ADVANCED MOBILE FILTRATION SERVICES LLC

WATER TREATMENT CAPABILITIES

PREPARED FOR: WV Mine Drainage Task Force Symposium

April 17,2025

WHO WE ARE

Advanced Mobile Filtration Services LLC (AMFS) is an industrial water filtration company providing one of the most innovative and effective water treatment solutions in commercial use today. With the use of chemical-free, permanent membrane mobile technology, we are a high-volume alternative to traditional filtration in the coal ash and energy space, among others. This technology meets or exceeds permitted allowances for discharge and is rapidly deployable as a mobile technology in addition to the ability to scale for more permanent needs.

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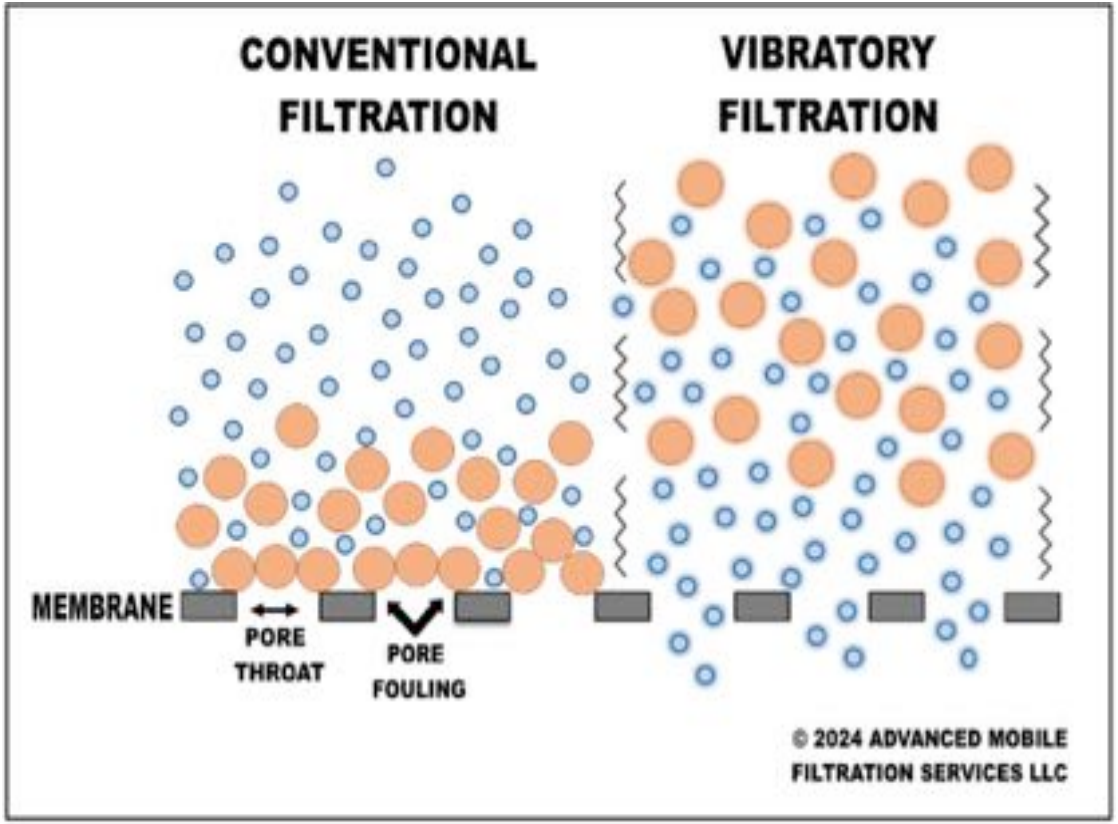
EQUIPMENT INTRODUCTION

