



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Safe Drinking Water

Disinfection Requirements Rule

Small Water Systems TAC Meeting

July 13, 2017

Tom Wolf, Governor

Patrick McDonnell, Secretary

Additional Data

- Data reported to PADWIS
 - Entry Point (EP) Disinfectant Residuals
 - Average Distribution System Disinfectant Residual
 - Other Individual (non-EP) Disinfectant Residuals
- Data from DEP's Distribution System Study
- Data provided during public comment period
- EPA data – from ECHO and Third Six-Year Review

CWS Data Reported to DWELR

- **Entry Point (EP) Disinfectant Residuals**
 - Required under SWTR & GWR
 - Since Jan 1, 2016
- **Average Distribution System Disinfectant Residual**
 - Required under SWTR & DBPR
 - Since Jan 1, 2012
- **Other Individual (non-EP) Disinfectant Residuals**
 - Voluntary; includes sample types D, C, P, R
 - Since Jan 1, 2012

▶ Entry Point Disinfectant Residuals

- Data for CWSs from Jan 1, 2016 - present
- 196,823 records reported on SDWA-1 form
- 575 reported a result < 0.20 (0.29%)
 - 98 reported a result = 0.2
 - 477 reported a result < 0.2 (0.24%)

Average Disinfectant Residuals

- Data for CWSs from Jan 1, 2012 - present
- 130,408 records reported on SDWA-S form;
Of these, 2,763 reported a result < 0.15 (2.11%)
- 81,883 reported the “No. Required” as ≤ 1
Of these, 2,175 reported a result < 0.15 (2.65%)

Individual (non-EP) Disinfectant Residuals

- Data for CWSs from Jan 1, 2012 – present; 64,556 records reported on SDWA-1 form
- 3,795 check samples; 1,786 results < 0.15
- 58,012 distribution samples; 1,806 results < 0.15
- 765 special samples; 53 results < 0.15
- 1,980 plant samples; no results < 0.15
- 4 raw (source) samples; 2 results > 0.15

DEP's Distribution System Study

- Sampled 12 CWSs from June-October, 2016
 - 11 using SW sources; 1 using GW/purchased SW
 - Sampled 6 sites for each PWS: near storage tanks, dead ends, anticipated high water age
 - Field measurements for: temp, pH, Free/Total chlorine OR Total chlorine/monochloramine & free ammonia, Mn quenched free chlorine
 - Lab analysis for: Fe, Mn, NTRT, TTHM/HAA5, TC/EC, HPC & Legionella
- 6 use free chlorine; 6 use chloramines

DEP's DS Study – Free Chlorine

- Disinfectant Residuals
 - 36 measurements; range was 0.01-1.83; 10 sites < 0.15
 - 30 quenched residual measurements 0.00-0.22 (2 > 0.1)
- Disinfection Byproducts
 - 21 TTHM samples > MCL (7 from sites with Cl_2 < 0.15)
 - 1 sample also > HAA5 MCL
- Microbial Data
 - 1 HPC > 3000; 1 TC at 22
 - Legionella absent in all but 1 sample

DEP's DS Study – Chloramines

- Disinfectant Residuals
 - 36 measurements; range was 0.02-2.70; 7 sites < 0.15
 - 24 quenched residual measurements 0.00-0.07
- Disinfection Byproducts
 - 5 TTHM samples > MCL (2 from sites with CL_2 < 0.15)
 - None > HAA5 MCL
- Microbial Data
 - 1 HPC = 1000 (TC/EC & HPC all ND)
 - TC/EC & Legionella absent in all samples

Data from Public Comment Period

- Disinfectant residual sample results
- Coliform sample results
- Summary data from detection limit study
- Additional cost estimate information for capital improvements

