SEQUESTRO

We envision a future with contamination-free water for all

Technical Capabilities

Sequestro, Inc.

Est: July 2024
Sector: Clean Tech

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URL: https://sequestro.co
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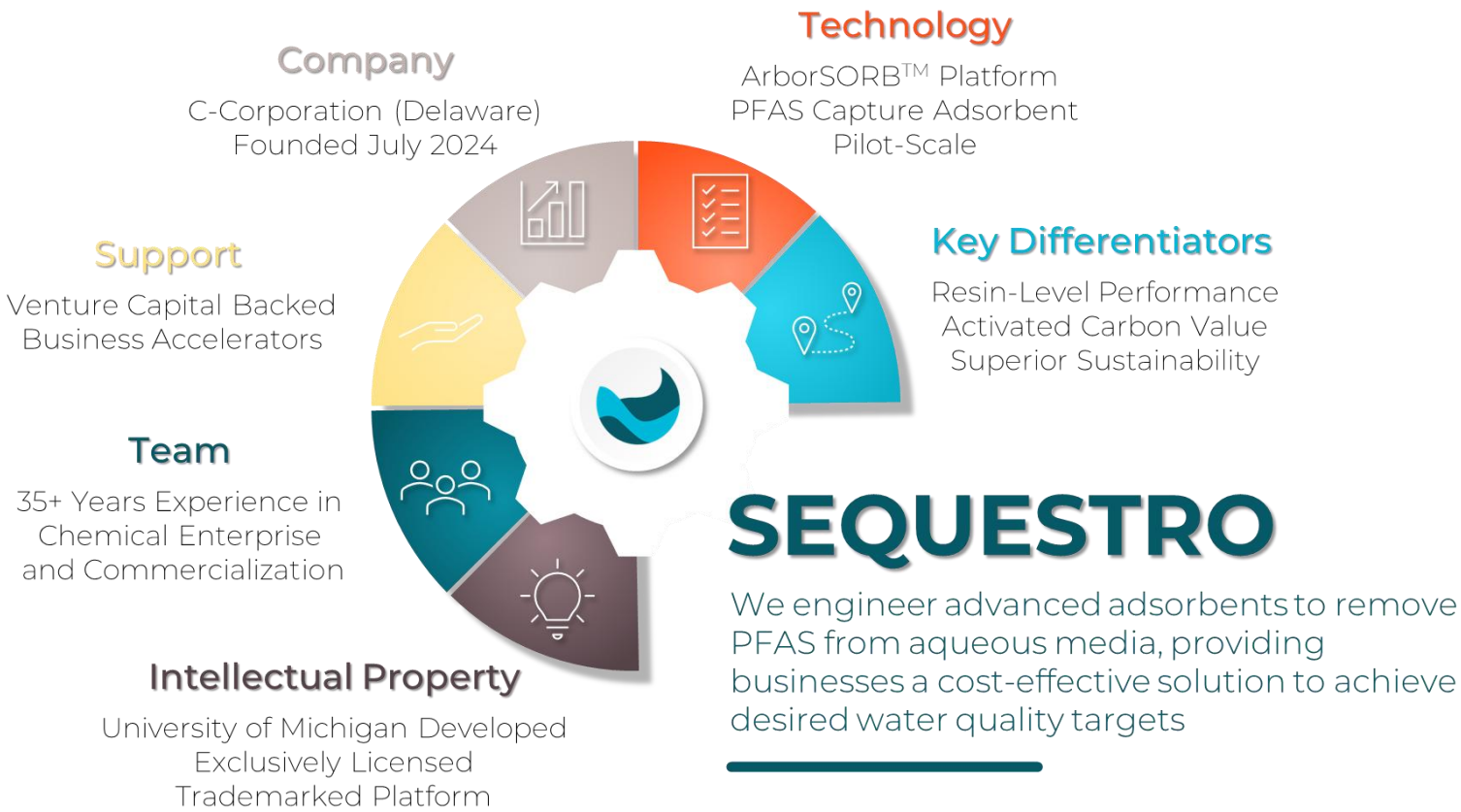
1. COMPANY OVERVIEW

Sequestro, Inc. is an advanced materials startup focused on the development and scale-up of sustainable, high-performance adsorbent technologies for the removal of per- and polyfluoroalkyl substances (PFAS) from contaminated water systems. The company's flagship technology, ArborSORB™, is a proprietary wood-derived, quaternized cellulose adsorbent engineered to provide ion-exchange-resin-level PFAS capture performance while leveraging renewable biomass feedstocks and scalable manufacturing pathways.

Sequestro combines applied materials science, process chemistry, pilot-scale manufacturing, and analytical partnerships to accelerate commercialization of next-generation remediation technologies for municipal, industrial, consumer, and Department of Defense (DoD) applications.

The company operates from MI-HQ in Ann Arbor, Michigan, where it maintains pilot-scale synthesis capabilities, analytical development infrastructure, and access to shared laboratory resources that support rapid technology maturation and field deployment readiness.



