

LT2 Round 1 *Cryptosporidium* Occurrence

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Outline

- *Cryptosporidium* Occurrence
 - ***Historical Data (next 4 slides)***
 - Round 1 Data
- Summary

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Historical Occurrence Data

- *Cryptosporidium* occurrence data used to develop the LT2 Rule and its Economic Analysis:
 - ICR Survey
 - ICR Supplemental Survey – Large (SS Large)
 - ICR Supplemental Survey – Medium (SS Medium)

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The Surveys

- **ICR** – All surface water and GWUDI systems serving at least 100K people tested sources monthly for 18 months using the ICR method. (Ended Dec. 1999)
- **SS Large** – The seven largest ICR systems plus a sample of 40 additional ICR systems tested twice per month for 12 months using method 1622/1623. (Ended Feb. 2000)
- **SS Medium** – A sample of 40 systems serving 10K to 100K tested twice per month for 12 months using method 1622/1623. (Ended Feb. 2000)

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Survey Summary Statistics for Occurrence

- ICR
 - 5838 source water measurements
 - 93% zeros (nondetects)
 - Average measured Crypto Conc. = 0.067/L
 - Average recovery was about 1/3 that for methods 1622 & 1623
- Supplemental Surveys
 - 2086 source water measurements
 - **86% zeros**
 - Average measured Crypto Conc. = **0.053/L**

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Survey Summary Statistics for Occurrence, continued

- ICR
 - 64 of 350 plants (18%) had means of at least 0.075/L
 - 196 plants (56%) had all-zeros
- Supplemental Survey
 - 12 of 87 plants (**14%**) had means of at least 0.075/L
 - 18 plants (**21%**) had all-zeros

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Outline

- *Cryptosporidium* Occurrence
 - Historical Data
 - **Round 1 Data (next 7 slides)**
- Summary

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Caveats

- October 2011 dataset is not final
 - Schedule 4 monitoring is still ongoing
- The Data Collection and Tracking System (DCTS) data don't include all "grandfathered" data used by some systems.
- Sources include some that are not filtered.
- Some records are missing info (schedule, source type, etc.)
- Schedule 4 systems are not representative of all small systems, due to use of *E. coli* trigger.

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Cryptosporidium Occurrence Summary Statistics Numbers of Systems, Facilities (Intakes), and Records

Schedule	Systems	Facilities	Records
1	229	365	9,854
2	175	237	6,195
3	756	838	21,814
4	189	197	4,234
NA*	27	33	813
Total	1,376	1,670	42,910

* NA = Not Available. Schedule information was missing.

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Cryptosporidium Summary Statistics Numbers of Sample Assays (Records)

Schedule	Records	Field	Matrix Spikes
1	9,854	9,128	726
2	6,195	5,725	470
3	21,814	20,160	1,654
4	4,234	3,907	327
NA*	813	756	57
Total	42,910	39,676	3,234

* NA = Not Available. Schedule information was missing.

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Cryptosporidium Field Summary Statistics

Schedule	Mean	% NonDetect
1	0.0117	93.9% (8,573 of 9,128)
2	0.0148	93.4% (5,347 of 5,725)
3	0.0166	93.2% (18,799 of 20,160)
4	0.0247	88.7% (3,464 of 3,907)
NA*	0.0201	90.7% (686 of 756)
All	0.0161	92.9% (36,869 of 39,676)

*NA = Not Available. Schedule information was missing.

For comparison, Supplemental Survey mean was **0.053/L** and **86%** were nondetects.

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Field Statistics by Facility

- Each "Facility" has a single drinking water source. (Some "systems" have multiple facilities.)
- 77 facilities each have fewer than 6 assays and are not included in the summary statistics that follow. (213 field records)
- 917 facilities have exactly 24 assays and use rolling annual average to determine bin.
- 113 facilities have 48 or more assays and use the average (mean).
- Statistics that follow use the mean for all facilities. The is expected to understate the numbers required to take action.

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Cryptosporidium Summary Statistics by FACILITY*

Schedule NA = not available	Number Facilities	No. With All- Nondetects (%)	No. at or Above 0.075 (%)
1	331	185 (56%)	11 (3.3%)
2	221	111 (50%)	7 (3.2%)
3	820	422 (51%)	37 (4.5%)
4	192	87 (45%)	19 (9.9%)
NA**	29	14 (48%)	1 (3%)
All	1,593	819 (51%)	75 (4.7%)

* Includes only facilities having at least 6 field measurements.

** NA = not available. Schedule was not specified.

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Cryptosporidium Summary Statistics by Water Type*

Water Type** NA = not available	Number of Facilities	No. with All- Nondetects (%)	No. At or Above 0.075 (%)
Res/Lake (LR)	709	451 (64%)	9 (1%)
River/Stream (FS)	615	204 (33%)	58 (9%)
Both (LR & FS)	56	26 (46%)	3 (5%)
GWUDI-FS	69	53 (77%)	0
GWUDI-LR	34	26 (76%)	2 (6%)
NA**	110	59 (54%)	3 (3%)
All	1,593	819 (51%)	75 (4.7%)

*GWUDI = ground water under direct influence

**NA = not available. Water Type was not specified.

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Outline

- Round 1 *Cryptosporidium* Occurrence
 - LT2 estimates
 - Round 1 data
 - **Summary (next slide)**

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Summary

- Compared with LT2 Estimates, overall occurrence is considerably less than expected:
 - More nondetects (**93%** vs. **86%**) → Fewer detects (**7%** vs. **14%**)
 - More plants with all-nondetects (**51%** vs. **21%**)
 - Lower overall average concentration (**0.016** vs. **0.053**)
 - Smaller % of source waters with mean concentrations of at least 0.075/L (**4.7%** vs. **14%**)
- Occurrence for Schedule 4 is significantly greater than for Schedules 1-3, suggesting that indicator screening is working.

Blue = DCTS Red = Historical (survey statistics)

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