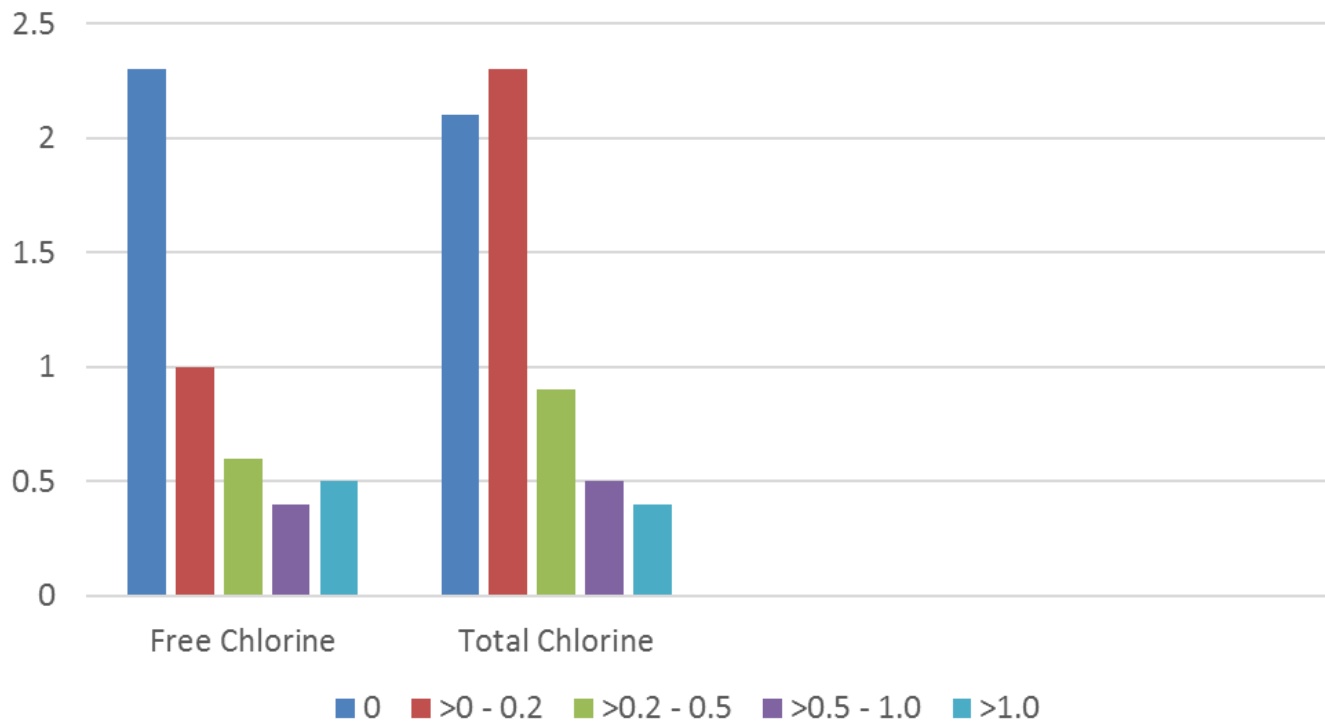
EPA's Third Six-Year Review

National microbial sample results and disinfectant residual data (2006-2011)

- ~ 2.6 M records with free chlorine residual
- ~ 1.4 M records with total chlorine residual
- ~ 770,000 records with both

