

Total Coliform Rule

Microbial Contamination Protection

Margie Evans

Bureau of Safe Drinking Water

Revised



Effective April 1, 2016

- Change
 - Coliform Detection Response
 - Repeat Monitoring Requirements
 - Month-after requirements
 - Quarterly Systems
- New
 - Sample Plan Review
 - Treatment Techniques and Triggers
 - Seasonal Start-Up Certification



Violations – 5 Types

- MCL Exceedance – Tier 1
 - *E. coli*
 - **No MCL for Total Coliform**
- Treatment Technique – Tier 2
 - seasonal start-up checklist
 - Assessment and corrections
- Failure to Monitor –Tier 3
 - Not taking Routine Samples
 - Not taking Repeat Samples
 - ~~Not analyzing for *E. coli*~~



But Wait – There's More Tier 3

- Failure to Report
 - ~~E. coli~~
 - ~~TC+~~
 - ~~Treatment Technique Trigger~~
- Failure to Plan
 - No TCR Plan
 - No Seasonal Start-up SOP
 - ~~Sample Plan Review~~
 - Maintain required records

Public Notice Requirements - Review

- Tier 1 Public Notice
 - Required within 24 hours
 - 2 methods of delivery
 - MCL Exceedance -- *E. coli*
- Tier 2 Public Notice
 - Required within 30 days
 - 2 methods of delivery
 - Not certifying seasonal start-up checklist
 - No completing Assessment and Corrections timely



Public Notice Requirements Review

- Tier 3 Public Notice
 - Completed within 1 year
 - 2 methods of delivery
 - Monitoring violations
 - Reporting and Recordkeeping violations



Quarterly Monitoring

- Non-Community
- Groundwater Only
- Serving 1,000 or less



RTCR Monitoring

- Systems Sample Quarterly
- If
 - Two Level 1 or 1 Level 2 assessment within 12 months
 - Exceed E. coli MCL
 - Coliform treatment technique violation



Return to Quarterly Monitoring

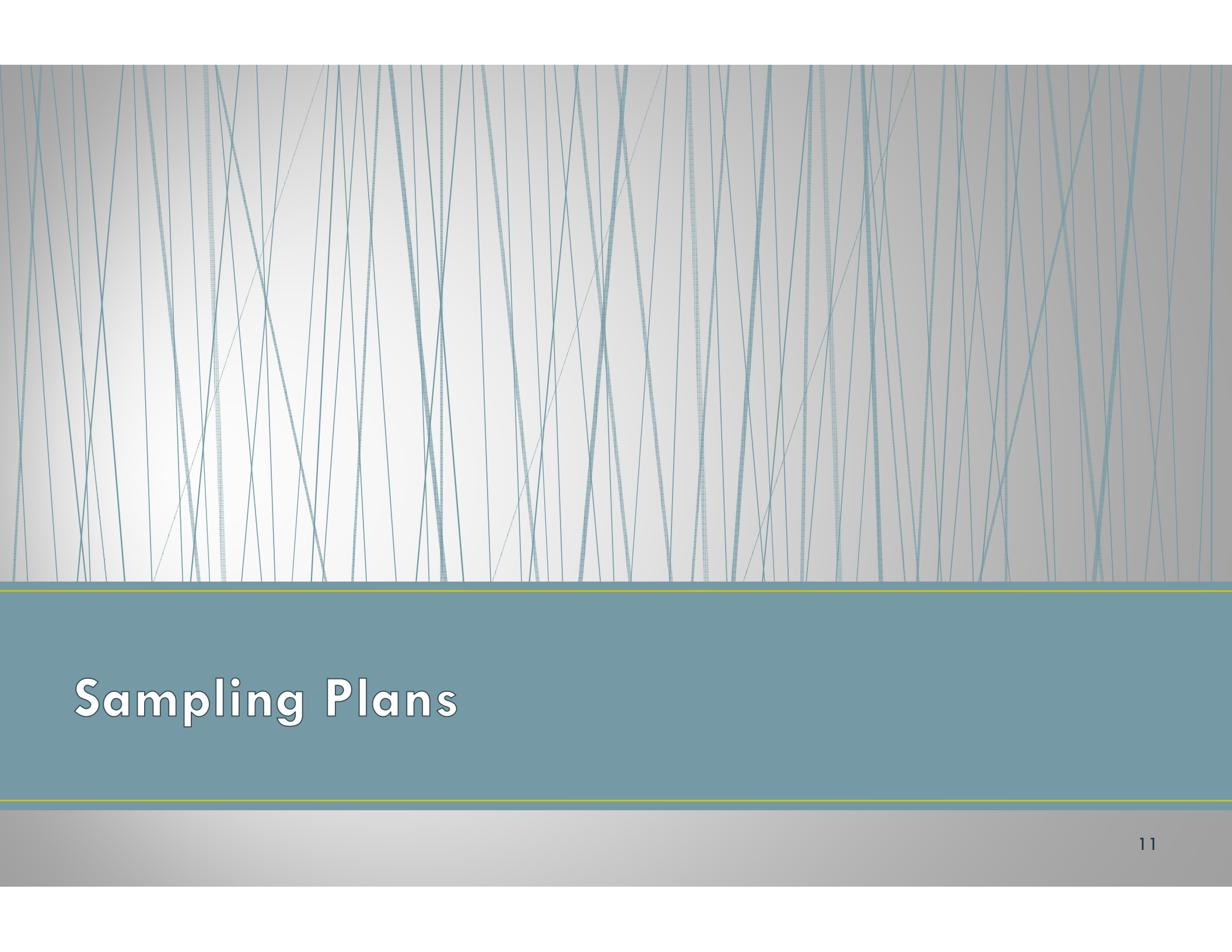
- 12 months of clean compliance history
- Within 12 months had:
 - 1. Sanitary Survey
or
 - 2. Site Visit
or
 - 3. Voluntary Level 2 Assessment
- Free of sanitary defects



