

UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY

**DRINKING
WATER**

Disinfection Deep Dive
Utah Division of Drinking Water



Ryan Dearing

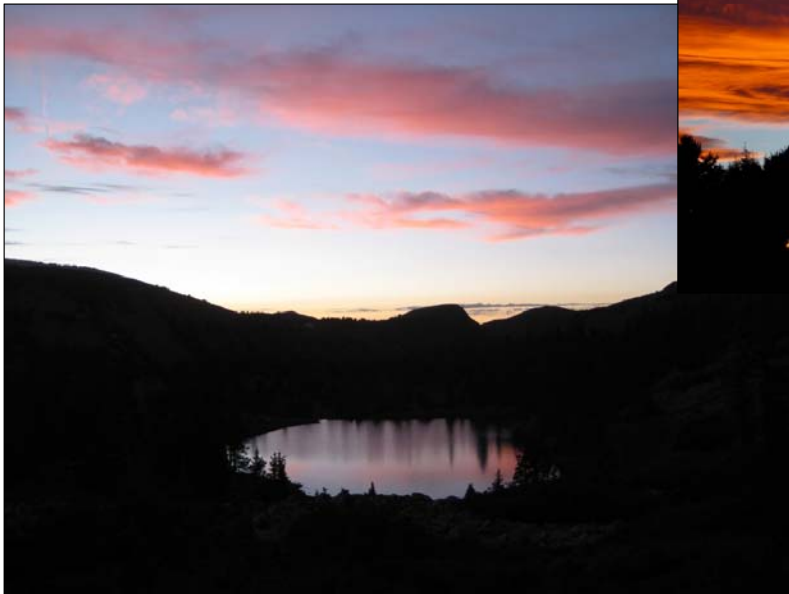
Technical Assistance - Emergency Response