2. CORE TECHNICAL CAPABILITIES

PFAS Adsorbent Development

- Design and synthesis of functionalized biomass-derived adsorbent materials
- Quaternization chemistry for permanent cationic surface functionalization
- Development of granular fixed-bed compatible adsorbent media
- Rapid PFAS adsorption performance evaluation
- Short-chain and long-chain PFAS capture optimization
- Resin-equivalent adsorption pathway development
- Sustainable feedstock integration utilizing forestry and wood residual streams

ArborSORB™

Process Chemistry & Scale-Up

- Bench-to-pilot process translation
- Jacketed reactor process development
- Heat and mass transfer optimization
- Reaction exotherm characterization and control
- Pilot-scale mixing and agitation optimization
- Suspension and slurry handling development
- Solid-liquid separation and filtration process optimization
- Manufacturing process mapping and scale-up readiness

Applied Water Treatment Engineering

- Fixed-bed adsorption process evaluation
- Empty bed contact time (EBCT) optimization
- Pilot system integration support
- Treatment train compatibility assessment
- Sampling and deployment preparation
- Media handling and regeneration pathway assessment

Analytical & Characterization Support

- PFAS analytical coordination and interpretation
- LC/MS/MS analytical support through university partnerships
- Moisture content analysis
- pH and conductivity monitoring
- Batch performance testing
- Material quality control workflows
- Adsorbent process reproducibility evaluation

3. LABORATORY INFRASTRUCTURE

MI-HQ Facility – Ann Arbor, Michigan

Sequestro operates from MI-HQ, a multi-tenant advanced laboratory and technology development facility located in Ann Arbor, Michigan. The facility provides flexible wet-lab infrastructure and operational support suitable for advanced materials synthesis, process development, and pilot-scale manufacturing activities.

Facility Capabilities

- Approximately 690 sq. ft. dedicated pilot and laboratory space
- Wet chemistry laboratory environment
- BSL-2 capable infrastructure
- Shared HVAC and environmental control systems
- Dedicated 6 ft chemical fume hood
- Deionized (DI) water access
- Shared cold storage infrastructure (-20 °C and -80 °C)
- Materials receiving and logistics support, including loading dock and warehousing
- Vendor network and procurement support
- Access to shared startup and advanced manufacturing ecosystem resources

MI-HQ Operational Support

The MI-HQ environment enables rapid prototyping and scale-up activities through shared infrastructure, startup support systems, and proximity to the University of Michigan innovation ecosystem. The facility supports:

- Pilot-scale chemistry operations
- Prototype process development
- Startup manufacturing workflows
- Hazardous material handling support
- Equipment integration and deployment
- Collaborative technical development activities

4. PILOT & PROCESS DEVELOPMENT EQUIPMENT

USALab JR-20 Jacketed Reactor System ("Nova")

Manufacturer: USALab
Model: JR-20 Jacketed Reactor System
Configuration: Jacketed Glass Reactor Platform
Operational Volume: 20 Liters
Temperature Range: -40 °C to 200 °C jacketed heat transfer capability
Vacuum Capability: Full vacuum operation
Mixing System: Variable-speed overhead anchor-style agitation
Distillation Capability: Cooled overhead distillation and reflux condenser system
Reagent Addition Capability: Integrated solid and liquid reagent addition systems with shot tank for controlled additions

Technical Applications

- Biomass suspension processing
- Quaternization chemistry scale-up
- Controlled thermal reaction development
- Exothermic reaction management
- Reaction kinetics optimization
- Pilot-scale synthesis translation
- Heat transfer characterization
- Slurry and heterogeneous reaction processing
- Distillation and solvent recovery operations
- Controlled reagent dosing and addition workflows

Process Scale-Up Learnings

Sequestro has utilized the reactor system to develop operational understanding in:

- Agitator selection and mixing dynamics
- Suspension uniformity and solids handling
- Heating and cooling load requirements
- Reaction exotherm management
- Controlled reagent addition workflows
- Material transfer logistics
- Filtration integration strategies
- Pilot-scale reproducibility
- Solvent handling and distillation workflows
- Thermal process safety and operational control

The system serves as a process-development analog for future commercial manufacturing platforms and enables generation of operational data relevant to contract manufacturing and industrial scale translation.

20 L Filtration Platform

Sequestro maintains pilot-scale filtration infrastructure to support solid-liquid separation and adsorbent recovery operations.

