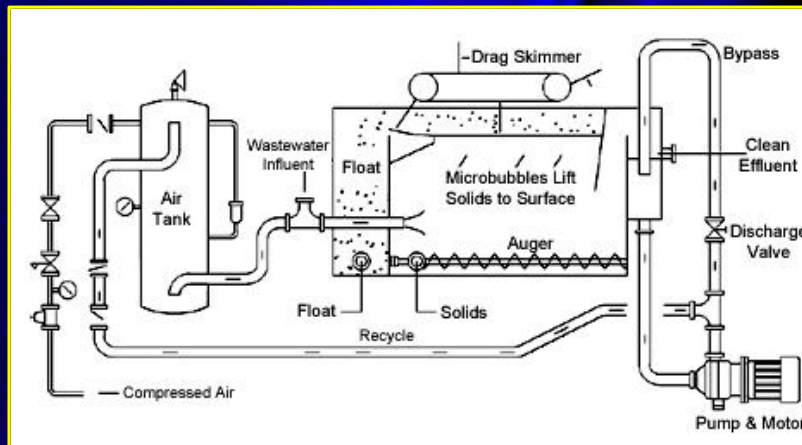
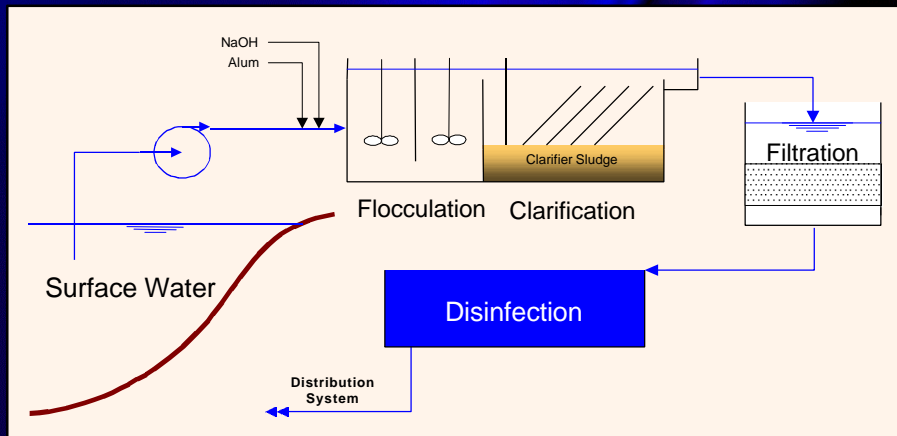


Dissolved Air Flotation



Source: Pan America Environmental Corp. (<http://www.panenv.com>)

Process Overview of Conventional Treatment



Removal Options for Iron & Manganese

- Chemical Oxidation
- Greensand
- Biological Oxidation
- Aeration
- Sequester with Polyphosphates

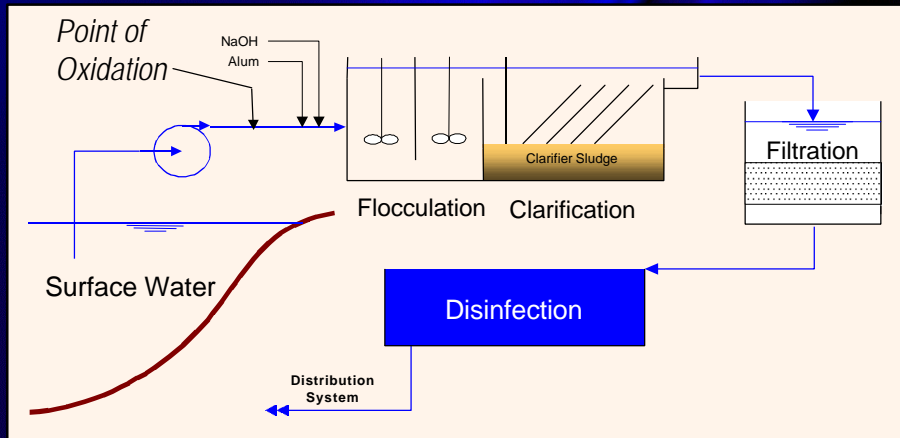
Chemical Oxidation of Iron and Manganese

- Chemical oxidant is added to water



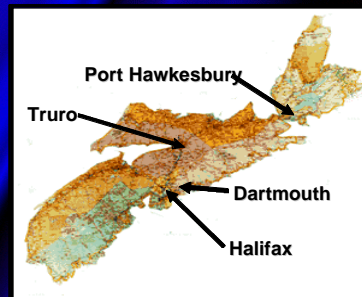
- Oxidized forms are “solids”, which can be removed through coagulation, sedimentation, and filtration

Process Overview of Conventional Treatment



Comparison Among Filtration Plants

- Objective was to compare particle removal among plants
 - Similar raw water quality
 - Different process selection upstream of filtration



Treatment Train for Halifax

- Raw water: Pockwock Lake
- Treatment train:
 - Pre-oxidation for iron and manganese
 - Coagulation with alum and CO₂
 - Flocculation with hydraulic mixers
 - Dual-media filtration (anthracite/sand)
 - Lime addition
 - Chlorination

Treatment Train for Dartmouth

- Raw water: Lake Major
- Treatment train:
 - Pre-oxidation for iron and manganese
 - Coagulation with alum
 - Up-flow clarification
 - Dual-media filtration (anthracite/sand)
 - Chlorination
 - Polyphosphate addition

Treatment Train for Truro

- Raw water: Leper Brook
- Treatment train:
 - Pre-oxidation for iron and manganese
 - Coagulation with alum
 - Flocculation
 - Sedimentation with lamella plates
 - Mixed-media filtration (anthracite/sand/garnet)
 - Chlorination

Treatment Train for Port Hawkesbury

- Raw water: Landrie Lake
- Treatment train:
 - Coagulation with alum
 - Dissolved Air Flotation
 - Dual-media filtration (anthracite/sand)
 - Chlorination