801-536-0048

rdearing@utah.gov

DDW Emergency Response number

801-560-8456



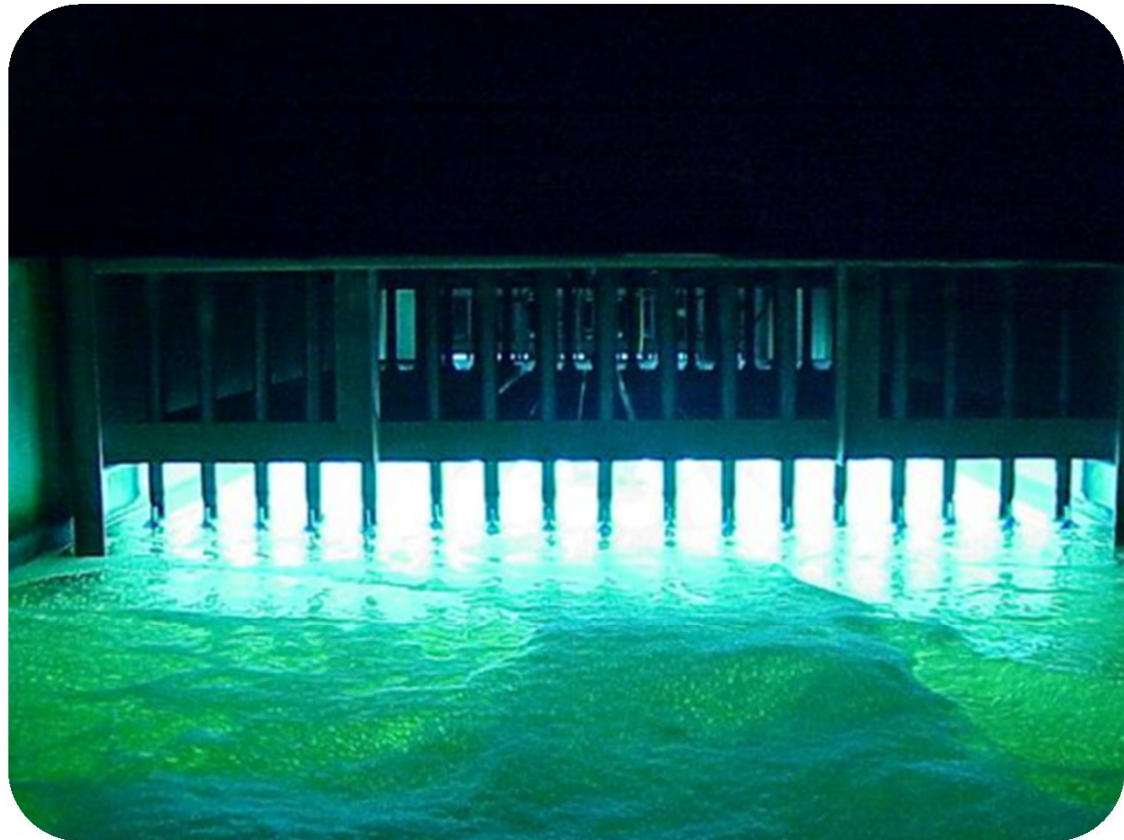
Common Methods of Disinfection

Chlorine

Ozone

Chlorine Dioxide

UV



5 Principles of Chlorine Disinfection

Concentration

Contact time

Temperature of the water

pH of the water

Foreign substances in the water

Turbidity

Chlorine is effective **only if it comes in contact** with bacteria

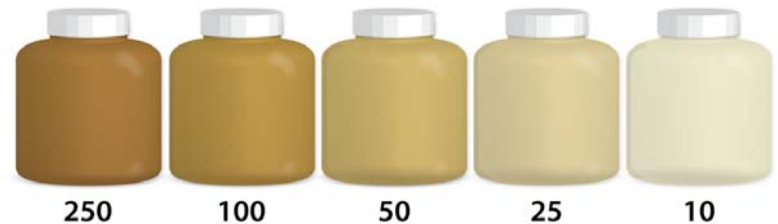
Turbidity can **prevent good contact time** and protect pathogens

MCL **5.0** NTU for groundwater



Turbidity (NTU)

Water Samples:



Chlorine Types



Tablet



Gas



Liquid



On-site generation

Approved Products



Certified to
NSF/ANSI 60

Chlorinator Types



← Gas

Liquid
(Sodium hypochlorite) →



← Tablet
(Calcium hypochlorite)

Gaseous Chlorine



Required Equipment

- Scale
- Ventilation
- SCBA (or access to)
- Cylinder restraints
- Repair kit (or access to)

