Montrose Environmental Group

Augusta Regional Airport

Augusta, GA

* Images from https://localitybiz.com/business/35188276/augusta-regional-airport-aircraft-rescue-fire-fighting-department-augusta

ARFF Transition – ECT2 Experience

OPP-2025-07-14-073398
Submission Date: August 20, 2025

SUBMITTED TO:

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1.0 Project References

ECT2 has extensive experience working with municipal, military, and industrial customers to provide bench scale proof of concept, on-site pilot demonstration of technology, and full-scale treatment systems that have resulted in the treatment of over 10 billion gallons of water for PFAS compounds to date, ECT2 has experience with AFFF cleaning focused on ARFF vehicles. Some examples of that experience are listed below. ECT2 is actively supporting multiple contracts for this service now, so by the time your Augusta vehicles are being cleaned the number of ARFF vehicles cleaned by ECT2 will be over 30.

ECT2 Cleaning Chemistry and Method Development

The 2020 NDAA established firm timelines for the Department of Defense to phase out the procurement and use of PFAS-containing firefighting foams. In response, ECT2 began research efforts to develop effective, yet pragmatic, treatment chemistries and procedures for cleaning residual PFAS compounds out of equipment. ECT2's R&D facility worked with the EPA on developing cost effective and best-in-class cleaning techniques to remove recalcitrant AFFF film from the inside of pipe materials. After testing over 30 blends of cleaning chemistry and optimizing the procedure, ECT2 has developed a more efficient and cost-effective methodology than alternative approaches.

ECT2 evaluated the relative effectiveness of each solution with respect to PFAS mass removal and rebound (amount of PFAS mass that would contaminate the next liquid stored in that section of pipe). Figure 1 shows mass removal and % rebound for one of the soak tests. ECT2 also evaluated other cleaning processes to determine relative effectiveness, then combined those studies to provide a customer-focused approach that is more effective than conventional triple rinse while generating less liquid waste to manage.

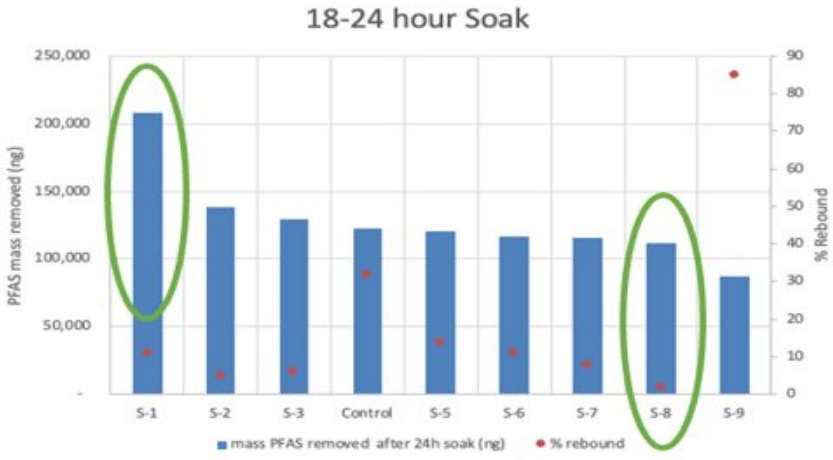

Figure 1 - Chemistries with higher mass removal (blue bars) and lower rebound (red dots) in pipe sections cut from the same AFFF-impacted piping sections were advanced for further cleaning method evaluation.

Our next steps included familiarization with the firefighting vehicles, building proprietary cleaning equipment, and setting up a full-scale demonstration. In South Carolina, ECT2 had an opportunity to clean two of the same type and size ARFF vehicle side by side. One was cleaned with a conventional triple rinse. The other with the new ECT2 methodology and proprietary chemistry. These vehicles did not need to be placed immediately back into service, which enabled rebound testing as well. The results were excellent, and lessons learned were incorporated to enable further improvements. This methodology continues to be optimized and has been implemented on ARFF vehicles in 2024 as shown below.