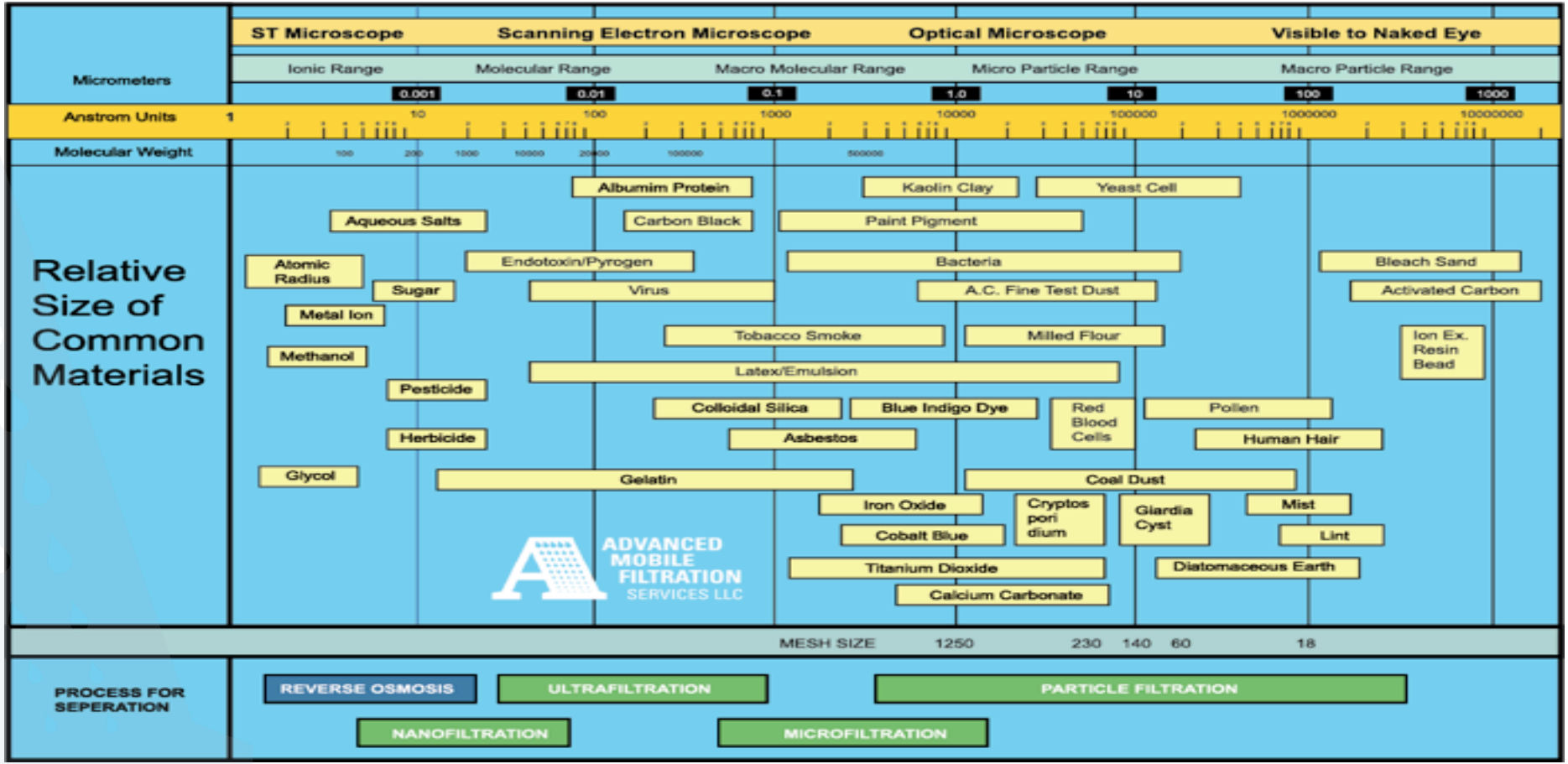
- Each filtration tower has ~ 1,500 square feet of membrane surface area (scalable) and weighs 1.5 tons.
- Membranes have a very high resistance to fouling from to oil, grease and polymers
- Easily removes suspended solids, producing permeate with turbidity <5 NTU
- (99% plus) bacteria and virus reduction without chemicals
- Ability to treat fluid with +50% solids with daily treatment volumes up to 175k gpd
- Capable of removing COC down to 30 Daltons

TECHNICAL COMPARISON

- Conventional – Pretreatment/prefiltration is required to increase the efficiency, life expectancy and RO compatibility.
  AMFS - +50% v/v solids loading acceptable without prefiltration using vibration.
- Conventional – membranes can last between hours to years
  AMFS – membranes operating sill after 30+ years
- Conventional – large footprint of equipment for treatment
  AMFS – 1/5th size of conventional
- Conventional – pretreatment requires polishing of permeate after treatment
  AMFS – no chemicals, no polishing
- Conventional – requires 3rd party support for crane and setup support
  AMFS– completely mobile with onboard crane