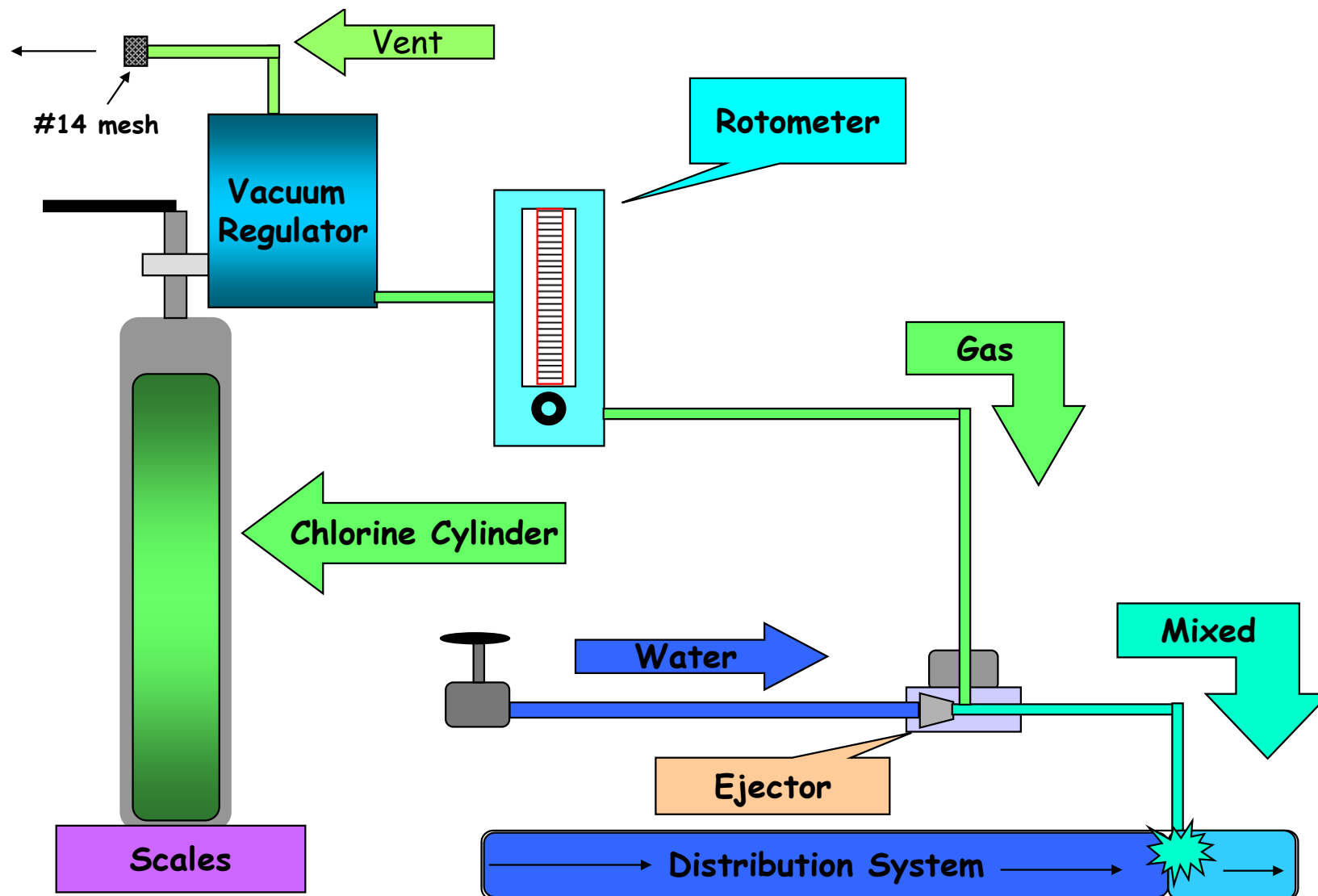
150 lb Cylinders



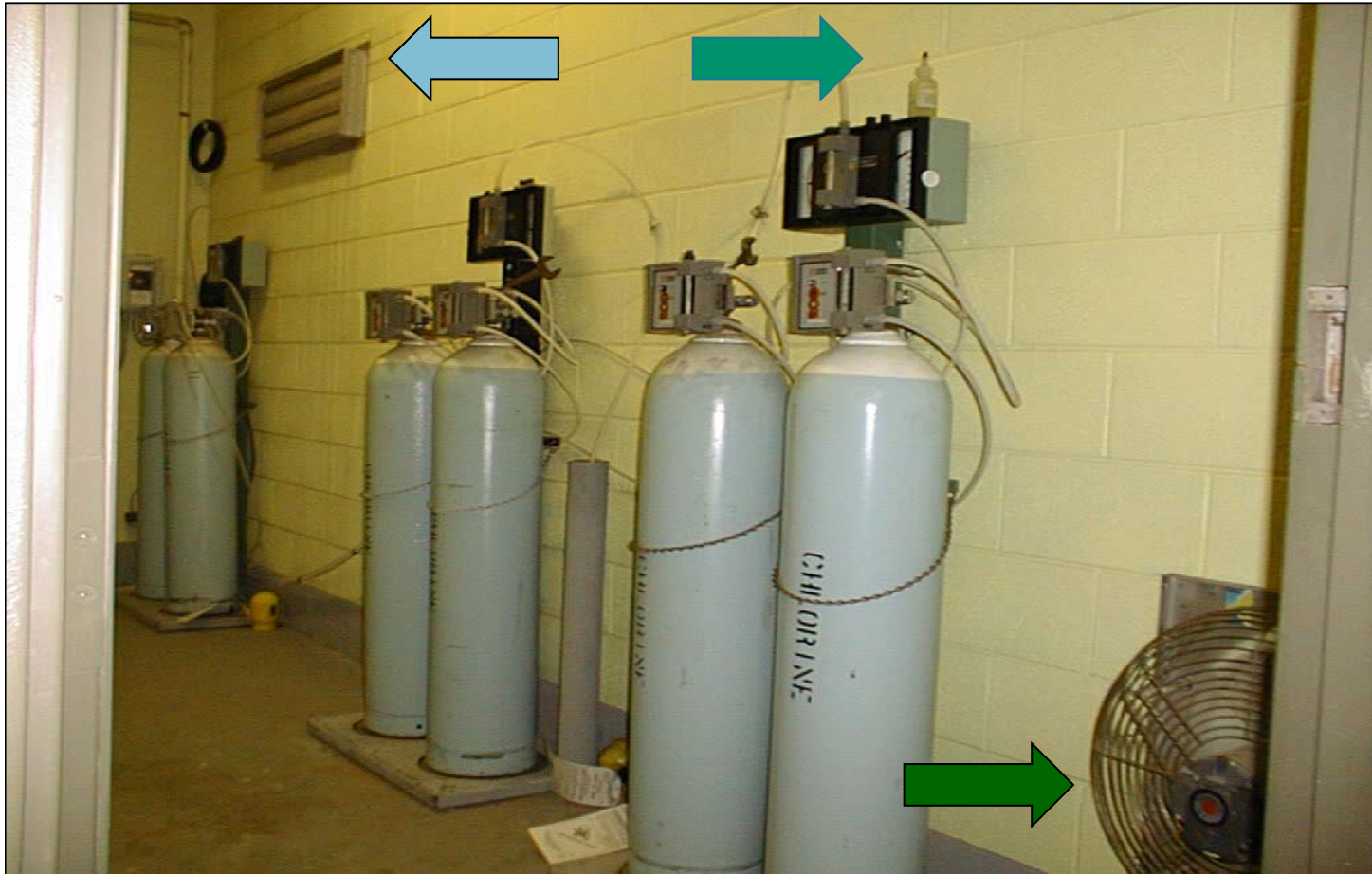
One Ton Cylinders



Gas Chlorinator



Chlorine Room - Gas



Note air intake at top, exhaust fan at bottom, ammonia bottle for checking leaks (vapors look like white smoke).

Repair Kits

A kit for 150 lb.



B kit for ton cylinders