Bottom Line

On Monthly Monitoring for at least a year





Sampling Plans

Compliance Monitoring

- With Approved Plan
 - You submit samples
 - Use sites specified and label accordingly
 - We accept samples
 - Verify sampling locations
 - Compliance Confirmed
- Without Approved Plan
 - You submit samples
 - Taken at correct times
 - Sites, samples labeled
 - We receive samples
 - No approved plan on file
 - Samples cannot be accepted
 - Violation Confirmed



Monthly Plan Template

- Routine Sites
- Repeat Sites

- Origin
- Upstream
- Downstream

OR

- Origin
- Two other locations that represent distribution system

II. Monitoring Locations Attach additional copies of this sheet if more room is needed.			
Routine Sites		Repeat Sites	
Routine 1		Repeat 1A	
		Repeat 1B	
		Repeat 1C	
Routine 2		Repeat 2A	
		Repeat 2B	
		Repeat 2C	
Routine 3		Repeat 3A	
		Repeat 3B	
		Repeat 3C	

Additional Sampling Requirements

- Systems sampling quarterly
 - Sample same 3 repeat sites the month following a positive
- Systems sampling monthly
 - No additional sampling requirement for month following
- No 5-sample set required the following month

Current Plan Approved

II. Monitoring Locations Attach additional copies of this sheet if more room is needed.			
Routine Sites		Repeat Sites	
Routine 1		Repeat 1A	
		Repeat 1B	
		Repeat 1C	
		Repeat 1D	
Routine 2		Repeat 2A	
		Repeat 2B	
		Repeat 2C	
Routine 3		Repeat 3A	
		Repeat 3B	
		Repeat 3C	
Routine 4		Repeat 4A	
		Repeat 4B	
		Repeat 4C	

III. Ground Water Samples Required (In the event of a coliform detect)	
Sources Required	
Source 1	
Source 2	
Source 3	

In the month following a coliform positive sample, System is required to take 5 samples from distribution, including the location of the initial positive sample. Those sample locations are outlined below.

