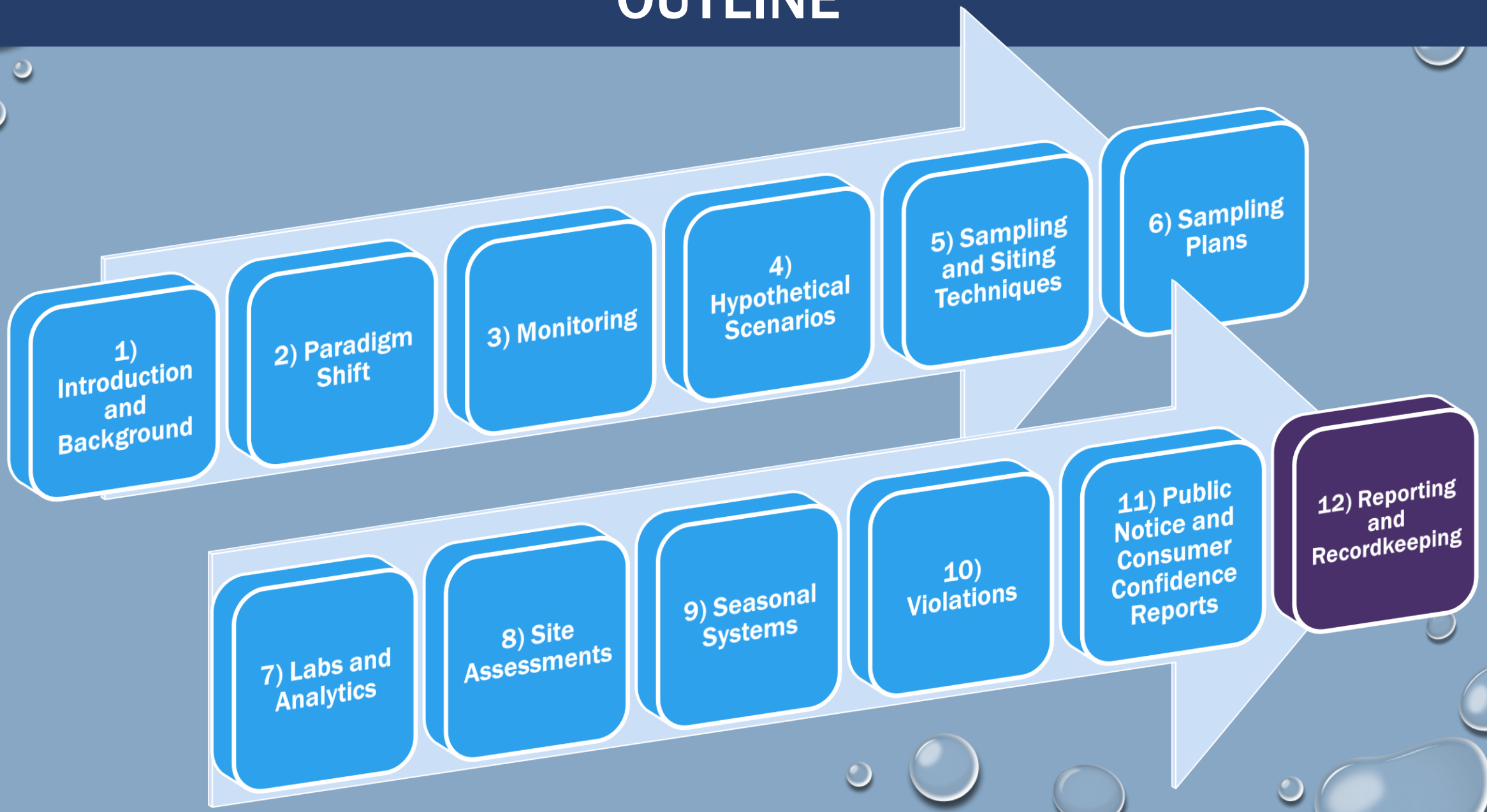
- Date and time of water system meetings
- Name and contact information for the person who can answer questions about the CCR
- Tables are complete and accurate
- Explanation of violations including steps taken to address them
- Progress made or a schedule to address significant deficiencies and the Permit to Operate compliance schedule activities.
- All sections must be complete prior to distributing

DISTRIBUTING YOUR CCR

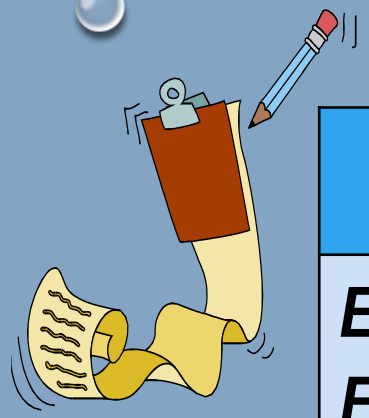
There must be at least one form of DIRECT DELIVERY of the CCR which may include:

- Mailing a copy to each bill-paying customer
- Hand delivering a copy to each service connection
- Electronic delivery* (must meet certain requirements)
  - Paper or electronic communication (e.g. email, water bill, post card notification) must provide the specific URL providing a direct link to the CCR
  - If a customer is unable to receive a CCR by the chosen electronic method, the CCR must be provided by an alternative method allowed by the Rule
  - If using an electronic delivery, a prominently displayed message and the direct URL must be include in ALL notifications of CCR availability

OUTLINE


1) Introduction and Background
2) Paradigm Shift
3) Monitoring
4) Hypothetical Scenarios
5) Sampling and Siting Techniques
6) Sampling Plans
7) Labs and Analytics
8) Site Assessments
9) Seasonal Systems
10) Violations
11) Public Notice and Consumer Confidence Reports
12) Reporting and Recordkeeping

REPORTING REQUIREMENTS



Systems Must Report To The State:

REQUIREMENT	TIMING
E. coli MCL violation, or *E. coli* positive routine sample	By end of current business day (or next business day if state office is closed)
TT violation	By end of next business day
Level 1 or 2 assessment report	Within 30 days of learning that the system has exceeded a TT trigger

REPORTING REQUIREMENTS, (CONT.)

Systems Must Report To The State:

REQUIREMENT	TIMING
Coliform monitoring violation	Within 10 days of learning of violation
Completion of corrective action, if occurring after submittal of an assessment report	When each corrective action is completed
Seasonal system certification of compliance with state-approved start-up procedures	No later than 10 days following the close of the month in which the system opened.

PWS RECORDKEEPING

Systems Must Maintain Records:

REQUIREMENT	TIMING
Records of action taken by the system to correct violations	3 years
Public notices issued & certifications made	3 years
Records of microbiological analysis	5 years
Copies of monitoring plans	As long as analyses are required

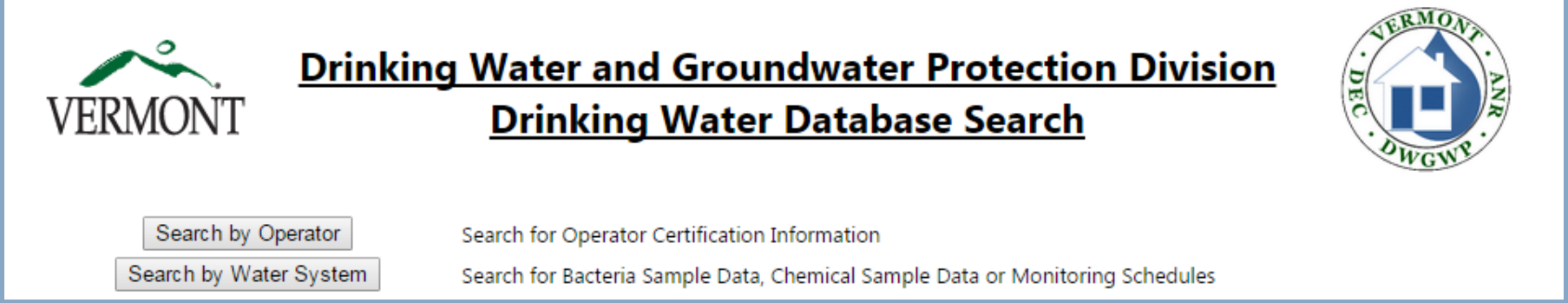
PWS RECORDKEEPING (CONT.)

Systems Must Maintain Records:

REQUIREMENT	TIMING
Level 1 or 2 assessment forms	5 years
Documentation of corrective actions	
Other available summary documentation of sanitary defects & corrective actions	
Records of any repeat samples taken that meet the state's criteria for an extension of the 24-hour period for collecting repeat samples	