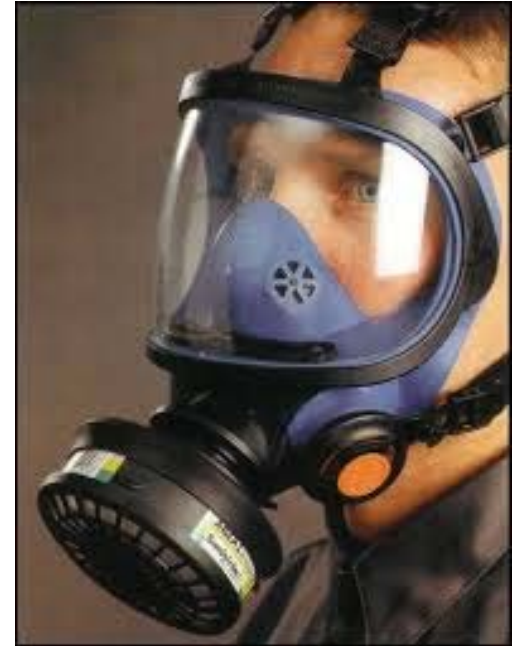
Respirators

Canister type masks should be worn during the changing of cylinders

Canister type masks should be used only for **escape purposes only**

SCBA's or fresh air masks should be worn for repairs, troubleshooting, and finding leaks

Should be stored near, but not in chlorine room!



