Source Considerations and Source Water Protection
Purpose of the Ground Water Rule

Provide increased protection against microbial pathogens in public water systems (PWS) that use ground water (GW) sources.
Sources at Risk

- Well construction
- Hydrogeology
- Proximity to potential sources of fecal contamination
Well Construction

- Must comply with §290.41(c)(3) regulations
  - Driller’s log
  - Sanitary control easement
  - Proper casing
  - Annular cement (pressure)
  - Sealing block, security, proper grading
Hydrogeology

• Well depth, confining layers
• Well location
• Aquifer type
Well Depth

- Shallow wells may provide little attenuation
- Lack of sufficient confining layers that provide a barrier for vertical migration of contaminants
- Little or no soil
Well Location

- Distance to surface water features
  - Lakes, rivers, streams
  - Flood plain
Karst Aquifers

- Capitan
- Marble Falls
- Edwards - Trinity Plateau
- Edwards - Balcones Fault Zone
- Edwards - Trinity High Plains
- Ellenurger - San Saba
Karst Aquifers

- Limestone and dolomite
- High porosity due to solution cavities and fractures
- Little or no topsoil
- Large surface recharge features
Fractured Rock Aquifers

Fractured Rock Aquifers

Llano Uplift
Fractured Rock Aquifers

- Fractured bedrock
- High porosity due to fracturing
- Little or no topsoil
Alluvial Aquifers
Alluvial Aquifers

- Sand, gravel, clay
- Highly variable porosity
- Generally shallow wells
- Often near surface water
Volcanic Aquifers
Volcanic Aquifers

- High porosity, complex systems
- Little or no topsoil
Potential Sources of Contamination

• Point source
  – Below ground
  – Above ground
• Non-point source
• Other
Potential Sources of Contamination

- Septic systems
- Animal feeding operations
- Sludge application
- Sewage treatment plants
- Surface water bodies
- Abandoned wells
Septic Systems

- Septic systems can leach harmful bacteria to the groundwater
Animal Feeding Operations

- Highly concentrated source of fecal contamination
- Lagoons can potentially leak/overflow if not properly constructed/maintained
Abandoned Wells

- Act as a conduit for contaminants to enter the aquifer
Source Water Protection

- Survey potential sources of contamination
- Make system aware of activities around wellhead that can lead to contamination
- Recommend best management practices to eliminate/reduce risk
- Provide financial assistance