Applications:

- Biomass isolation and purification
- Post-functionalization washing
- Solid-liquid separation optimization
- Material recovery workflows
- Process reproducibility validation
- Pilot production support

5. LABORATORY EQUIPMENT

Ohaus AX223NE Analytical Balance

- High-precision gravimetric measurements
- Materials formulation support
- Process yield tracking
- Laboratory-scale quality control
- Reagent preparation and calibration workflows

Ohaus MB90 Moisture Analyzer

- Moisture content determination
- Drying process optimization
- Material consistency evaluation
- Production quality assurance support

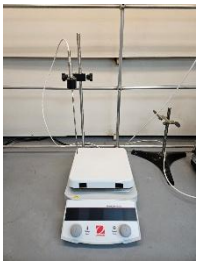
Thermo Fisher Laboratory Oven

Maximum Operating Temperature: ~250 °C

Applications:

- Material drying
- Thermal processing
- Post-synthesis conditioning
- Controlled thermal treatment workflows

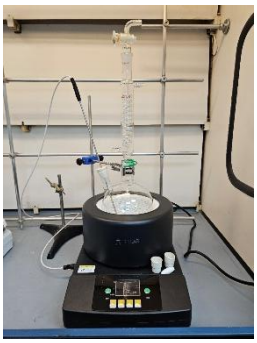
Guardian 5000 Hotplate/Stirrer



Applications:

- Bench-scale reaction development
- Suspension preparation
- Small-volume process optimization
- Solution preparation workflows

USA Lab 2L HeatPro™ Digital Heating Mantle



Applications:

- Controlled thermal processing
- Bench-scale reaction optimization
- Small-volume synthesis workflows
- Elevated-temperature chemistry development
- Mixing and suspension preparation
- Process parameter optimization prior to pilot translation
- Reaction kinetics and thermal behavior evaluation

IKA T25 Digital Homogenizer

Applications:

- Biomass dispersion processing
- Suspension homogenization
- Particle distribution optimization
- Feedstock preparation workflows

Orion / PSTAR 2155 pH & Conductivity Meter

Applications:

- Process monitoring
- Reaction endpoint evaluation
- Water chemistry assessment
- Batch reproducibility tracking

Laboratory Refrigeration Infrastructure

Applications:

- Temperature-sensitive reagent storage
- Standards preservation
- Analytical sample management
- Process chemistry support

6. PROCESS TECHNOLOGY DEVELOPMENT

Sequestro has established an integrated pilot manufacturing workflow for ArborSORB™ production and has expert process technology development expertise.

Mass Transfer Optimization

Development of mixing and agitation methodologies to ensure uniform functionalization and reproducible surface chemistry across biomass feedstocks.

Heat Transfer Characterization

Evaluation of jacketed reactor heating and cooling performance to support efficient and safe process operation.

Exothermic & Endothermic Process Control

Identification and characterization of thermal events associated with scale-up chemistry to support safe operation and future manufacturing translation.

Material Handling & Logistics

Development of scalable workflows for introducing, transferring, isolating, and packaging solid-phase adsorbent materials.

Filtration & Separation Systems

Optimization of purification and washing processes to support high-quality media production.

Manufacturing Translation

Generation of process data required to support future contract manufacturing partnerships and commercial-scale reactor configuration.

7. EXTERNAL PARTNERSHIPS

PFAS Analytical Support

Sequestro maintains analytical partnerships supporting high-sensitivity PFAS characterization and method development.

University of Michigan Analytical Access

Through collaborative relationships within the University of Michigan ecosystem, Sequestro has access to advanced LC/MS/MS analytical infrastructure supporting:

- PFAS quantification
- Adsorption performance testing
- Water matrix evaluation
- Process development studies
- Pilot validation support

External Laboratory Partnerships

The company also coordinates with certified third-party laboratories for independent PFAS testing and validation activities, including support for:

- DoD-relevant water matrices
- Regulatory reporting
- Pilot deployment validation
- RSSCT evaluation
- Performance benchmarking

8. PILOT READINESS & DEPLOYMENT SUPPORT

Sequestro's infrastructure supports transition from laboratory development into customer sampling and pilot demonstration activities.

Current Operational Capabilities

- Kilogram-scale ArborSORB™ production
- Customer sample generation
- Pilot media preparation
- RSSCT support activities
- Process reproducibility validation
- Deployment logistics preparation
- Prototype treatment integration support

Target Applications

- Municipal water treatment
- Industrial PFAS remediation
- Department of Defense remediation sites
- Point-of-entry and point-of-use systems
- Groundwater treatment systems
- Industrial wastewater polishing

9. STRATEGIC ADVANTAGES

Sustainable Feedstock Integration

ArborSORB™ leverages renewable forestry and wood residual feedstocks, supporting circular-economy approaches to advanced materials manufacturing.

Pilot-to-Production Focus

Sequestro's technical infrastructure is specifically designed to bridge laboratory innovation and scalable manufacturing deployment.

Rapid Technical Iteration

Integrated pilot infrastructure allows rapid optimization of chemistry, processing conditions, and manufacturing workflows.

Ecosystem Connectivity

The company benefits from strong integration with the Michigan startup, advanced manufacturing, and university innovation ecosystem.

10. COMPANY DATA

CAGE Code:	0QFV3
NAICS Code:	541715 (Research and Development in the Physical, Engineering, and Life Sciences) – Primary; 325998 (All Other Miscellaneous Chemical Product and Preparation Manufacturing)
Location:	Ann Arbor, Michigan