Chlorine Room - Tablet



Chlorine Room - Liquid



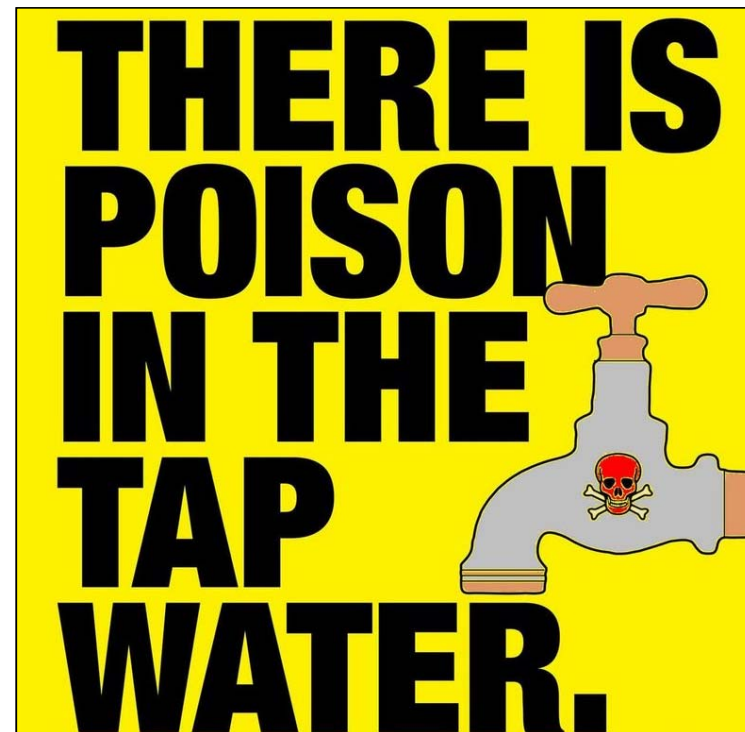
Chlorine Room - On-Site



Chlorine Monitoring

How much Chlorine is added?

Don't set it and forget it!



