Ground Water Rule
“The Utility Perspective”

July 17, 2009

Jeffrey J. Haby, P.E.
San Antonio Water System
Ground Water Rule - Requirements

• Comprehensive Compliance Investigation (CCI) reviews and evaluates the adequacy of system sources and operations

• Source Water Monitoring
  – Triggered if positive coliform and system does not achieve 4 log inactivation
  – Assessment monitoring for wells without sanitary easements/construction data for well

• Operational Reporting will be required if 4 log inactivation is chosen as a treatment method
Production Well Locations

15 Primary Pump Stations

Isolated Stations

21 Secondary Pump Stations
Source Water Sampling

• Required unless the System provides 4-log treatment inactivation and was in compliance during the event
• The majority of SAWS Primary Pump Stations can achieve 4-log inactivation
• Secondary pump stations cannot - Raw water sampling required at the well
• Wells at 5 locations are sampled monthly to achieve compliance (Lackland City #3, Mission # 6 & 7, Turtle Creek #2, Gateway # 1 & 2, S&S Hills #4)
# Source Water Sampling

## Without 4-Log

<table>
<thead>
<tr>
<th>Route Number</th>
<th>Tract Sample Address</th>
<th>Tract Site ID</th>
<th>Source ID Sample Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7706 Maxwell</td>
<td>8705</td>
<td>Mission # 1 (G0150018M), Mission #2 (G0150018R), Mission #3 (G0150018Q), Mission #4 (G0150018R), Mission #5 (G0150018N), Mission #6 (G0150018O), Mission #7 (G0150018S), Market #1 (G0150018G), Market #3 (G0150018I), Market #4 (G0150018J), Artesia #3 (G0150018C), Artesia #4 (G0150018D), Artesia #5 (G0150018E), 34th St. #1 (G0150018W), 34th St. #2 (G0150018X), 34th St. #3 (G0150018Y), 34th St. #4 (G0150018AY), Marbach #1 (G0150018AG), Marbach #2 (G0150018AH), Marbach #3 (G0150018CY), Gateway #1 (G0150018BG), Gateway #2 (G0150018BH), Lackland #6 (G0150018AW), Lackland #6A (G0150018AX), Lackland City (G0150018AV)</td>
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Corrective Action

• No presence of *Fecal* indicator organism
  – No action
Corrective Action

• Presence of Fecal indicator organism
  – Issue acute MCL violation public notice within 24 hours
  – Obtain TCEQ directive regarding corrective action
    • Correct significant deficiencies
    • Provide alternative source of water
    • Eliminate source of contamination
    • Disinfect the well
    • Take the well off-line
    • 12-months of source sampling if well remains in service with public notice in effect
Challenges

Cost of additional sampling

– Manpower
  • Lab
  • Sampling
  • Operational
  • Modeling
– Modeling
– Lab expenses
– Training
– Public notice/education
Challenges Cont.

• Implement 4-Log at Primary Stations will require Operational Reporting (self-reporting)
• What if Utility cannot remove a well as corrective action
  – Public notice until corrective action is completed
• Impacts from Wholesale customers
What Have We Learned

- Training is going to be critical

- Dedicated sample sites for TCR samples should be considered
  - 08 we had 7 positives out of about 4,200
  - 09 five so far
  - 06 had a over 20

- Recommend 4-log inactivation if possible
  - Additional monitoring by control center and self reporting of operational excursions
  - Does eliminate sampling of most primaries if a positive in the Distribution System
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