

CAPILLARY ACTION SEPARATION TECHNOLOGY

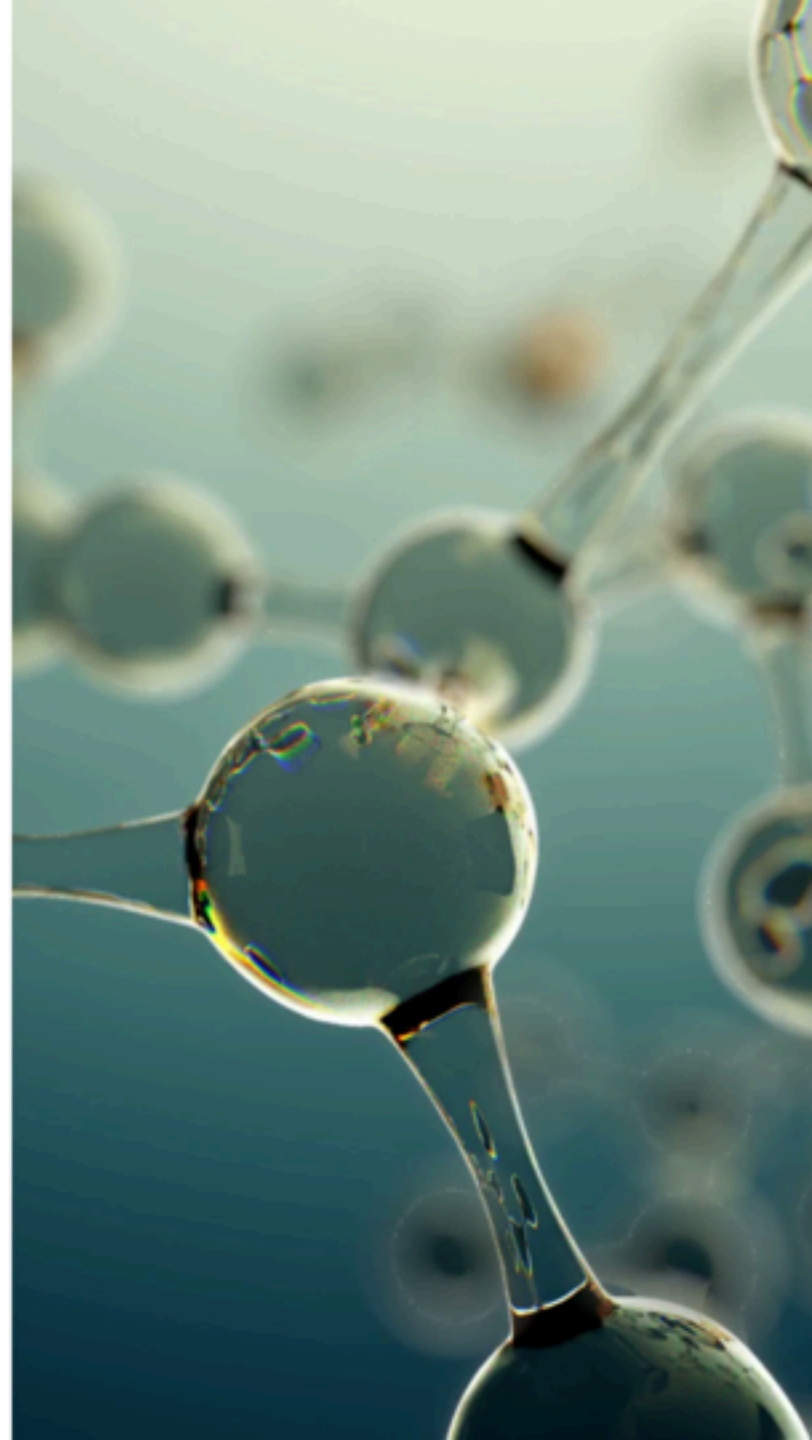
Physically Different.



January 26th, 2024

Region 7 EPA

presented by:





Physically Different

This revolutionary new waste stream treatment technology uses physics rather than chemicals or membranes to **alter the chemical structure of the waste stream**. As the waste stream flows through the **Capillary Action Separation Technology (CAST)**, it produces a beneficial reaction enhancing the release of long-chain contaminants.