Water Needs to be Metered



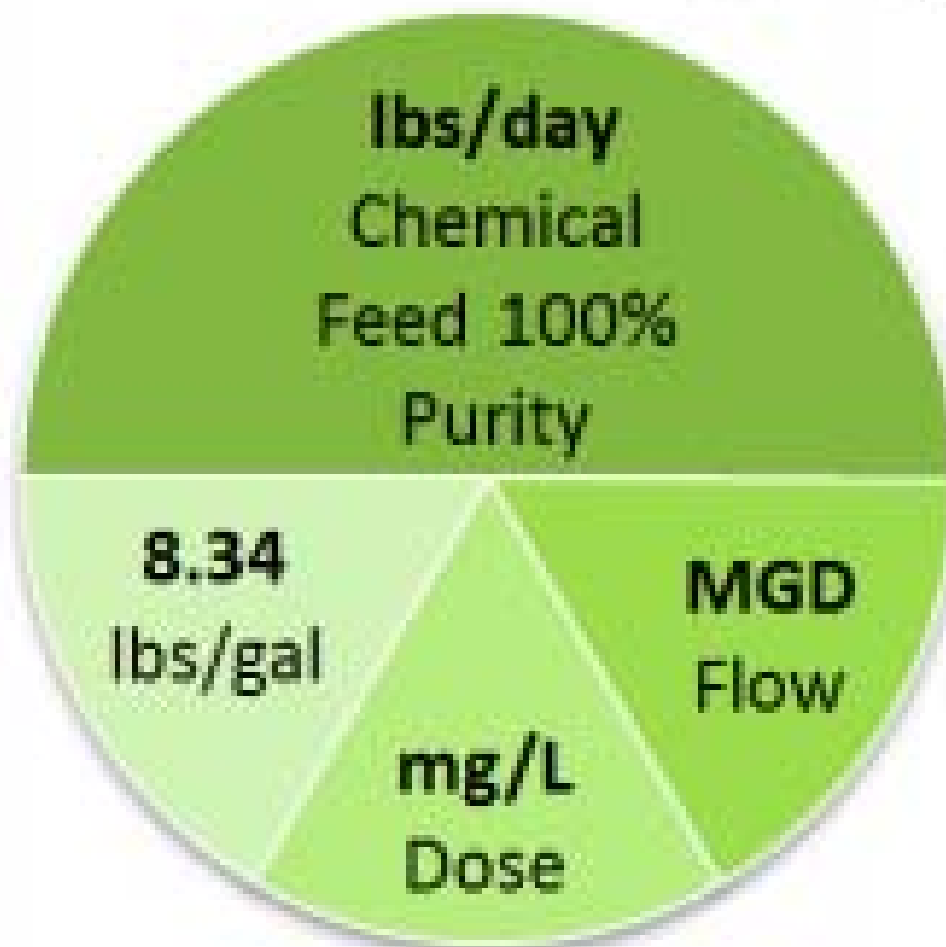
Measure Chlorine

- Pounds of Gas
- Level of Liquid
- Number of Tablets



Calculate Dose

Feed Rate, lbs/day



Measuring Residual



Chlorine Reporting

Reports

How much is added?

Quarterly Chlorination Report

How much remains?

Dist. Sys. Chlorine Residuals Online

DW Links

DDW Home

[Shopping Cart](#)

[For Consumers](#)

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[Operator Certification](#)

[Compliance](#)

[Permitting](#)

[Training](#)

[WaterLink](#)

[Forms](#)

[Laws & Rules](#)

[Contacts](#)

News & Announcements

- [New Water Use Data Collection and Reporting Systems \(2018 Revisions to Utah Code 19-4 \[H.B. 2018-001\]\)](#) (04/26/2018)
- [Lead Sampling in Schools](#)
- [Monthly Webinars](#)
Join us LIVE every month!

Public Notices

- [Adoption of Amendment to R309-500](#)
The Division of Drinking Water adopted an amendment to the rule R309-500, which relates to the public notice requirements for the adoption of a rule.


Water System Resources

Chlorine Reporting

- [Report Dist. Sys. Chlorine Residuals Online](#)
- [Quarterly Chlorination Report](#)

GRAMA Requests


Can't find the documents you're looking for using [EZ Request](#)? Have questions about GRAMA Requests? Call 801-419-4190.


**WaterLink**

Chlorine Reporting

Quarterly Chlorination Report

- ✓ Select type of chlorination
- ✓ Complete Daily Information

 DRINKING WATER		Quarterly Report for DBP Rule Compliance: Surface Water & Ground Water System Disinfection				
Month:		System Name :				
Year: 2018		System # :				
Chlorinator Location:		Prepared by :				
<i>NOTE: These readings must be done a minimum of 3 times per week</i>						
Disinfectant Type:		Chlorine Gas			Point-of-Entry Chlorine Residual	Distribution System Chlorine Residual
Day	Reading on Water Meter Totalizer	Volume of Treated Water (gallons)	Setting of Rotometer Valve	Gross Weight of Chlorine Cylinder (lb)		
1						
2						
3						
4						

