Reed Bed Sludge Removal

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Chad T. Olsen, P.E. BCEE
**Reed Bed Systems in Wisconsin**

- Stephensville WWTF
- Marion WWTF
- Bear Creek WWTF
- Brillion WWTF
- Sherwood WWTF
- Kewaunee WWTF
- Ephraim WWTF
- Egg Harbor WWTF
- Wittenberg WWTF
- Danbury (Joint Water Quality Commission)
- Bayfield (Greater Bayfield WWTP Commission)
- Washburn WWTF
- Crandon WWTF
- Lomira WWTF
- Belgium WWTF
- Abbotsford WWTF
- Arcadia WWTF
- Red Cliff (EPA)
- Oneida (EPA)
Construction of the Reed Beds

- Typically Reed Beds are constructed with concrete side walls
- PVC liner is used to make the beds impermeable
- Perforated underdrain system usually connected to the head of the plant
- Less than two feet of gravel and sand
- 4 feet of freeboard ±
- Biosolids distribution system
Typical Reed Bed Construction
Sherwood WWTF
**Root System Phragmites (Common Reed)**

- Non-Native Reed – Invasive Species
- Prolific Growers
- Can spread through nodes/rhizomes and seeds
- Requires caution when removing plants/sludge from beds
Root Stalks
Fully Grown
Evacuation of Reed Beds

- Eventually biosolids will accumulate to a depth of 3 to 3 1/2 feet
- Bed are taken out of service for six months, usually in the fall
- This allows time for the biosolids to dry and degrade
- Sludge and reeds removed and landfilled
- Beds emptied late summer/fall. Provide enough time to start to regrow before frost.
**Sludge Removal**

- Only small-tracked equipment can be used in beds to prevent damage to liner or rutting.
- 5 inches of sludge to remain to protect existing root structure.
  - Frequent hand measurements.
- Removed reeds should be placed in bottom of truck and covered with sludge.
- Removed sludge placed directly in trucks and hauled to landfill.
- Beds must be finish graded – level to within 1 inch across bed.
Weather An Important Consideration

- Beds should not be emptied during rain events or when beds are excessively wet
  - Impacts tipping fee at landfill
  - Liquid out of gate when hauling
  - Track mud/sludge off-site

- Beds should not be emptied when very windy
  - Sludge or Reed Bed stalks blowing in wind

- If excessively dusty – may need to add water
Best Management Practices (BMP)

- Follow BMP for Preventing Spread of Invasive Species in Wetlands
- Wear disposable shoe covers of footwear
- Inspect clothing before leaving site
- Inspect trucks – broom off before leaving for landfill
- Cover loads
- Power wash equipment on-site at completion of project
Checking Sludge Depth
Finished Bed