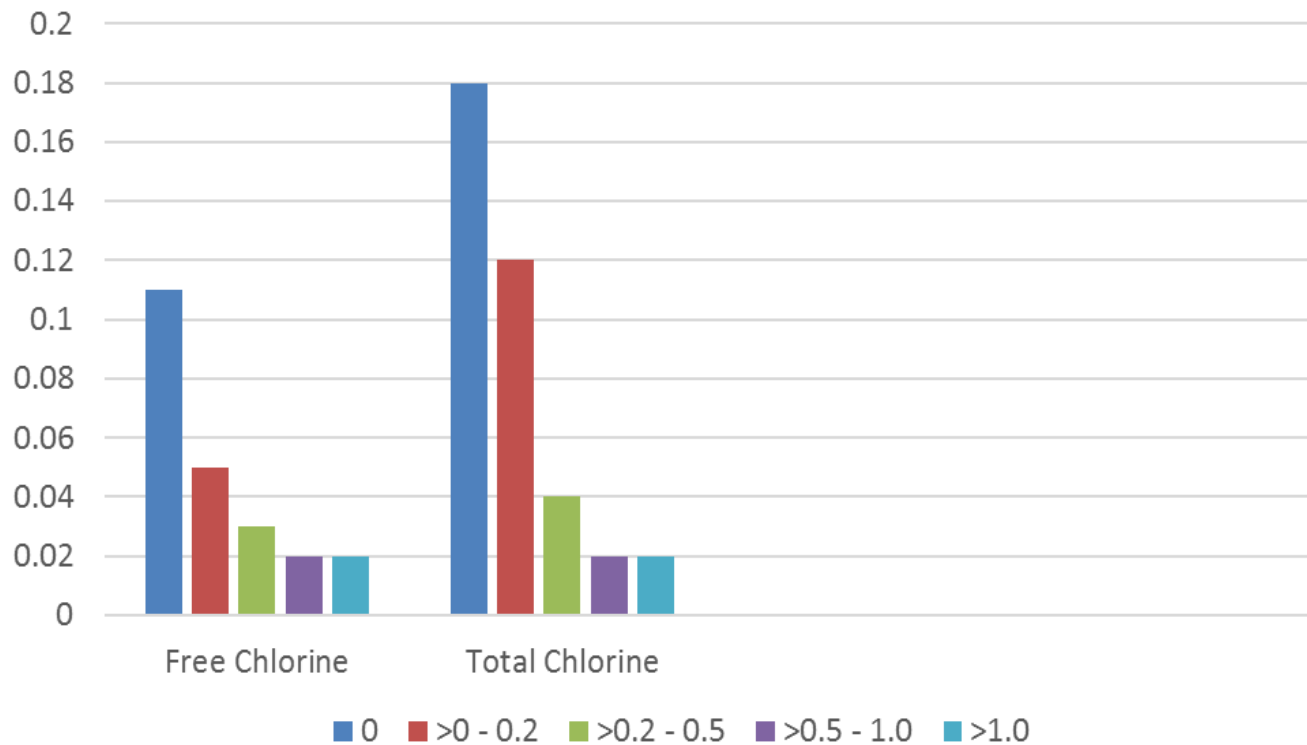
EPA's Third Six-Year Review

Total Coliforms – Percent (%) Positive
(Routine Samples)



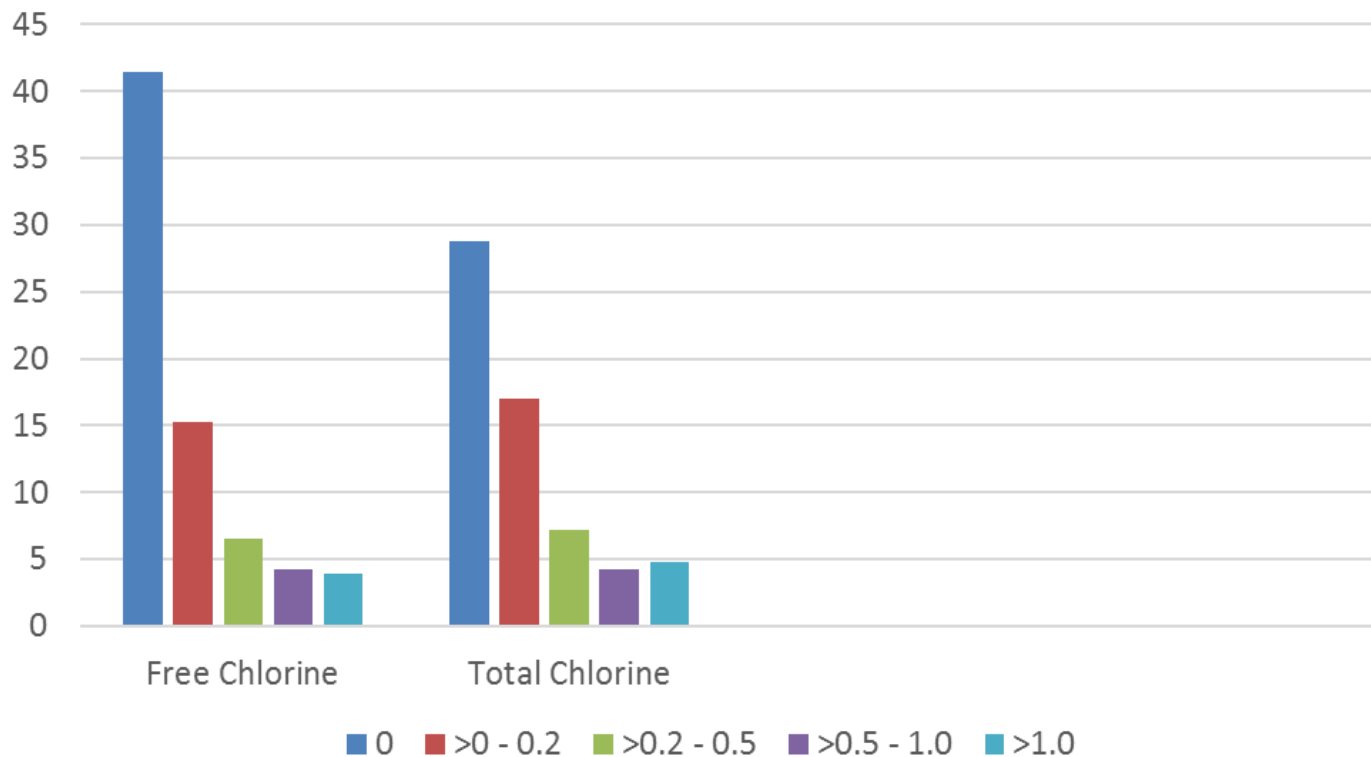
EPA's Third Six-Year Review

Fecal Coliforms/*E. coli* – Percent (%) Positive
(Routine Samples)



