Discussion of Option Packages for CWS Serving < 1,000 (with analyses)

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This Presentation

Objectives

Provisions

System compliance

Improvement

Small CWS Options

Research

Objectives of Presentation

- Discuss and seek resolution of difference in options applicable to CWS < 1000
- Present results of analysis for CWS < 1,000 including:
  - Number of systems that would qualify for reduced monitoring under different criteria
  - Cost estimates
  - Breakdown by 9 categories (GW/SW, Disinfection Status, Population) provided in detail in appendix

Assumptions for Analysis

- Used option criteria to estimate number of systems doing reduced monitoring
  - All qualified systems are doing the reduced monitoring
- Cost estimates do not include any costs for demonstrating compliance with reduced monitoring with reduced monitoring criteria (e.g. site visit)
- All numbers presented in tables are based on data from current rule with no assessment or correction
  - Do not reflect impact of shifting to assessment paradigm

TCR Sample Unit Costs

System Size \ # Simultaneous Samples	5	4	3	2	1
≤100	$38.28	$39.46	$41.43	$45.37	$57.19
101-500	$39.31	$40.51	$42.50	$46.50	$58.48
501-1000	$47.58	$48.79	$50.81	$54.86	$67.01
1001-4100	$50.22	$51.47	$53.54	$57.68	$70.10
4100-33,000	$53.14	$54.41	$56.53	$60.78	$73.51
33,001-96,000	$57.16	$57.81	$58.89	$61.05	$67.54
>96,000	$71.90	$72.03	$72.25	$72.69	$74.01

Includes lab analytical costs, travel time to collect sample, shipping costs – see appendix for details

Number of CWS Systems < 1,000 by Subcategory

Population	Water Source	Disinfected (Yes/No)	Number of Systems
0 – 100	SW	Yes	1,142
0 - 100	GW	Yes	5,986
0 – 100	GW	No	5,908
101 – 500	SW	Yes	2,166
101 – 500	GW	Yes	9,005
101 – 500	GW	No	4,619
501 – 1,000	SW	Yes	1,319
501 – 1,000	GW	Yes	3,435
501 – 1,000	GW	No	1,022
Total			34,602

Reduced Monitoring Criteria

- Modeling reduced monitoring required use of several different data sources:
  - SDWIS database for MCL and M&R violations
  - 6-year review database for history of TC+
  - GWR EA for disinfection status
  - ASDWA / State data on sanitary surveys
  - State information on CCC programs

Number of Systems Qualifying for Reduced Monitoring (CWS provisions only)

Option	Provision	% Systems that Qualify	
		SW	GW
A	Protected GW, Clean SS	0	16 - 99
B & F	M&R 3-yr, no TC+ 3-yr, Clean SS	0	6 - 7
	GW < 1000 that disinfect	0	0 – 13
	GW < 1000 with no TC+ 3-yr	0	9 – 11
C	M&R 3-yr, no TC+ 3-yr, Clean SS, site visits	0	0
D	MCL 2-yr, M&R 2-yr, Clean SS, CCC prog.	0	0 – 8
E	Clean SS, MCL 1-yr, M&R 1-yr, site visit	0	0 – 2
	Clean SS, MCL 1-yr, M&R 1-yr, site visit	0	1 - 2

Summary of Option Packages (all CWS < 1,000)

Option / Element	A (Current)	B	C	D	E	F
# Systems on Reduced Monit.	5,274	2,005 - 3,573	100	1,000	430 - 494	2,005 - 3,573
Routine Monitoring Costs /yr	$21.3M	$22.4M - $23.7M	$23.7M	$23.3M	$23.5M	$22.4M - $23.7M
Repeat Monitoring Costs /yr	$1.0M	$0.8M – $0.9M	$0.9M	$1.1M	$0.9M	$0.8M – $0.9M
Additional Routine Monit Costs /yr	$1.3M	0	$0.3M	$1.4M	$1,000 - $2,000	0
Repeats on Add'l Rout. Monit. Cost /yr	$0.4M	0	$70,000	$0.4M	0	0
# Systems Triggered Level 1	0 (1,911)	1,449 – 1,535	1,620	2,079	1,498 – 1,500	1,449 – 1,535
Assessment Costs /yr (Implemented)	0 ($0.2M)	$0.3M - $0.9M	$0.3M – $1.0M	$0.4M - $1.2M	$0.3M - $0.9M	$0.3M - $0.9M
PN Costs /yr *Non-acute + Acute	$0.5M*	$57,000	$43,000 - $46,000	$50,000	$62,000	$46,000
Total Annual Cost	$24.5M ($24.7M)	$23.5M - $25.5M	$25.0M - $25.7M	$26.6M - $27.4M	$24.7M - $25.3M	$23.5M - $25.5M