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ECT2 Full Scale Demonstration

ECT2 cleaned two OshKosh TI-3000 vehicles with 420-gallon foam concentrate tanks in January 2024. Generating 1/3 the waste when compared to triple rinse, ECT2's cleaning method with only a single rinse was statistically equivalent in initial reduction efficiency despite having more than 18x higher starting contamination levels. Additionally, the truck cleaned with the ECT2 cleaning solution included a much larger fraction of sulfonic PFAS compounds which are more difficult to remove from surfaces.

Oshkosh TI-3000 (Truck A – conventional triple rinse)

Oshkosh TI-3000 (Truck B – ECT2 cleaning method)

Figure 2 shows that the 12-day rebound testing on those two foam tanks resulted in 71% removal efficiency for the triple rinse vs. 99.5% removal efficiency for the ECT2 method.

33-day rebound testing further reduced the removal efficiency for the triple rinse to only 50% while the removal efficiency for the ECT2 solution was at 98.3%.

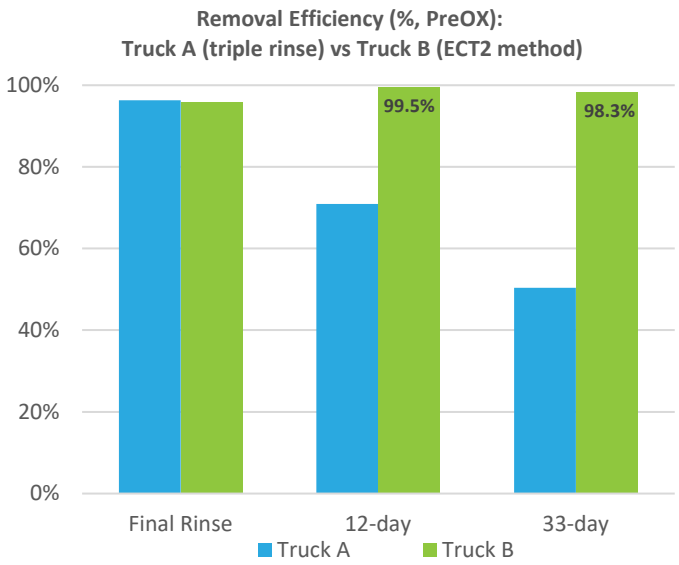

Figure 2 – Removal Efficiency and Rebound

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ECT2 Customer Reference – Naples, FL

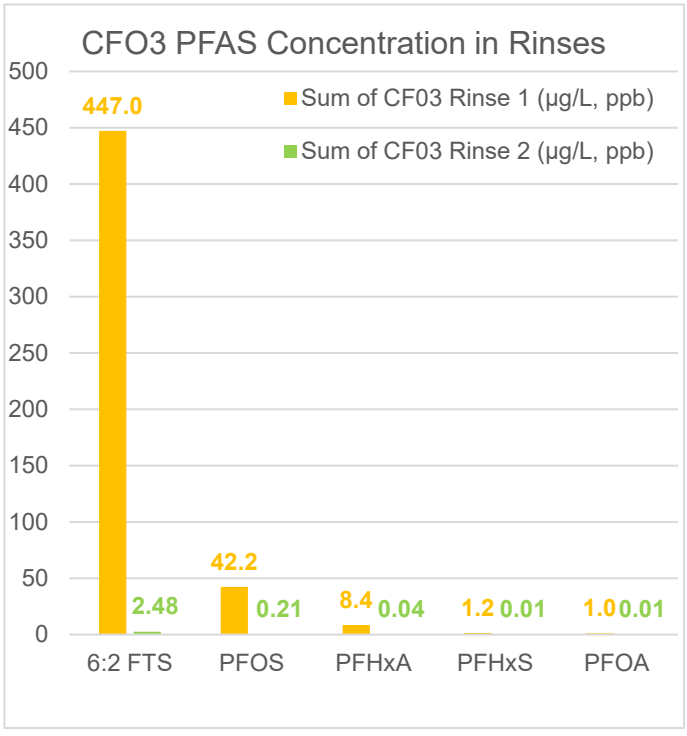
ECT2 cleaned two ARFF vehicles with 210-gallon foam concentrate tanks for the Naples Airport Authority in June 2024. Rinse volumes were increased relative to the South Carolina effort, but still much less than a conventional triple rinse.