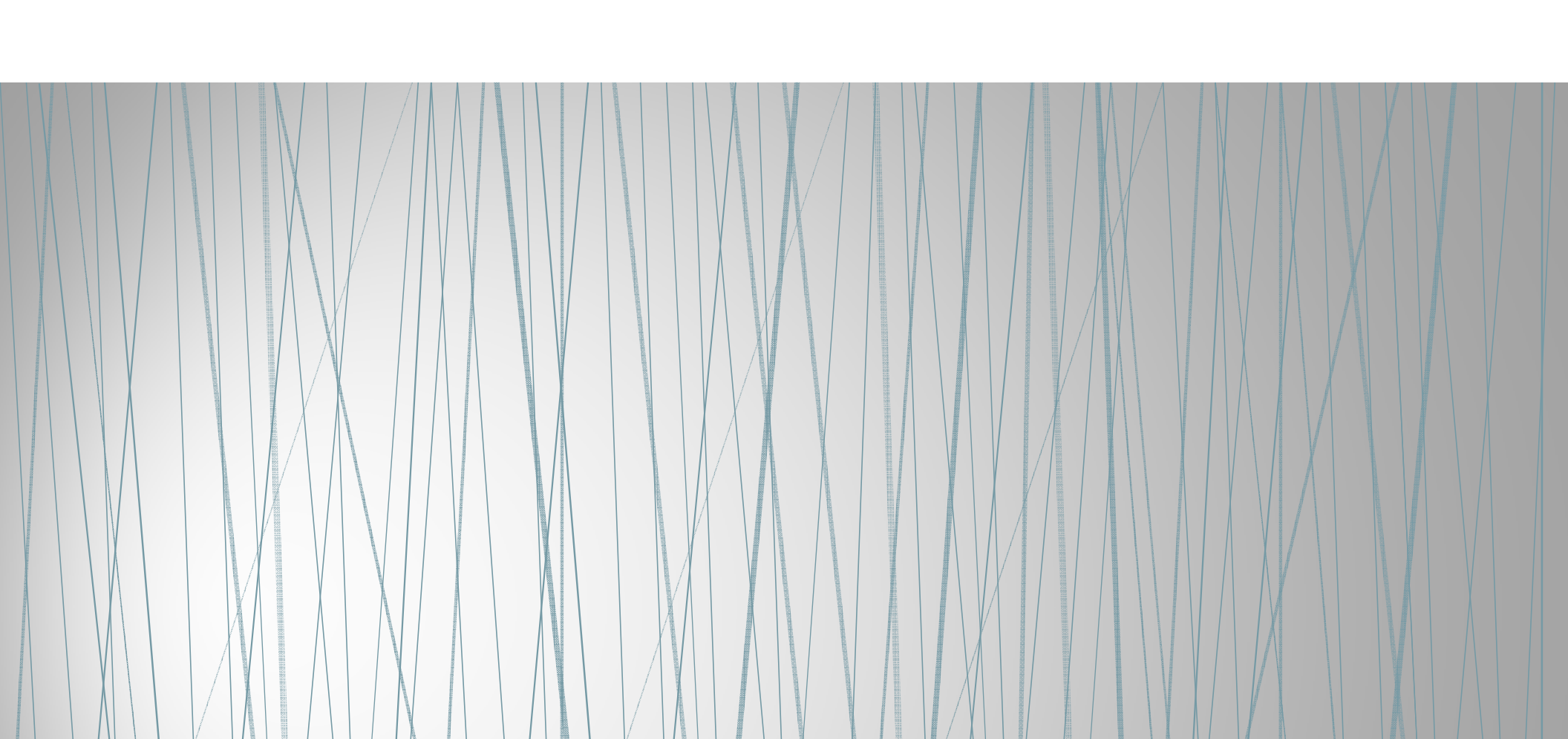
IV. Following Month Monitoring Populate if less than 5 Routine Samples per month/quarter.	
Temporary Routine Site	
Temp 1	
Temp 2	
Temp 3	
Temp 4	
Temp 5	

Section Break (Next Page)

Sanitary Survey Plan Review

- Resources
- System Classification
 - Changes in population or type
 - TNC
 - Community
 - NTNC
- Number of Samples
 - Frequency for non-community systems
 - Based on monthly population
 - Quantity
 - Based on average daily population