Our Story

Handling both hazardous and nonhazardous waste is a significant concern for numerous enterprises. Practically every medium to large scale industry inevitably produces hazardous waste – from the medical sector's pharmaceutical waste, to heavy metals materials and cyanide waste, and chemical industry's acids. Hence, the demand for efficient hazardous waste management and disposal is key in risk minimization for both lives and the environment.

In line with this, strict governmental regulations and standards are set, with non-compliance having serious repercussions. Despite the existence of multiple methods for hazardous waste recycling and reduction, treatment or storage of residual waste is inevitable. Four primary methods encompass hazardous waste: treatment, surface storage, landfill storage, and deep-well injection. Flotation's unique CAST is entirely focused on treatment. From its conception, Flotation has dedicated its resources towards the innovation of unique treatment techniques for waste water and hazardous waste streams.

What Makes CAST Different?



Capillary Action Separation Technology

Powered by:



Novel Stage Design

The initial stage of the CAST system when used for aqueous waste streams stands out because it requires no moving internal parts. This configuration reduces system downtime and makes its operation highly efficient.

Physics-Based Mechanism

Unlike its counterparts, CAST doesn't rely on chemistry but instead uses the laws of physics, making it distinctive among other waste treatment technologies.

Disrupting the Structure of the Waste Stream

The CAST alters the structure of the waste stream utilizing capillary action, physics, and specially formulated ion exchange resins.

Environmental Benefits

The significant environmental advantages of CAST are its low energy consumption, 99% water recovery and utilization for reuse and reduced transportation needs.



In 2022 **Deloitte** conducted a Market Scan & Opportunity Assessment of **Flotation**.

Independently Reviewed by:

Deloitte.

Overview of Flotation

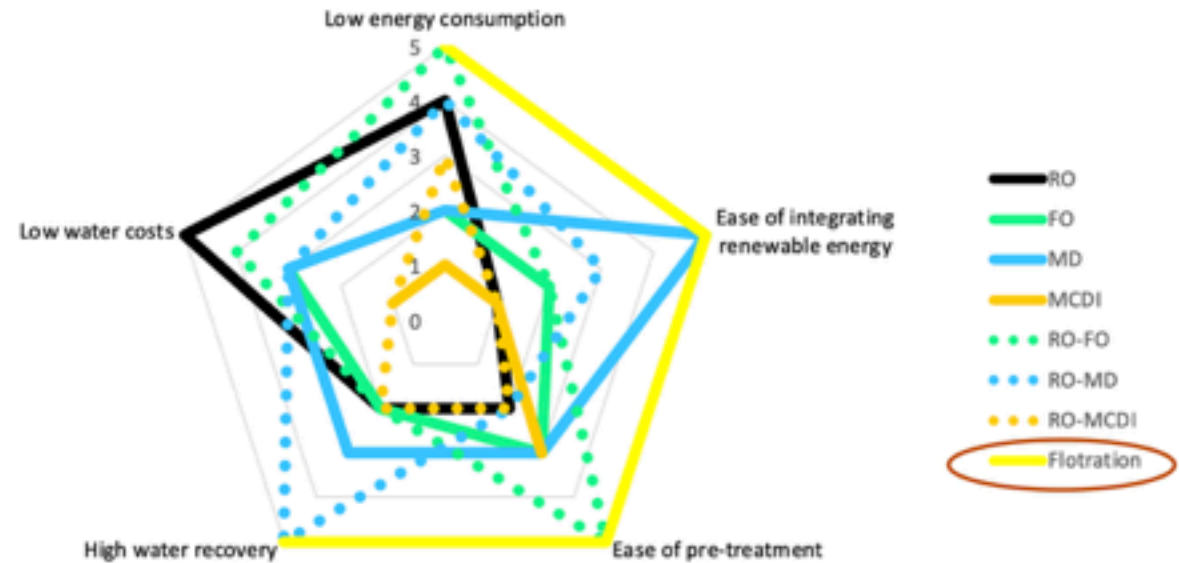
The Flotation process treats the hazardous waste stream by combining fractal geometry with a continuous flow media filtration system. The functioning of the technology depends on physics and not chemicals. Hazardous materials will be removed efficiently by breaking the chemical bonds of elements.