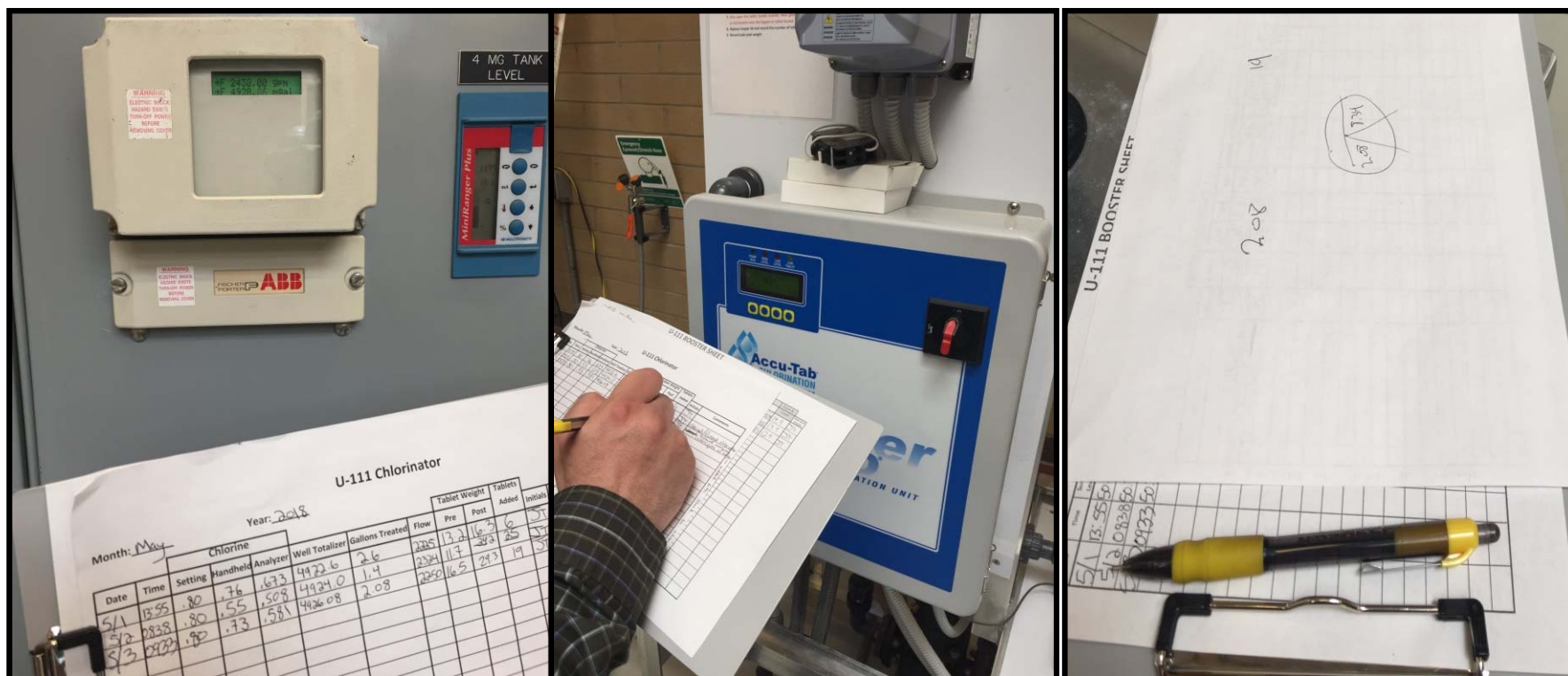
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1						
2						
3						
4						
5						
6						
7						

Chlorine Reporting

Quarterly Chlorination Report

Questions to ask:

- ✓ Show me where you collect the information?
- ✓ How do you know what dose?



Chlorine Reporting

Dist. Sys. Chlorine Residuals Online

- ✓ Test chlorine residual in distribution system at least 3 times a week.
- ✓ Record residuals on operations report.
- ✓ Calculate monthly average.
- ✓ Submit monthly average.