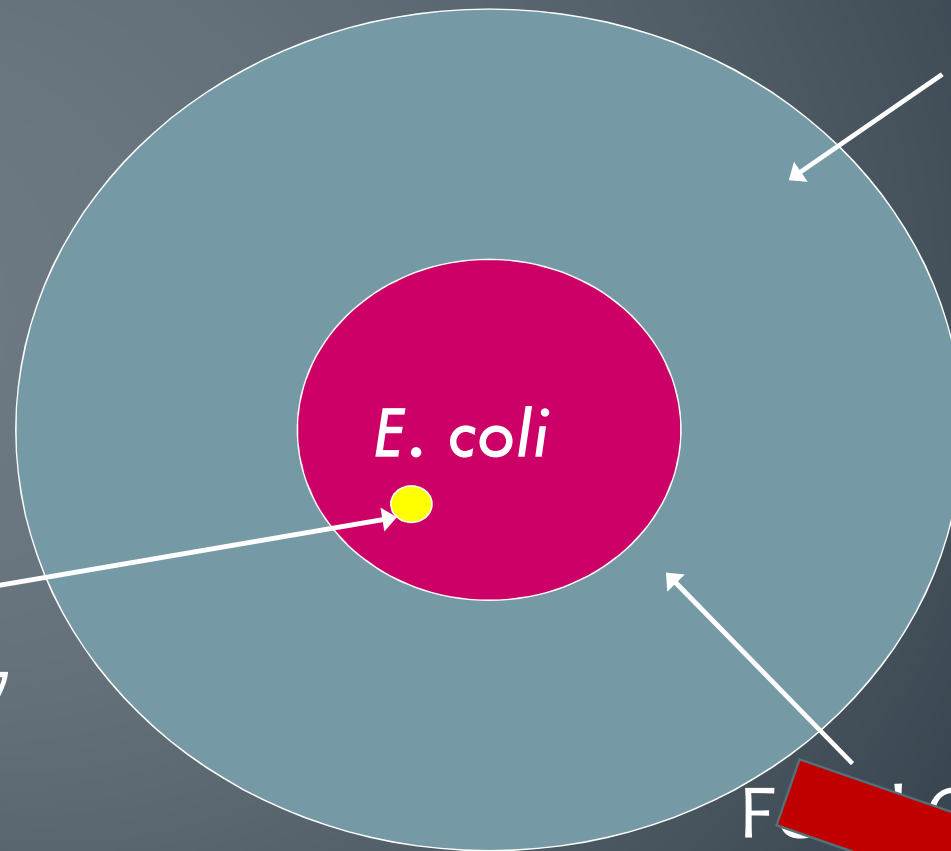




Treatment Techniques

Under RTCR

Relativity



Total Coliform (TC)
Total Coliform = non-acute contaminant

***E. Coli* (EC) O157:H7**
(acute contaminant)



Fecal Coliform
Fecal Coliform = Fecal Contamination (acute contaminant)

Terminology for Small Systems

- A Confirmed Coliform
 - TC+ and at least 1 TC+ repeat
- Triggers a Level 1 Assessment (Treatment Technique)
- An *E. coli* confirmed
 - TC+ and an EC+ repeat
 - EC+ and at least TC+ repeat
 - EC+ and failure to take repeats
- Triggers a Level 2 Assessment (Treatment Technique)
- Triggers a Tier 1 Public Notice (Boil Water Order)



Triggered

- Facility Manager and Rule Manager
 - Concerns and Considerations
 - Conference Call Consult
- Pre-Assessment Requirements
 - Disinfection?
 - Investigative samples?
 - Flushing?
 - Other Procedures???

Assessments

- Level 1 Assessment
 - Done by system
 - Following confirmed coliform
 - Phone assistance available
 - NvRWA assistance possible





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BUREAU OF SAFE DRINKING WATER

Level 1 Assessment

PWS ID#:	PWS Name:	City/Town:
Compliance Period (mm/yy)		
INSTRUCTIONS:		
Section A: Review and evaluate the listed elements typically found in a PWS. Check (✓) yes or no on all elements reviewed. Check (✓) "NA" if the section is not applicable to the PWS. Section B: Description of Occurrence: Provide an explanation on any issues identified. Elaborate as needed. Section C: Corrective Action: Provide corrective action(s) and completion dates for all sanitary defects identified. Submit this form within 30 days of triggering a Level 1 Assessment Treatment Technique.		
Section A		
1. GENERAL [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
Have any of the following occurred at sample sites prior to collecting bacteria samples?		
YES/NO	YES/NO	
☐ low/inadequate disinfectant residual	☐ loss of pressure (<20 psi)	
☐ operation/maintenance activities	☐ visible indicators of unsanitary conditions	
☐ firefighting event/flushing/sheared hydrant	☐ water quality parameters out of range	
☐ signs of vandalism/forced entry	Other: _____	
2. OPERATIONAL CHANGES [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO	YES/NO	
☐ potential source of contamination	☐ new source added	Other: _____
3. SAMPLING SITES [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO	YES/NO	
☐ unclean or unsuitable sample tap	☐ change in conditions at sample site	
☐ hot water intrusion	☐ note other sample tap uses:	
4. SAMPLING PROTOCOL [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO	YES/NO	
☐ improper sample container	☐ inadequate tap flushing	
☐ aerator was not removed	☐ improper hold time/storage temperature	
☐ auto sensing faucet/swivel-type faucet	☐ sampler error	Other: _____
5. TREATMENT PROCESS [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO	YES/NO	
☐ change in flow rates	☐ recent installation/repair	
☐ inadequate disinfection	☐ O & M procedures not followed	
☐ turbidity measurements out of range	☐ new source added	
☐ treatment added or changed	☐ interruption in treatment/power loss	Other: _____
6. DISTRIBUTION SYSTEM [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO	YES/NO	
☐ power loss	☐ operation of isolation valves resulting in breakage	
☐ standing water/debris in valve vault	☐ flushing of fire hydrants or blow-offs	
☐ low disinfection residuals	☐ improper operation of air-relief/air-vacuum valves	
☐ pump or valve failure	☐ installation of new mains or construction activity	
☐ pressure loss/inadequate pressure (<20 psi)	☐ improper operation of pumps/valves	
☐ improper surge control	☐ illegal use of hydrants	
☐ main breaks	☐ leaks	
☐ unprotected cross connection	☐ improper operation of valves	Other: _____
7. STORAGE TANKS [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO	YES/NO	
☐ improper maintenance practices	☐ low disinfectant residual	
☐ presence of dead animals/insects	☐ hatch not sealed	Other: _____
☐ incorrect operation of level control valves, altitude valves, and related appurtenances		
☐ deterioration, rust, holes, or other breaches in vent, overflow pipe, access hatch, screens, ladders, etc.		