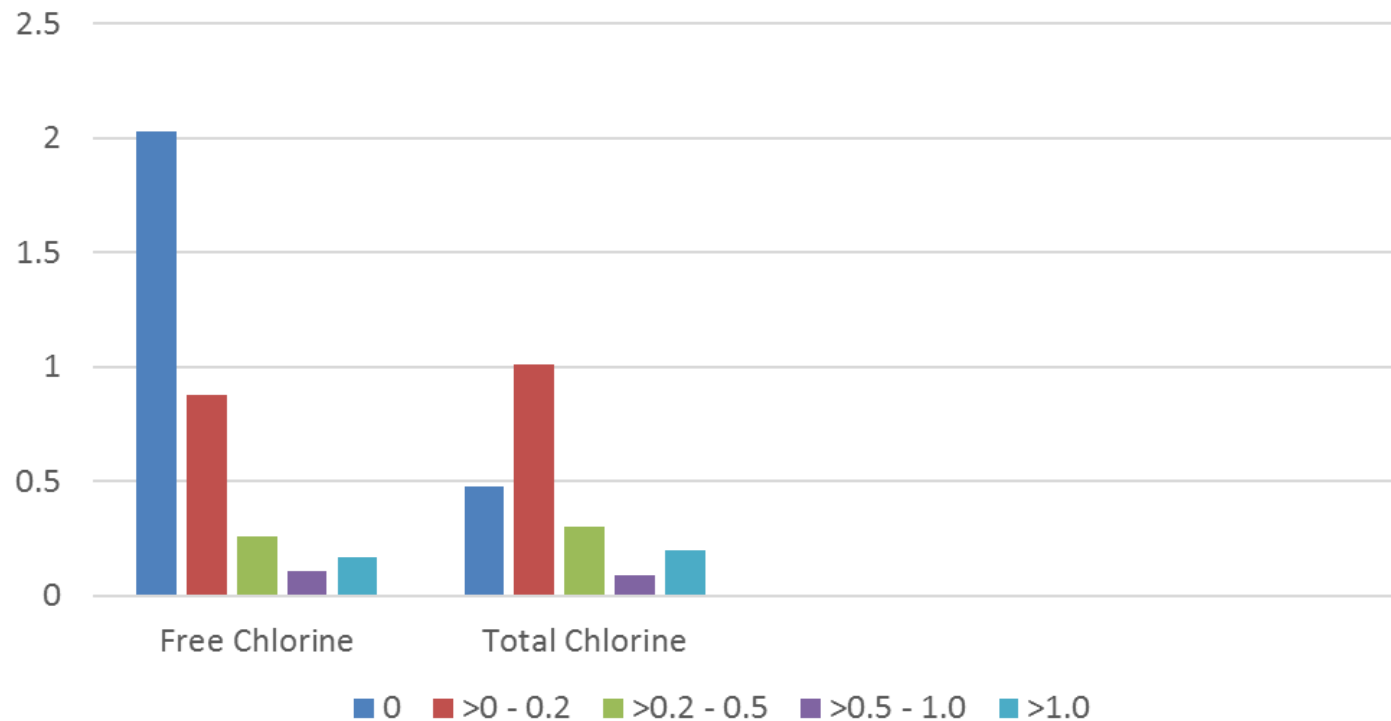
EPA's Third Six-Year Review

Total Coliforms – Percent (%) Positive
(Repeat Samples)



EPA's Third Six-Year Review

Fecal Coliforms/*E. coli* – Percent (%) Positive
(Repeat Samples)



EPA's Third Six-Year Review

EPA found there was lower rate of occurrence of Total Coliform and Fecal Coliform/*E. coli* positives as free or total chlorine residual increased

- Relationship was similar to results reported by Colorado study
- Consistent with findings of LeChevallier et al. (1996) RE: 0.2 mg/L (F) & 0.5 mg/L (T)

EPA's Third Six-Year Review

EPA evaluated information related to the maintenance of a minimum disinfectant level in the distribution system and determined that a detectable concentration may not be adequately protective of public health due to microbial pathogens. This is based on concerns about analytical methods and the potential for false positives.

Summary of DRAFT Revisions

- Defer implementation dates by 6 months for monitoring plans, and by 1 year for distribution system disinfectant residual requirements
- Add “expected” to peak hourly flow

Summary of DRAFT Revisions

- Clarify that Tier 1 PN is required when the EP residual drops below the minimum for 4 hours **AND** the minimum log inactivation is not met (or is not calculated)
- Revise BVRB monitoring requirements as per EPA comments



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QUESTIONS?

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