Water Quality Assessment in Texas
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Texas Surface Water Quality
- Federal Clean Water Act Sections 305(b) and 303(d)
- State of Texas has established Standards to protect the purposes for which waterbodies will be used
  - Designated Uses are assigned to each water body

Water Use Categories
- Aquatic Life Use
  - Designed to protect aquatic species
  - Dissolved Oxygen, Toxic Chemicals
- Contact Recreation
  - Estimates the relative risk of swimming and other water sports
  - Bacteria
- Public Water Supply
  - Indicator of whether water is suitable as use as a source for a public water supply system
  - Metals, Pesticides, Other Toxic Chemicals
- Fish Consumption
  - Protect public from consuming fish that may be contaminated
  - Metals, Pesticides, Other Toxic Chemicals

Water Quality Standards
- Used by TCEQ’s regulatory programs to establish reasonable limits on permitted dischargers
- Numeric Standards
  - Segment Specific Number
- Narrative Standard
  - Descriptive standards to protect aesthetics and designated uses
  - Screening Levels - non-segment specific numeric standard for nutrients

Criteria Applicable to Lake Granbury
- Numeric Criteria
  - Dissolved Oxygen
  - pH
  - Indicator Bacteria
  - Chlorides
  - Sulfates
- Narrative Criteria
  - Nitrite Nitrogen and Nitrate Nitrogen
  - Orthophosphate Phosphorus

Indicator Bacteria
- E. coli is measured to determine the relative risk of swimming
- Originate from the feces of warm-blooded animals
- Presence indicates that associated pathogens from the feces may be reaching the water
How Do We Know When Bacteria is Too High?

- 10-sample minimum
- Two Assessment Methodologies
  - Long Term Geometric Average
    - If geometric average exceeds 126 MPN/100ml then site is considered impaired
  - Individual Samples
    - If 25% or more of the samples exceed 394 MPN/100ml then site is considered impaired
- Site can be declared impaired by either method or both

Dissolved Oxygen (DO)

- Concentration correlated with the occurrence and diversity of aquatic life in water
- 10-sample minimum
- Average Daily Minimum Criteria – 5.0 mg/L
- If 10% or more of the samples are less than 5.0 mg/L then site is considered impaired

pH

- General water quality indicator
- Major factor affecting most chemical and biological reactions
- 10-sample minimum
- Absolute Minimum Criteria – 6.5 mg/L
- Absolute Maximum Criteria – 9.0 mg/L
- If 10% or more of the samples are less than 6.5 mg/L or exceed 9.0 mg/L then site is considered impaired

Chlorides (Cl) and Sulfates (SO₄)

- Highly impacted by watershed characteristics
- Chlorides
  - Maximum Criteria – 1,000 mg/L
  - If the average exceeds 1,000 mg/L then site is considered impaired
- Sulfates
  - Maximum Criteria – 600 mg/L
  - If the average exceeds 600 mg/L then site is considered impaired

Nutrients

- Fertilizing compounds which stimulate and sustain the growth and development of aquatic plants and algae
- Nitrogen (NO₂⁺NO₃)
  - Screening Level – 0.32 mg/L
  - If 25% or more of the samples are exceed 0.32 mg/L then concern
- Phosphorus (PO₄)
  - Screening Level – 0.05 mg/L
  - If 25% or more of the samples are exceed 0.05 mg/L then concern