** NA (not applicable) should be checked if PWS does not have that component (i.e. no springs)



8. SOURCES – Well [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO ☐ defective/damaged well cap/well seal ☐ floodwater/run-off inundation ☐ missing/damaged grout seal ☐ damaged pitless adapter	YES/NO ☐ damaged well casing ☐ damaged/unscreened vent ☐ unprotected opening in pump/pump assembly Other: _____	
Surface Water Supply [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO ☐ potential source of contamination ☐ change in sources ☐ flooding	YES/NO ☐ rapid snowmelt ☐ heavy rainfall Other: _____	
Spring [CHECK YES OR NO ON EACH ITEM] ☐ NA**		
YES/NO ☐ potential source of contamination ☐ infiltration of surface run-off	YES/NO ☐ improper development/poorly maintained spring box ☐ rapid snowmelt Other: _____	YES/NO ☐ heavy rainfall

** NA (not applicable) should be checked if PWS does not have that component (i.e. no springs)

Section B - Description of Occurrence Use this space to provide additional information that supports your findings (i.e. water quality and pressure monitoring data). Include corresponding dates with your findings.

☐ Check if PWS did not find any causes for the contamination.

Section C - Corrective Action Use this space to describe corrective action taken or proposed corrective action with corresponding dates.

PWS Representative (print name):	Signature of PWS Representative:
Sample Collector(s) (☐ same as above):	
Sample Collector(s):	Sample Collector(s):

Certification: I certify under penalty of law that I am authorized to fill out and complete this assessment and the information contained herein is true, accurate and complete to the best of my knowledge and belief.

Print Name: _____ Title: _____

Signature: _____ Date: _____

Phone #: _____ Email: _____

Return this form to the **Bureau of Safe Drinking Water Program** within 30 days of notification of a Level 1 Assessment Trigger.

AGENCY USE ONLY: Date received: _____		Agency Reviewer: _____
--	--	------------------------

Initial Trigger Date: _____	Initial Laboratory Notification Date: _____	Initial BSDW Consultation Date: _____
Total# routine and repeat samples: _____	Total# coliform positive samples: _____	Total# E-coli positive samples: _____
# of coliform detections in past 12 months: _____	# of Technique Triggers in past 12 months: L1 ____ / L2 ____	