Details – Routine Monitoring (all CWS<1,000)

Option / Element	A (Current)	B	C	D	E	F
# Systems	34,602	34,602	34,602	34,602	34,602	34,602
# Systems Monthly	29,328	31,029 – 32,597	34,502	33,602	34,108 – 34,172	31,029 – 32,597
# Systems Quarterly	5,274	2,005 - 3,573	100	1,000	430 - 494	2,005 - 3,573
# Routine Samples Collected	373,033	391,597 – 415,224	414,422	407,221	411,269 – 411,787	391,597 – 415,224
Routine Monitoring Cost /yr	$21.3M	$22.4M - $23.7M	$23.7M	$23.3M	$23.5M	$22.4M - $23.7M

Details – Repeat & Additional Routine Monitoring (all CWS < 1,000)

Option / Element	A (Current)	B	C	D	E	F
# Systems	34,602	34,602	34,602	34,602	34,602	34,602
# TC+ in Routines	6,634	7,046 – 7,502	7,614	7,269	7,434 – 7,444	7,046 – 7,502
Repeat Monitoring Costs /yr	$1.0M	$0.8M – $0.9M	$0.9M	$1.1M	$0.9M	$0.8M – $0.9M
Add'l Routine Monit. Costs /yr	$1.3M	0	$0.3M	$1.4M	$1,000 - $2,000	0
Repeats on Add'l Routine Monit. Costs /yr	$0.4M	0	$70,000	$0.4M	0	0
Total Annual Monitoring Cost	$23.1M	$22.4M - $23.7M	$24.1M	$25.2M	$23.5M	$22.4M - $23.7M

Details – Assessment (all CWS < 1,000)

Option / Element	A (Current)	B	C	D	E	F
# Systems	34,602	34,602	34,602	34,602	34,602	34,602
# Systems with Level 1 Trigger	0 (1,911)	1,449 – 1,535	1,620	2,079	1,498 – 1,500	1,449 – 1,535
Level 1 Cost /yr (Impl.)	0 ($0.2M)	$0.3M - $0.9M	$0.3M – $1.0M	$0.4M - $1.2M	$0.3M - $0.9M	$0.3M - $0.9M
# Systems with Acute Violations	196	148 - 157	173	215	158 - 159	148 - 157
Public Notif. Cost for Non-acute /yr	$0.4M	0	0	0	0	0
Public Notif. Cost for Acute /yr	$57,000	$43,000 - $46,000	$50,000	$62,000	$46,000	$43,000 - $46,000

Detailed Breakdown (all CWS < 1,000)

* Includes only elements with costs shown

	Option / Element	A (Current)	B	C	D	E	F
	# Systems	34,602	34,602	34,602	34,602	34,602	34,602
	National Cost /yr *	$24.5M ($24.7M)	$23.5M - $25.5M	$25.0M - $25.7M	$26.6M - $27.4M	$24.7M - $25.3M	$23.5M - $25.5M
Non-Triggered Systems	System Monit. Cost /yr	$618	$638 - $677	$681	$675	$671	$638 - $677
	HH Monit. Cost /yr	$13	$13 - $14	$14	$14	$14	$13 - $14
Triggered Systems	System Monit. Cost /yr	$1,488	$845 - $886	$999	$1,540	$880 - $881	$845 - $886
	HH Monit. Cost /yr	$32	$18 - $19	$21	$33	$19	$18 - $19

Detailed Breakdown Continued (all CWS <1,000)

