Beyond RTCR Assessment Requirements: Identifying Microbial Contaminants to Suggest Corrective Actions

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Revised Total Coliform Rule

- Positive tests indicate the potential for fecal contamination, but do not identify contamination sources.
Well Assessments

• Assessments are triggered when a PWS has repeated total coliform presence in routine samples

• Goal: Identify potential contamination sources to determine need for further testing or to inform corrective action
Tier 1 Assessment - Processing Steps

Sample → (Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP) → Positive Results / Negative Results

- Positive Results: API 20E organism of concern → Tier 2
- Negative Results: Biofilm Issues → No further testing
Tier 2 Assessment - Large Volume Sampling

100 L Sample Water

Dead-end Hollow-Fiber Ultrafiltration (HFUF)

Concentrated Microbial Biomass

Waste Water (99 L)
Tier 2 Assessment - Processing Steps

Sample → Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP

qPCR for organism of concern (Tier 1 API)

IDENTIFY SOURCES OF FECAL CONTAMINATION
- Human Adenovirus
- Bifidobacteria spp.
- Rhodococcus coprophilus
- Bacteroides spp.
- Toxigenic E. coli (STEC)
- E. coli O157:H7

Results to WDNR → well owners

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Corrective Action

- Once a contamination source is identified, well owners work with WDNR to come up with a plan for corrective action
Future Directions - Biofilms

Tier 1 Assessment

Sample ➔ Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP

Positive Results ➔ Biofilm Issues ➔ X ➔ No further testing

Negative Results ➔ Tier 2

API 20E

organism of concern
Future Directions - Biofilms

Tier 1 Assessment

Sample → Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP

Positive Results → Biofilm Issues

Negative Results → No further testing

Tier 2

API 20E

organism of concern
Future Directions – *Mycobacterium spp.*

- Nontuberculous *Mycobacterium spp.* (NTM) Lung Disease
- Common in Environment
- Common in Household Water
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- Nontuberculous *Mycobacterium spp.* (NTM) Lung Disease
- Common in Environment
- Common in Household Water
- Biofilms
  - Difficult to Remove
Future Directions – *Mycobacterium spp.*

- Nontuberculous *Mycobacterium spp.* (NTM) Lung Disease
- Common in Environment
- Common in Household Water
- Biofilms
  - Difficult to Remove
- Next-generation Sequencing
Contact

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