Assessment Methodology

1. Sample Site

- a. Changes in use
- b. Clean
- c. New sampling personnel

2. Distribution and Storage

- a. System tight
- b. Tank turnover
- c. Biofilms

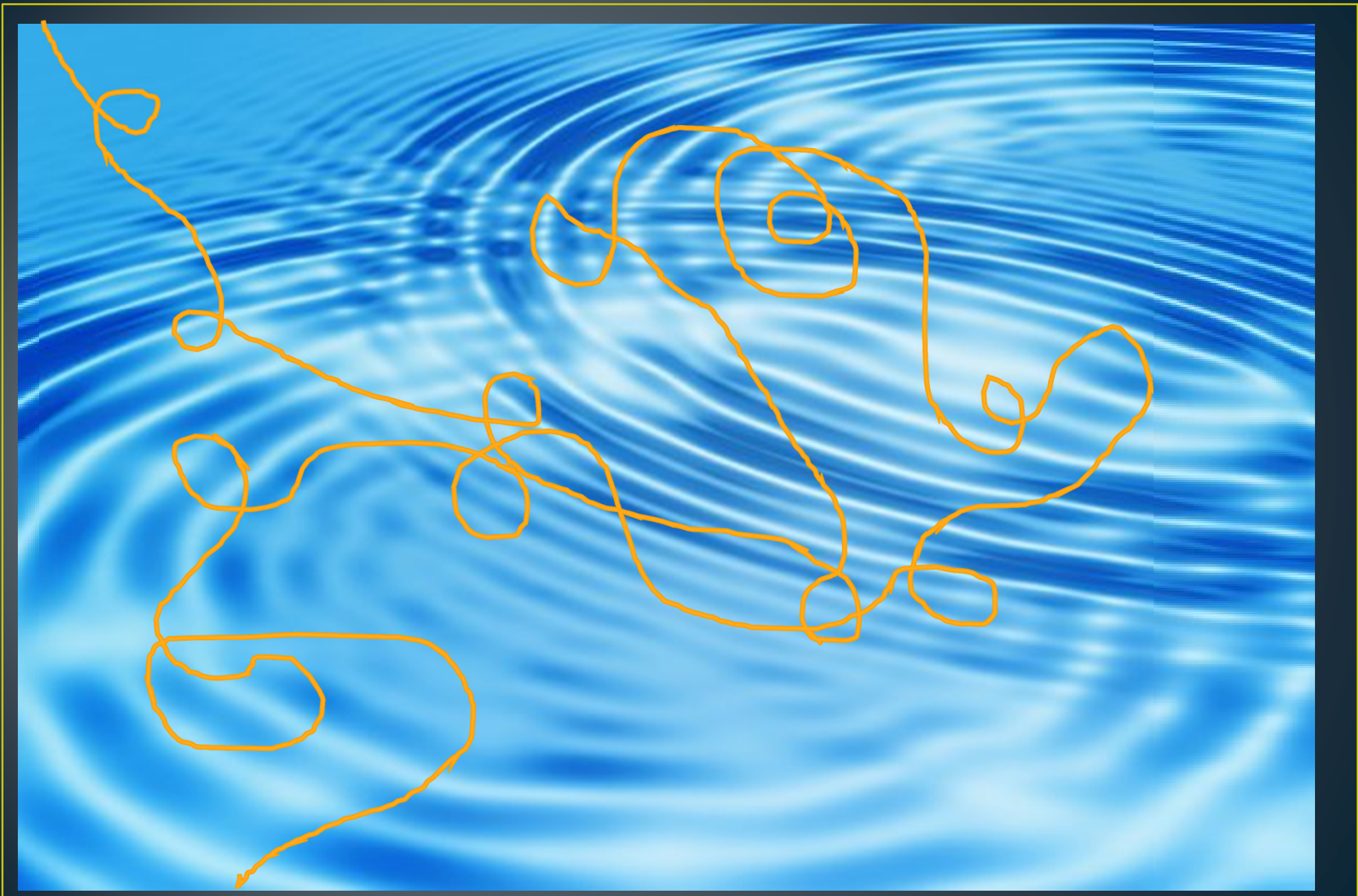
3. Treatment Process

- a. Flow rate changes
- b. Calibration needed
- c. New product used

4. Sources

5. Operations





Timeline

- Completed and returned to Agency within 30 days of trigger
 - Include Defects found, corrective actions planned/completed
 - If no defect found, ask questions
- Sanitary Defects corrected within 30 days of trigger
 - Corrective Action Plan in place if repairs can't be corrected in timeframe
- Failure to follow these steps and complete timely is a violation requiring public notice.

Level 2 Assessment

- Triggered by:
 - 2 or more coliform events within 12 month period
 - A confirmed E. coli (acute condition)
- Searching for Sanitary Defects
 - Atypical events
 - Recent repairs, losses of pressure
 - Sample Site issues
 - Treatment
 - Distribution
 - SOPs, O&M



Search for Sanitary Defects

- Much Greater Detail
 - Consideration
 - Investigation
 - Hydraulic flow
 - Changes to pressure regime across zones?
- Water quality parameters changing?
 - pH, Nitrate, turbidity?
- Question Everything
 - Disinfectant residual maintenance
 - Pressure Management
 - Main breaks/repairs
 - Water age and flushing
 - Storage facilities
 - Cross-connections
- Verification Samples