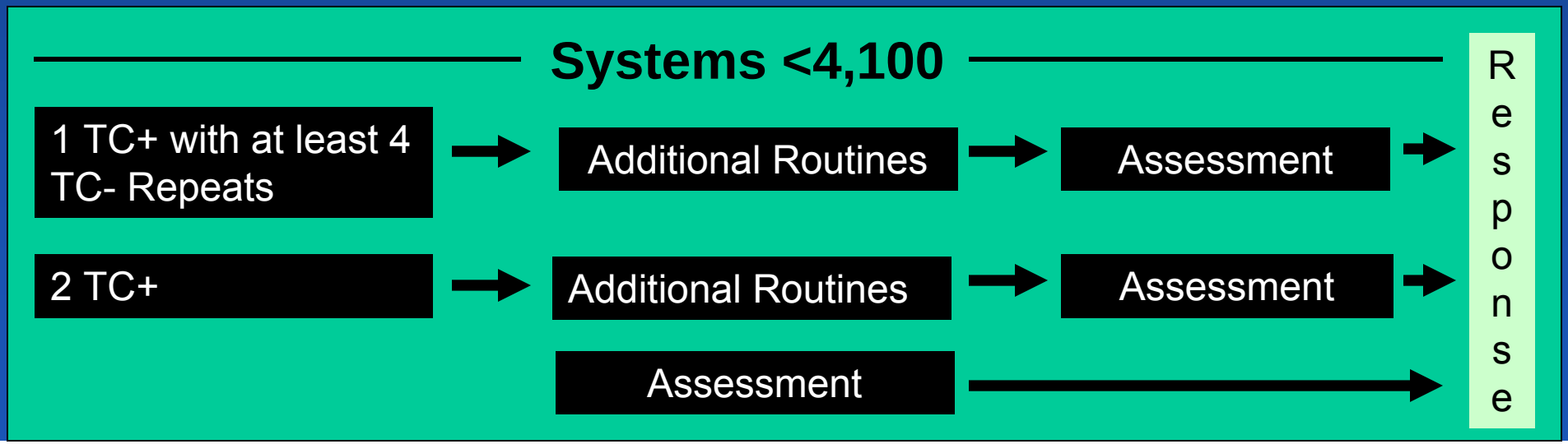
	Option / Element	A (Current)	B	C	D	E	F
	# Systems	34,602	34,602	34,602	34,602	34,602	34,602
Triggered Systems	System Assess. Cost /yr	($100)	$200 - $660	$200 - $660	$200 - $660	$200 - $660	$200 - $660
	HH Assess. Cost /yr	($2)	$4 - $6	$4 - $7	$4 - $8	$4 - $7	$4 - $6

Findings

- Routine and repeat monitoring costs are relatively close across all options
- The main difference in total cost and systems triggered between options is related to additional routines from current rule and Option D
  - Model results show detection of TC+ and acute violations from additional routine samples
- Household costs for routine/repeat monitoring without trigger range from $35 for SW CWS<100 to $2 for SW CWS 500 – 1,000
  - With trigger, range is from $69 for SW CWS < 100 to $3 for SW CWS 500 – 1,000

Items for Discussion

- How to address trade-offs between routine sampling, additional routines and impact of assessment?
- There are two scenarios to keep in mind when thinking through additional monitoring requirements:



Appendix

Assumptions on Unit Sample Costs

- Increased sample burden to account for travel time
  - ≤500: 0.5 hours/sample
  - 501 – 96,000: 0.75 hours/sample
  - >96,000: 1.0 hour/sample
- Updated labor rates to 2007 dollars
- Used $20.94 as average contractor lab analytical cost (based on quotes from labs in 9 states)
- Shipping 100 miles away
  - Most use ground shipping (50%)
  - Some using lab courier pick-up (20%), standard next day (12.5%), priority overnight (12.5%), and some delivering themselves (5%)
- In-house based on O&M cost + 0.5 hour x labor rate for given size category
- Same assumptions as before for in-house vs. contractor
  - ≤33,000: 100% contract lab
  - 33,000 – 96,000: 50% contract lab, 50% in-house
  - >96,000: 10% contract lab, 90% in-house

Delivery Assumptions for Unit Sample Costs

	Total Shipping Cost				
	1 sample	2 samples	3 samples	4 samples	5 samples
Courier	$3.50	$3.50	$3.50	$3.50	$3.50
Ground	$6.65	$6.77	$6.88	$7.00	$7.12
Std. Next Day	$38.48	$38.48	$38.48	$38.48	$38.48
Priority Overnight	$45.12	$45.12	$45.12	$45.12	$45.12

	Per Sample Cost				
	1 sample	2 samples	3 samples	4 samples	5 samples
Courier	$3.50	$1.75	$1.17	$0.88	$0.70
Ground	$6.65	$3.39	$2.29	$1.75	$1.42
Std. Next Day	$38.48	$19.24	$12.83	$9.62	$7.70
Priority Overnight	$45.12	$22.56	$15.04	$11.28	$9.02

Self-delivery depends on labor rate for given system size: Range of $184-238 for a single sample (per sample cost decreases when >1 sample is self-delivered)