Features

- 99% stream recovery
- High effluent quality
- Low external energy requirement
- Less power
- Rejuvenative media filter
- No expensive membranes
- No Chemicals
- No removal, transportation or disposal of contaminated waste
- Reduced labor costs
- Mobile s/m/ Easy set up

Note: Source links provided in the notes section

Positioning of Flotation among Other Emerging Technologies



- 1) Values towards 5 are most desirable for water treatment
- 2) No indication on cost of Flotation, hence, not included
- 3) Water recovery of MCDI is uncertain, hence, not provided

In November 2023 Flotation treated plume samples from the former Schilling Air Force Base in Salina, KS using their 3rd generation CAST system which demonstrated results which successfully lowered 42 different types of PFAS/PFOS to “non-detect” levels per third-party analysis from **ALS Laboratory Group.**



ALS Group, USA Date: 01-Nov-23

Client: GSI Engineering Work Order: 2310279
Project: GSI Flotation System Lab ID: 2310279-01
Sample ID: Cast System Influent Matrix: GROUNDWATER
Collection Date: 10/24/2023 11:47 AM

Analysis	CUS	Result	Qual	MUL	Report Units	Units	Dilution Factor	Date Analyzed
PFAS BY EPA 527 MODIFIED								
Perfluorobutanoic Acid #1 (PFBA-01)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #2 (PFBA-02)	12	1.7	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #3 (PFBA-03)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #4 (PFBA-04)	12	3.1	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #5 (PFBA-05)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #6 (PFBA-06)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #7 (PFBA-07)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #8 (PFBA-08)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #9 (PFBA-09)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #10 (PFBA-10)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #11 (PFBA-11)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #12 (PFBA-12)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #13 (PFBA-13)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #14 (PFBA-14)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #15 (PFBA-15)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #16 (PFBA-16)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #17 (PFBA-17)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #18 (PFBA-18)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #19 (PFBA-19)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #20 (PFBA-20)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #21 (PFBA-21)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #22 (PFBA-22)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #23 (PFBA-23)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #24 (PFBA-24)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #25 (PFBA-25)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #26 (PFBA-26)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #27 (PFBA-27)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #28 (PFBA-28)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #29 (PFBA-29)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #30 (PFBA-30)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #31 (PFBA-31)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
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Perfluorobutanoic Acid #34 (PFBA-34)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
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Perfluorobutanoic Acid #36 (PFBA-36)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #37 (PFBA-37)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #38 (PFBA-38)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #39 (PFBA-39)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #40 (PFBA-40)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #41 (PFBA-41)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		
Perfluorobutanoic Acid #42 (PFBA-42)	12	0.00	0.1	ng/L	1	10/24/2023 11:26		

- 7 independent tests run by GSI Labs
- Over 140,000 gallons of contaminated plume water treated
- PFAS/PFOS levels of 130+PPT successfully reduced to Non-Detect
- Total Dissolved Solids reduced to 2 PPM
- 140,000 gal permitted to be discharged into Salina City sewer system



ALS Environmental - Report of Lab Analysis

PFAS Contaminated Water
(Before)



Frac Tank #1



01-Nov-2023

Dave Poague
GSI Engineering
539 N Santa Fe
Salina, KS 67401

Re: GSI (Filtration System) Work Order: 23102279

Dear Dave,

ALS Environmental received 2 samples on 25-Oct-2023 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI USA
PHONE: +1 (516) 399-6070 FAX: +1 (516) 399-6185

Sincerely,

Electronic signature file for
Gary Byar
Project Manager

Report of Laboratory Analysis
Certificate No: KS-E-10411
ALS ENVIRONMENTAL, a division of the ALS Laboratory Group, a Campbell/Weather Limited Company

November 1, 2023

CAST Treated Water
(After)



Frac Tank #2

*Flotation's Mobile
Treatment Unit
(MTU)*



FLOTRATION
TECHNOLOGIES™

*Flotation Mobile Treatment Unit
(MTU)*



*Frac Tanks
Untreated & Treated Water*



The Problem



Inefficient Treatment Methods

Reverse Osmosis is the most common treatment method but has a high reject stream & large capital requirements.



