Management of Manganese Backwash Water and Residuals
Groundwater Recharge Program

• Groundwater Discharge Permitting

• Nondomestic Wastewater Registration
  • Underground Injection Control Program
  • Nondomestic Wastewater
  • Water Treatment Wastewater
UIC & Nondomestic Wastewater (WW) Discharge Registration Sites

2387 Registered Sites
- 502 Water Treatment
- 1671 UIC wells
- 214 Nondomestic WW
Disposal of Water Treatment Discharges

- Municipal Sewer
- Dewatering Beds
- Subsurface Disposal
  - Leaching structures (fields, dry wells, trenches, irrigation)
- Ground Surface
  - Provided the treatment does not include regulated substances (e.g., uranium, arsenic, VOCs, etc.)
– WHAT DO YOU REGISTER –

SURFACE & SUBSURFACE DISPOSAL OF NONDOMESTIC WASTEWATER

– Drinking Water Treatment Wastewater
  • backwash / system purge / equip. wastewater / sludge dewatering / etc.

  • Storm Water Drainage Wells (Subsurface)
  • Geothermal Wells
  • Groundwater Recharge Fields
  • Non-Domestic Wastewater
Nondomestic Wastewater

• What you **Cannot** Register
  – Gray water or black water
  – Floor Drain discharge from any location where regulated contaminants are used or stored
    • maintenance area, chemical warehouse, machine shop, etc.
  – Contaminated Water
    • (e.g. Car Wash / dry cleaners/ process water, etc.)
Nondomestic Wastewater Considerations

- Site Conditions
- Raw Water Quality
  - Iron and Manganese
  - Minerals, Metals, pH, Arsenic, Uranium)
- Waste Stream Volume
  - Flow Rate / Time Period
- Treatment for Removal
  - Ion Exchange, Greensand, Chemical Precipitation, RO,
- Water Treatment Discharges
  - Brine/ Solids /
Hardness Softening

- **Ion Exchange** is the most common, low cost, low maintenance treatment option.
  - Systems regenerated with **BRINE** typically discharged on-site (dry-well, infiltration ditch or septic system).
  - Approximately 405 sites in NH use brine » C / NC/ PWS.
- Brine may create a new cation exchange process through the soil, as water moves through the aquifer.
Ion Exchange for Iron or Manganese

• Is *inefficient* -- creates more brine waste.
  – due to the low levels of Fe\(^{2+}\) and Mn\(^{2+}\) compared to Ca\(^{2+}\) and Mg\(^{2+}\)

• Larger water systems use “greensand”
  – Oxidative media as their first choice for Fe\(^{2+}\) or Mn\(^{2+}\)

  – IRON alone requires only air + filtration.

  – MANGANESE requires a strong oxidant such as chlorine or permanganate plus greensand.
“Greensand”

PROS
- No brine discharge
- Effective Fe and Mn removals
- Commercially available from residential to large system size
- Many media options dependent on available backwash flow.

CONS
- MANGANESE requires pre-ox chlorine or permanganate
- Chemical handling maintenance and safety
- Pink water complaints
Water Treatment Discharges Registration Conditions:

- Infiltrates on site
- Does not cause erosion or runoff.
- Does not discharge to a surface water or wetland.
- Water treatment system wastewater ONLY.
- Must not render groundwater undrinkable on any adjacent properties.

--Located to minimize influence on the source water supply well, septic systems, and any adjacent drinking water well.
For information on the disposal of Nondomestic Wastewater In NH

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