

## Membrane Autopsy Services

### Full Membrane Performance Testing

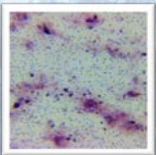
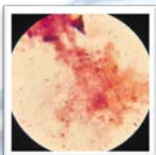
- Test for flux, rejection, differential pressure
- Integrity testing for mechanical leaks

### External & Internal Inspection

- Membrane is examined for physical damage or bypass contamination
- Internal components of the element are examined for damage and fouling

### Foulant Analysis

- **Organic Content Testing** – Loss on ignition testing to determine organic and inorganic percentages of the unknown foulant
- **Microbiological Analysis** – Tests for the presence of microbiological organisms (e.g. bacteria, fungi, bio-slime) using Gram staining methods
- **Attenuated Total Reflectance Infrared (ATR-IR) Spectroscopy** – Spectroscopic method used to help identify types of elemental bonds present in the sample using infrared radiation
- **Scanning Electron Microscopy (SEM) Imaging** – Shows a high-resolution, monochromatic image of the foulant material and membrane surfaces
- **Energy Dispersive X-Ray Spectroscopy (EDS)** – Spectroscopic method that determines the elemental composition of the unknown sample by atomic percentage using X-Ray radiation
- **Element Mapping** – Utilizes SEM and EDS techniques by assigning colors to elements present in a sample. Shows exact location of elements present in the unknown sample. Intensity of color reflects concentration of the element in a given area



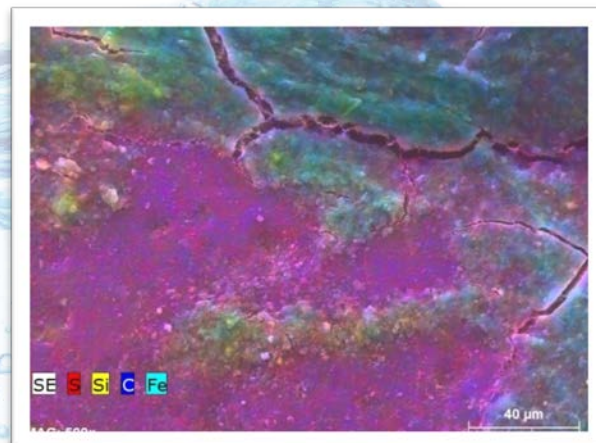
Internal Membrane Inspection

### Cleaning Study

- Harvested membrane flat sheet is cleaned in a cell test apparatus to determine the most effective cleaning regimen specific to the type of fouling being experienced on-site

### Testing for Membrane Flat Sheet Damage

- **Fujiwara Testing** – A qualitative chemical test that tests for the presence of oxidizing halogenated compounds
- **Dye Test** – Uses high molecular weight dye to determine causes of loss of rejection in a membrane (e.g. chemical vs. physical damage)



Element Mapping

**Aqua Clear Water Treatment Specialists**

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