Large Carbon Footprint

Significant environmental costs that will impact the health and safety of our children and future generations.

New treatment technology needed to handle growing waste stream volumes in a cost-effective and eco-friendly manner.

Our Solution



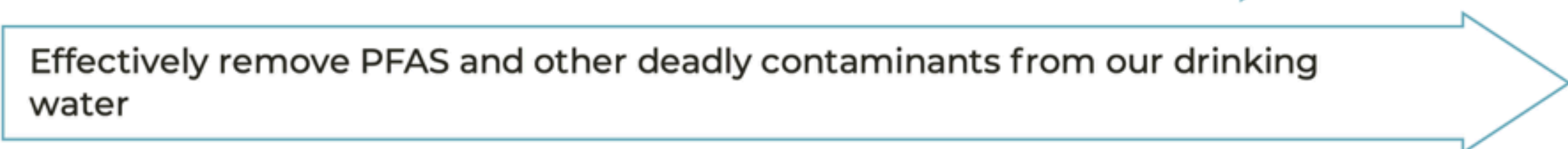
Dramatically Reduced Operational Costs



Significantly Smaller Carbon Footprint

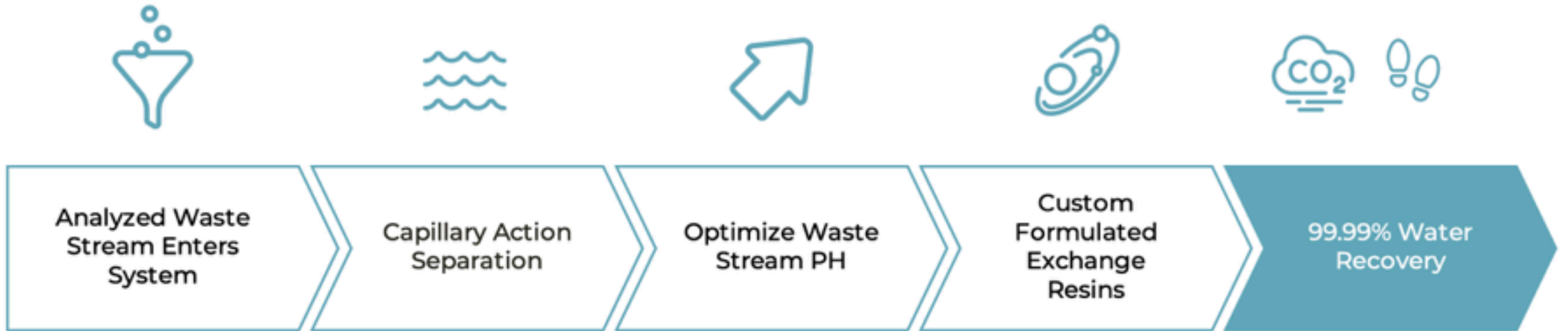


99% Re-Usable Effluent Outflow



Effectively remove PFAS and other deadly contaminants from our drinking water

How it Works



Pilot Results



2015 - 1st Generation Tech - Produced Water Success

Reduced TDS from 130,000 ppm to 9,700 ppm in produced water samples from Johnson County, TX fracking operation.

2021 - 2nd Generation Tech - PFAS Removal Success

Reduced sample plume water PFAS levels from over 124 ppt to near non-detect at former Schilling Air Force Base in Salina, KS.

2023 - 3rd Generation Tech - Schilling Air Force Base PFAS Pilot Testing

Successfully treated 140,000 gallons of plume water directly from the ground source and reduced PFAS/PFOA levels from over 130ppt to non-detect. All 140,000 gallons of treated water was permitted to be discharged into the municipal system.



Brett Johnson
Partner



Rex Vanier
Partner



Jay Vanier
Partner

Meet the Team

Our team is what really makes us tick. We have over 125 years combined experience in hazardous waste, technology development and finance.



Mark Thomas
Partner
Engineering
Advisor



Aaron Kroll
Partner
General Counsel



John Michaels
Business
Development



Ace Wagner
Specialist