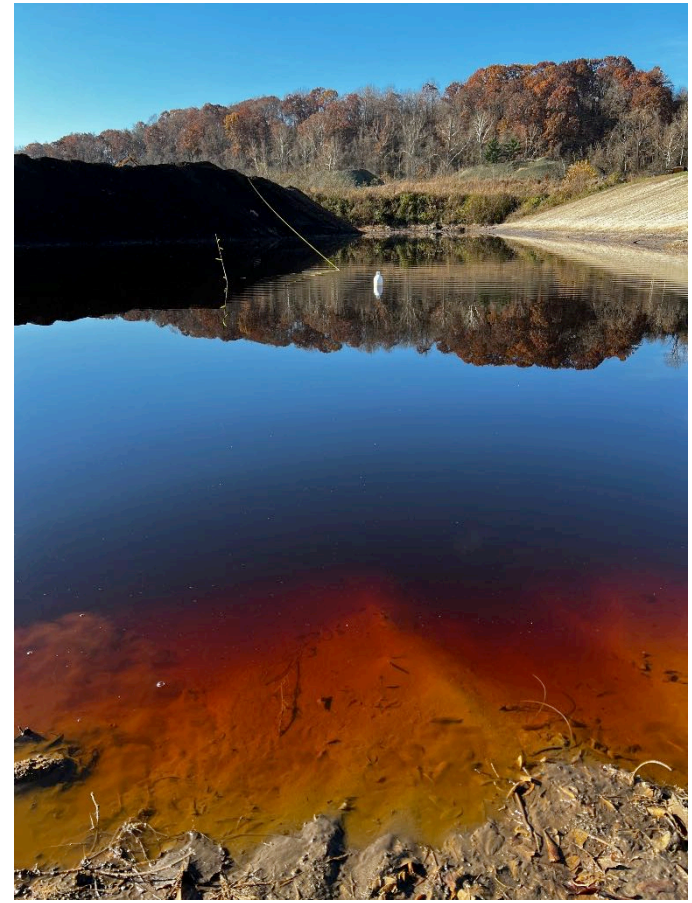


CAPTURE THE WHOLE SPECTRUM



OPERATIONAL SETUP

- Equipment was set up next to the leachate pond
- External pump moved leachate water to a frac tank and internal unit pumps directed the feed to the membranes
- Approximately 109,000 gpd (75gpm) feed
- 24-hour operations over 48 days to completion



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ANALYTICAL RESULTS

Parameter	Units	MDL	Feed	Permeate
Aluminum	mg/l	1.5	0.866	0.01
Antimony	mg/l	0.02	0.0147	<0.0002
Arsenic	mg/l	0.14	7.18	0.0183
Barium	mg/l	14	0.137	0.0527
Cadmium	mg/l	0.0006	0.00368	<0.00006
Cobalt	mg/l	0.0048	0.0211	0.00006
Copper	mg/l	0.048	0.0274	0.00137
Hex. Chromium	mg/l	0.047	0.50	<0.006
Iron	mg/l	2.2	0.462	0.01
Lead	mg/l	0.052	<0.0200	<0.0002
Manganese	mg/l	13.4	0.713	0.0372
Nickel	mg/l	1	0.0369	<0.0009
Selenium	mg/l	0.074	2.13	0.0105
Thallium	mg/l	0.0025	0.0133	<0.00025
Trivalent Chromium	mg/l	1.7	Not Analyzed	<0.00298
Vanadium	mg/l	1.6	1.01	0.00561
Zinc	mg/l	0.42	0.139	0.0167

- Rare Earth Elements entrained in the feed were removed along with problematics such as Aluminum, Iron, Lead, Arsenic, Hexavalent Chromium, and Vanadium, among others, >99% removal efficiency.
- Since chemicals are not added, these recovered elements can be recovered as byproducts.
- Permeate met NPDES Permit and discharged direct to river source.

PHYSICAL CHARACTERISTICS

- Two Phase Separation – Feed : Permeate: Concentrate 100:75:25
- No chemicals are used in the system for filtration, so no increase in COD
- Feed: 30-40,000 uS/cm
  Permeate: 1,200 uS/cm
- Drastic change in NTU
- Concentrate was disposed of offsite

OPERATIONAL CHALLENGES

- Power on Demand - Electrical hookup requiring 480 VAC (volts alternating current) 3 Phase are not always readily available. A generator was placed on location for continuous power.
- Project Installation Location - While hard pack locations were available, the on-board leveling system and secondary containment was deployed on location.
- Feed Characteristics – Changes in contaminants, viscosities and solids loading fluctuated greatly. Constant fluids management aided in a successful project outcome.