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Bureau of Safe Drinking Water

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**LEVEL 2 ASSESSMENT TREATMENT TECHNIQUE REPORT
CORRECTIVE ACTION REQUIRED**

System Name: _____

NV000 _____

Mailing Address

(Street) _____
(City) _____
(Zip) _____

System Type (Circle)

C - Community
NTNC - Non Transient
TNC - Transient

(If Seasonal) Operational Period _____

Population Served _____

Operator in Responsible
Charge (ORC) or Owner _____ Phone: _____

Date of Assessment Trigger: _____

Address _____

Date Assessment Completed: _____

Parties Present _____
/Affiliation: _____

Date _____

Item #	Defect and Corrective Action Required	Date Due	Date Corrected	Corrective Action Description (attach additional documentation as necessary)
Example 1a, 3i,	Pressure gauge on well discharge not functioning. Repair/replace pressure gauge in order to ensure consistent pressure across the system. Pressure must not be less than 20 psi or greater than 100 psi.	7/15/16	7/10/16	Pressure gauge replaced, and pressure readings are within the appropriate range. See attached photo and log of pressure readings

To return to compliance, the above named public water system is required to correct the sanitary defects outlined in this document.
Failure to comply will result in a violation.

1



NL

Item #	Defect and Corrective Action Required	Date Due	Date Corrected	Corrective Action Description (attach additional documentation as necessary)

(Attach additional sheets if necessary)

I certify under penalty of law that the information contained herein is true, accurate and complete to the best of my knowledge and belief.

Name of PWS Owner/Representative: (Please Print)

PWS Owner/Representative: X

Date:

AGENCY USE ONLY: Date received: _____

Agency Reviewer: _____

State Agency Designee Lead Assessor: (Approved) _____

To return to compliance, the above named public water system is required to correct the sanitary defects outlined in this document.
Failure to comply will result in a violation.

What if nothing is found?

- It is possible that even after conducting an assessment, the cause of the positive sample cannot be conclusively linked to a given sanitary defect due to the complexity of the distribution system configuration and transport of contaminants throughout the system. In this case, water systems must document this conclusion in their assessment form. The primacy agency may require that the system provide them with supporting documents to back up its conclusion.

Best Available Technologies (BATs)

- Actions to ensure public health protection
 - generally do not involve major construction or capital improvement
- Long-term sustainability
- Public Health Protection

Best Available Technologies

- To Name a Few
 - Source protection
 - Fencing around collection area
 - Distribution protection
 - Flushing programs
 - Disinfection (increase residual?)
 - Repair and replace schedules
 - Sampling
 - Evaluate sample sites
 - Remedial staff training on proper sampling procedures
 - Collecting additional investigative samples (non-compliance)



Wrapping it Up

- Completed by Agency Designee
 - Qualified NDEP or County Contracted Personnel
- Additional Staff
 - Nevada Rural Water Association
 - Independent 3rd Party Professional
- Assignment criteria developed for Primacy Package
- Cost of Level 2 Assessment
 - NDEP or County Staff do not charge
 - Cost to water system
 - Additional samples
 - Independent professionals may charge
 - Contract operator time on-site





Seasonal Systems

Under RTCR

Seasonal System Definition

- Non-Community System
- Not operated as a PWS year-round
- Example: JJ's Mini golf
 - Owners/managers live on-site
 - Open to public from May to November
 - Other months are NOT a public water system

Example

- JJ's Mini golf
 - Owners/managers live on site year-round
 - Open to public from May to November
 - Other months December through April, closed to the public
- Camp Fleur de Lis
 - June to September 24-7 operation full service
 - October to April “casual operation”
 - Facility available to public
 - No water provided.

Seasonal Systems?



How About

- Partial shutdown
 - All but 1 campground loops closed
 - Satellite restrooms closed
 - Camping on Loop A still open. Distribution system supplying water to one restroom and some hydrants but closed loops and depressurized satellite restrooms to protect from freezing.