WEBSITE AND ADDITIONAL INFORMATION

Search for operator certification Information



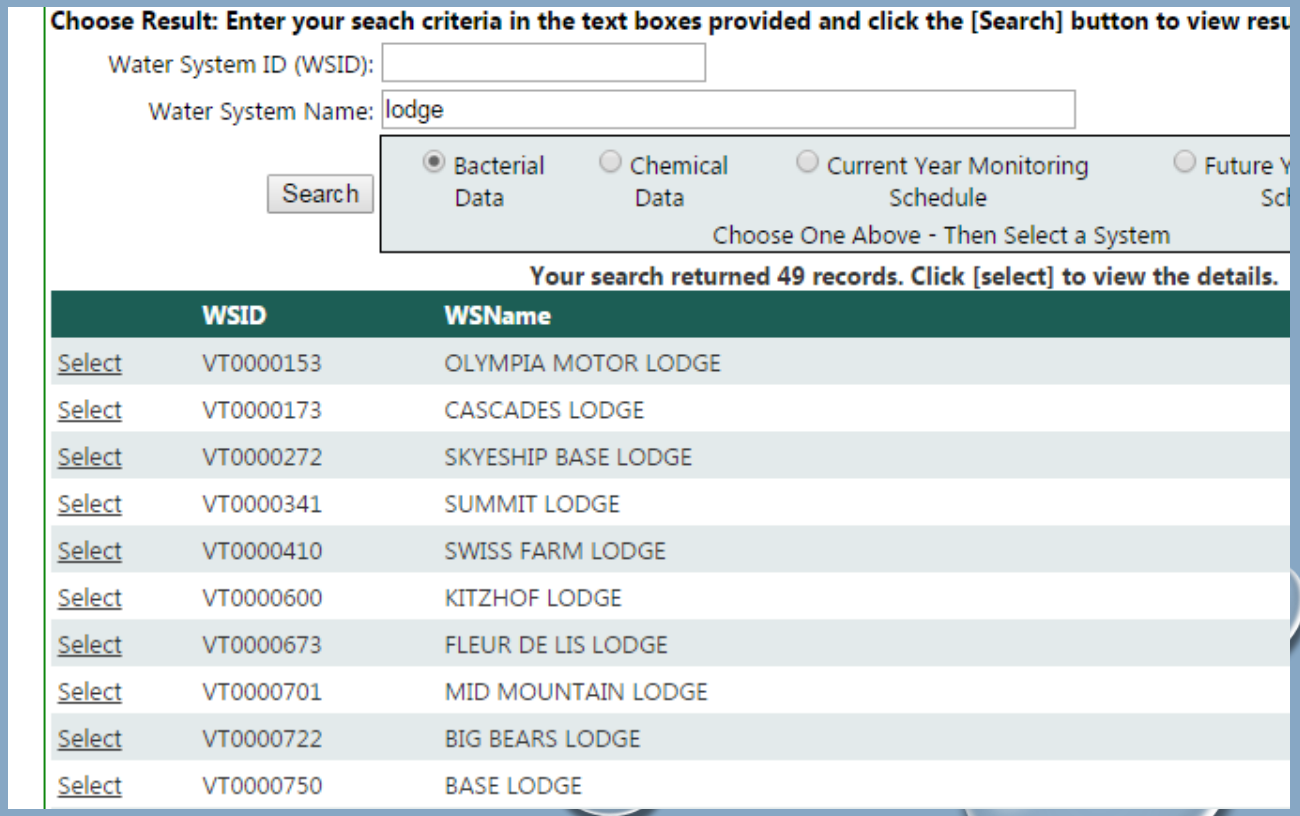
OR

Search for Water System information

- Bacterial data
- Chemical data
- Current and following year Monitoring Schedules

- Always to date with latest info available to the state

HTTPS://ANRWEB.VT.GOV/DEC/DWGWP



KEY TAKEAWAYS OF THE RTCR

- The RTCR goes into effect April 1, 2016
- There is no more Total Coliform MCL, E. coli MCL remains
- No more Total Coliform-based Public Notice or Boil Water requirements in Vermont, E. coli-based boil and PN remains
- Systems must take 3 repeat samples for **each** positive routine sample
  - Monthly systems resume normal monthly monitoring the month following a routine positive sample
  - Quarterly systems must perform 3 additional routine samples the month following a routine positive sample
  - Systems must complete each "set" of samples, regardless of sample results or triggers
- 2 or more total coliform samples in a month triggers a site assessment
- E. coli MCL violation requires a boil water notice and a Level 2 Site Assessment.
- State precautionary boil may apply.

REQUIRED ACTIONS

Before April 1st

- Submit new bacteriological sampling plan (templates/forms forthcoming)
- Attend RTCR training – Level 1 Assessments and Sampling Plans
- Check out DWGWP website

After April 1st

- Seasonal systems perform seasonal startup procedures and submit completed startup form to DWGWP

Sample early in monitoring period!

QUESTIONS AND CONTACTS

Ben Montross
ben.montross@Vermont.gov
802-498-8981

Meredith Simard
meredith.simard@Vermont.gov
802-585-4896

Jeff Girard
jeff.girard@Vermont.gov
802-585-0314

Nick Giannetti
nick.giannetti@Vermont.gov
802-447-2237

For questions regarding TNC systems

Julie Hackbarth
julie.hackbarth@Vermont.gov
802-585-4897

David Love
david.love@Vermont.gov
802-585-4902

For questions regarding Community or NTNC systems

VERMONT DEC ANR DWGWP

VERMONT ENVIRONMENTAL CONSERVATION