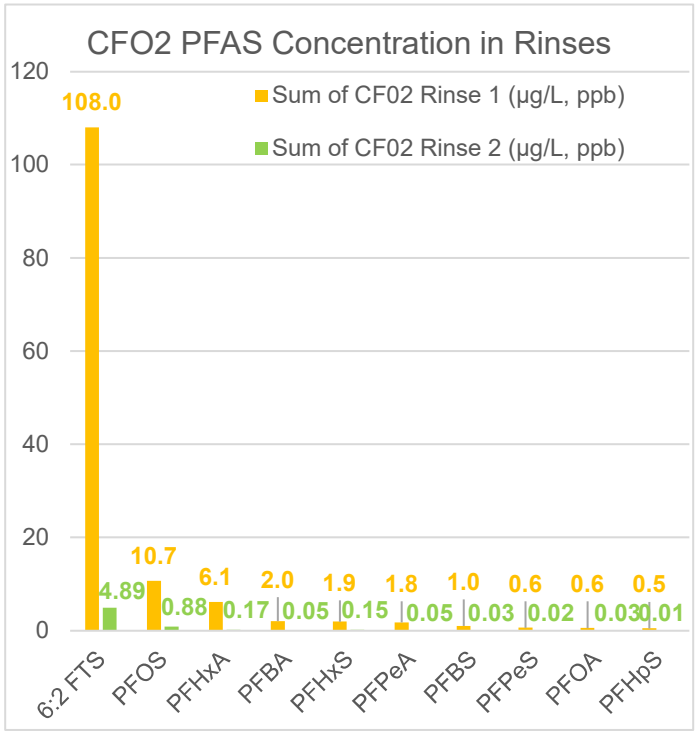
Naples FL CF03 E-One Titan 1500

>99% PFAS Removal Efficiency when comparing initial and final rinse concentrations.

Naples FL CF02 Oshkosh Striker 1500

95% PFAS Removal Efficiency when comparing initial and final rinse concentrations. This vehicle had lower initial levels of contamination than we often see.





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ECT2 Customer Reference – Joint Base Cape Cod, MA

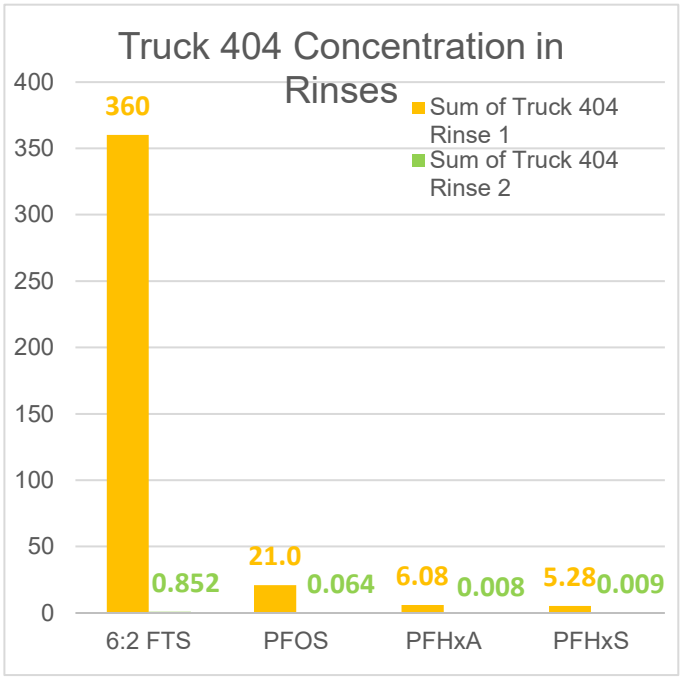
ECT2 cleaned two ARFF vehicles for Joint Base Cape Cod in October 2024. These ARFF vehicles were both Oshkosh Strikers but different size vehicles. The cleaning recipe and methods used at Naples FL were repeated here.