Seasonal Systems

Federal Regulation 141.854(i)

- Procedure for startup of operation
- Certification
- Regulatory Approval

Primacy Requires:

- Start-up SOP to address
 - Significant Deficiencies or CAP
 - Current on monitoring
 - Confirmation sample(s)



How it Works



Seasonal Start-up Procedure

- May Use Template
- Must Address
 - Outstanding Deficiencies
 - Monitoring Compliance
 - Flushing
 - Inspection
 - Source
 - Storage
 - Treatment
 - Distribution



Seasonal Start-up Procedure

- Must Address
 - Disinfection
 - How will disinfection be accomplished if needed
 - Compliance Sampling
 - Systems maintaining pressure year-round – 1 coliform sample
 - Systems depressurizing – 2 coliform samples (minimum)
 - Taken on consecutive days
 - Annual Checklist Submission
 - Include coliform results
- May Include Season-End Shutdown
 - Recommended



Start-up Checklist

- Follow SOP
- Comments
 - Meter Readings
 - Repairs/Corrections
 - System Modifications
 - Disinfection (if needed)
- Signature certifies that approved SOP was followed
- Submit to Agency with Coliforms

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
Bureau of Safe Drinking Water
Seasonal Water Systems Start-Up Checklist

This checklist will guide you through the process of reactivating/recharging your water system and help identify potential problems that may allow contamination to enter. If an item below is checked "No," it means improvements are needed. If you're unsure of what improvements to make, contact the Bureau of Safe Drinking Water (BSDW). Completion of this form will document that the following components of your water system were checked during start-up. **Write the date that each item was completed and send this signed, dated, and certified checklist to BSDW.** Retain a copy for your records and use during system shutdown.

Water System Name: _____ Water System Number: _____

INSPECT SYSTEM	Startup		Shutdown	
	YES/NO	Date	PWS Use Only YES/NO	Date
Source				
Record starting and ending meter readings or "N/A" if system does not have a master meter.	☐		☐	
Pressure gauge reads zero when pump off.	☐		☐	
Screens intact?	☐		☐	
Seals intact?	☐		☐	
Electrical lines intact?	☐		☐	
Other components inspected? List below:	☐		☐	
Use this box to explain repairs/corrections to items above.				
Storage				
Tank integrity solid (no leaks, holes in tank or vent...)?	☐		☐	
Vents screened with 22-24 mesh screen?	☐		☐	
Overflow area clear and not submerged?	☐		☐	
Hatch watertight and gasket intact?	☐		☐	
Other components inspected? List below:	☐		☐	
Use this box to explain repairs/corrections to items above.				

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Pressurized Systems

- **Must Address**
 - Significant Deficiencies
 - Current Monitoring
 - 1 clean sample prior to opening, taken at Routine location.
- **Specific to PWS**
 - Flush → Inspect → Repair → Sample → Submit
 - Obtain Agency concurrence.
- **Yearly Submit Checklist and Coliform Results**
 - Open with agency approval.
 - Sample monthly throughout the operating season.



De-Pressurized Systems

- **Must Address**
 - Significant Deficiencies
 - Current Monitoring
 - Clean samples on 2 consecutive days, taken at designated location(s).
- **Specific to PWS**
 - Flush → Disinfect → Inspect → Repair → Sample → Submit
 - Obtain Agency concurrence.
- **Yearly Submit Checklist and Coliform Results.**
 - Open with agency approval.
 - Sample monthly throughout the operating season.



Year-Round -- Limited Operations

- Loss of Pressure Regulation
 - Not Seasonal due to 12-month Operating Period
 - Flush → Disinfect → Inspect → Repair → Sample
 - 2 consecutive days of clean samples.
 - FM decides locations of clean samples.
 - No Tracking Process
 - Compliance determined by Facility Manager

Wait for Agency Approval

- Do not assume!
- May open facility if water unavailable
- Water distribution prior to receiving approval is a violation.
- Seasonal Systems All Sample Monthly
 - No exceptions.
 - Every month serving water





Compliance Recap

Are We Good?

Sample Compliance

- Two total coliform hits or 5% of total monthly samples
 - Treatment Technique
 - Assessment
 - Corrective Action
 - NTNC and CWS Report in Consumer Confidence Report
- One total coliform + one E. Coli (received in any order)
 - Acute MCL Violation
 - Boil Water Order
 - Level 2 Assessment
 - Violation on Record
 - NTNC and CWS Report in Consumer Confidence Report



Treatment Technique Compliance

- Assessment – Find and Fix Approach
 - Corrective Actions
 - Communicate
 - Submit to Regulator
- Start-up
 - Follow Procedure
 - Collect Samples
 - Checklist to Regulator
 - Await Approval





Contact

- <http://ndep.nv.gov/bsdw/index.htm>
- Bureau of Safe Drinking Water
 - 775-687-9521
- Margie Evans, RTCR Rule Manager
 - mevans@ndep.nv.gov
- Your Facility Manager