PROJECT & TECHNOLOGY SUMMARY

- Remove COC such as PFAS, arsenic and selenium and others from contaminated sources
- Can treat high solids fluid sources without issue (30%)
- Meet National, State and Local permitted targets (NPDES)
- Large volume, low pressure, chemical-free, mobile or fixed based systems. (75 gpm/200 psi)
- Leachate ponds, orphaned tanks/ pits, aquifers, chemical spills and emergency situations

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PAST EXPERIENCE: SPACE FORCE

- Awarded DoD contract for dewatering and treatment of PFAS contaminated fluid
- Removed 100,000 gallons of heavily contaminated AFFF fluid from an underground storage tank (UST)
- Reduced PFOS/PFOA levels from 240,000 ppt to non-detect, exceeding 2024 EPA Drinking Water Regulations
- Permeate was approved to discharge directly into onsite sanitary sewer system

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CLIENT REFERENCE

“An industrial facility in West Virginia had a difficult wastewater that needed treatment for discharge. We researched many treatment options. The AMFS advanced mobile filtration unit was the only system that offered a viable option to meet the low concentrations needed to discharge the water. The AMFS unit performed better than our expectations and successfully treated this difficult water.”

Our Clients

TVA

Stantec

Dominion Energy

Felman Production, LLC

NorthStar

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CONTAMINANT REMOVAL CAPABILITIES

Acid Mine Drainage
AFFF PFOS PFAS
Algae Dewatering

Arsenic

Beet Juice Clarification
Bilge Water
Biogas Effluent
Black Liquor
Boiler Feed Water
Boron
Bottled Water
Box Plant Effluent
Bromide
BTEX
Calcium
Calcium Carbonate
Catalyst Recovery
Calcium Sulfate
Catalytic Converter Coating
Cheese Whey Effluent
Chemical Processing
Chlorinated Solvent
Chromium 6
Coal Ash Ponds
Coal Mine Runoff
Coal Seam Gas Wastewater
Cobalt
Colloidal Silica Concentration
Concentration Carbon Black
Concentration Catalyst
Concentration Titanium
Coolant Recovery
Cooling Pond Water
Cooling Tower Blowdown
DEA Recovery
Deicing Fluids
Desalter Effluent
Diafiltration
Dioxide Wash Water Zeolite
Disposal Well Injection Water
Distillery Effluent (Vinasse)
Drilling Fluid Recycling
Drinking Water
Ethanol Stillage
Flue Gas Scrubber Effluent
Frac Water
Fuel Storage Tank Water
Grease
Groundwater Remediation
Groundwater/Well Water
Gypsum
Hardboard Squeezings
Heavy Coker Gas Oil
Herbicide/Pesticide
Iron
Ion Exchange Regen Water
Iron Oxide Concentration

Lead

Lithium

Manganese
Manufacturing
Manure
Medium Density Fiberboard
Metal Hydroxide Filtration
Metal Plating Wastewater
Mercury
Mining
Molybdenum
Motor Pool Oil
Nickel Mine Sulfate Removal
Nitrogen
Olive Oil Filtration
Olive Processing Wastewater
Orange Juice Clarification
Palm Oil Mill Effluent (POME)
PCB
Paper Coating Recycling
Petroleum and Biofuels

PFAS

Phosphoric Acid Purification
Pigment Concentration
Polymer Diafiltration
Produced Water
PTFE Wastewater
Pulp and Paper

Rare Earth Elements

Refinery End of Pipe Removal
Rendering Wastewater
River Water Purification
RO Reject

Selenium

Slaughterhouse Wastewater
Slop Oil
Sodium Sulfate Concentration
Starch Wastewater
Stripped Sour Water
Sugar Water Clarification
Tailings Pond Water
Tannery Effluent
Tea Concentration
Textile Dye Wastewater
Titanium Dioxide
Ultrapure Water
Washing
Waste Oil Recycling
Wastewater
Wastewater Metals
Wastewater Selenium
Water, Food, and Beverage Beer
Viruses

1,4 Dioxane

Yeast Manufacturing
And more...

amfsfiltration.com

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