DRINKING WATER Quarterly Report for DBP Rule Compliance:
Surface Water & Ground Water System Disinfection

Month: _____ System Name: _____
 Year: **2018** System #: _____
 Chlorinator Location: _____ Prepared by: _____

NOTE: These readings must be done a minimum of 3 times per week

Disinfectant Type: **Chlorine Gas**

Day	Reading on Water Meter Totalizer	Volume of Treated Water (gallons)	Setting of Rotometer Valve	Gross Weight of Chlorine Cylinder (lb)	Point-of-Entry Chlorine Residual	Distribution System Chlorine Residual
1						
2						
3						
4						

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
DRINKING WATER

Chlorine Report Submission

** Required*

Email address *
 Your email _____

System Number *
Format must be UTAH03004
 Your answer _____

Reporting Year *
 Choose ▾

Reporting Quarter *
☐ 1st Quarter (January 1st-March 31st)
☐ 2nd Quarter (April 1st-June 30th)

Sanitary Survey – General Disinfection

GENERAL DISINFECTION

60. Water system follows AWWA disinfection procedures for new, repaired, or seasonal water mains and tanks.

SIG - 10pts - MR - D018 - DOES NOT USE AWWA DISINFECTION STANDARDS : R309-550-8(10) - R309-550-8(10) states that all new and repaired water mains, appurtenances, reservoirs and seasonal operating systems shall be disinfected in accordance with AWWA Standard C651. 10 demerit points shall be assigned.

Comments:

61. How often do you periodically disinfect all or any parts of your water system (ie batch disinfection) other than for repairs or maintenance?

SIG - 35pts - TR - TD25 - CL2 DISINFECTION PROCESS NOT CONTINUOUS: R309-200-5(7) - Rule requires continuous disinfection of groundwater sources that do not consistently meet bacteriological quality standards, all surface water sources, and groundwater sources under the direct influence of surface water. This significant deficiency must be corrected within 120 days of notification or have a compliance action plan approved by DDW.

Comments:

Survey Sections:

General Disinfection

Refresh Survey

Mailed and Lock

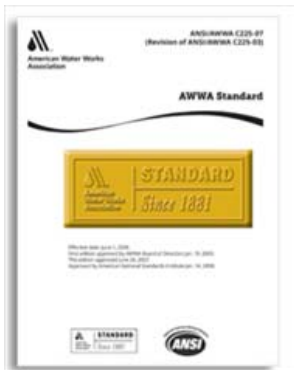
Survey Deficiency PDF

Survey PDF

General Disinfection



- AWWA C651-
Disinfecting Water Mains



- AWWA C652 –
Disinfection of Water Storage Facilities



Sanitary Survey – Batch disinfection

GENERAL DISINFECTION

60. Water system follows AWWA disinfection procedures for new, repaired, or seasonal water mains and tanks.

SIG - 10pts - MR - D018 - DOES NOT USE AWWA DISINFECTION STANDARDS : R309-550-8(10) - R309-550-8(10) states that all new and repaired water mains, appurtenances, reservoirs and seasonal operating systems shall be disinfected in accordance with AWWA Standard C651. 10 demerit points shall be assigned.

Comments:

61. How often do you periodically disinfect any or all parts of your water system (ie batch disinfection) other than for repairs or

SIG - 3 pts - MR - D019 - DISINFECTION PROCESS NOT CONTINUOUS: R309-200-5(7) - Rule requires continuous disinfection of groundwater sources that do not consistently meet bacteriological standards, all surface water sources, and groundwater sources under the direct influence of surface water. This significant deficiency must be corrected within 120 days of the survey date with a corrective action plan approved by DDW.

-
- 0 - 2 times per year
- 3 - 4 times per year
- 4 - 6 times per year
- every month

Survey Sections:

General Disinfection

Refresh Survey

Mailed and Lock

Survey Deficiency PDF

PDF With Reg

PDF No Reg

Validate

Save

0 of 11 Section(s) completed

Questions?