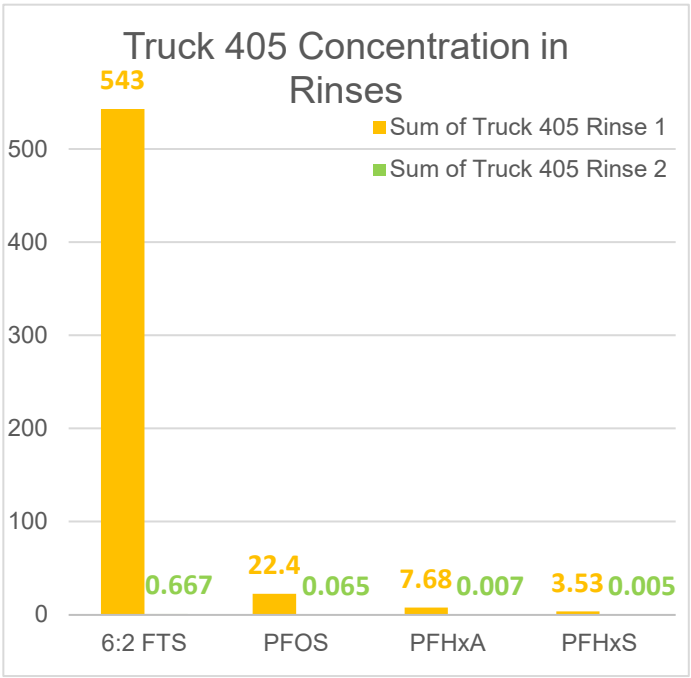
JBCC 404 Oshkosh Striker 1500 (210-gallon foam tank)

>99% PFAS Removal Efficiency when comparing initial and final rinse concentrations.

JBCC 405 Oshkosh Striker 3000 (420-gallon foam tank)

>99% PFAS Removal Efficiency when comparing initial and final rinse concentrations.





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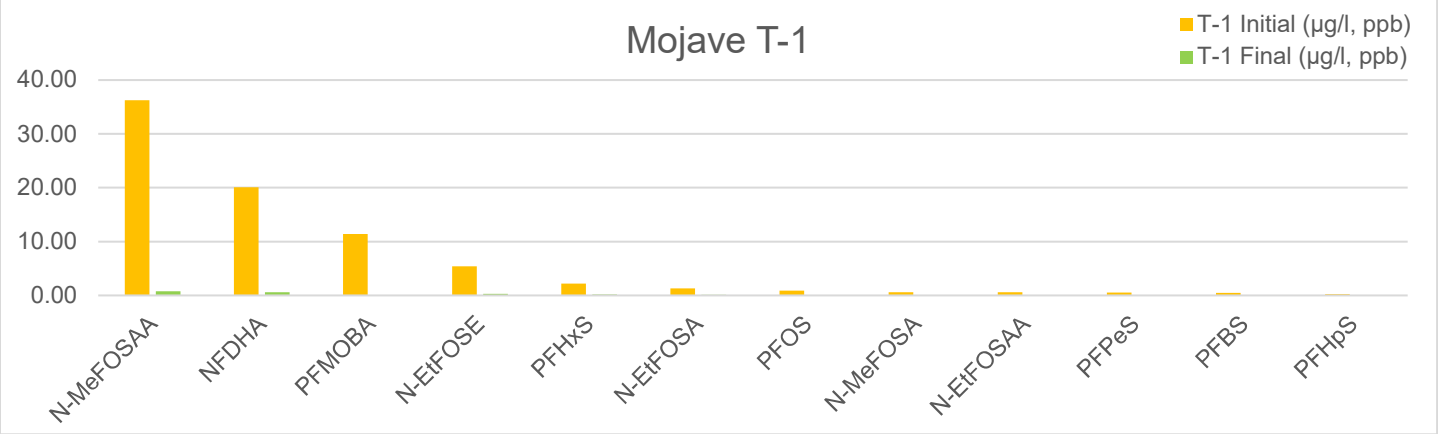
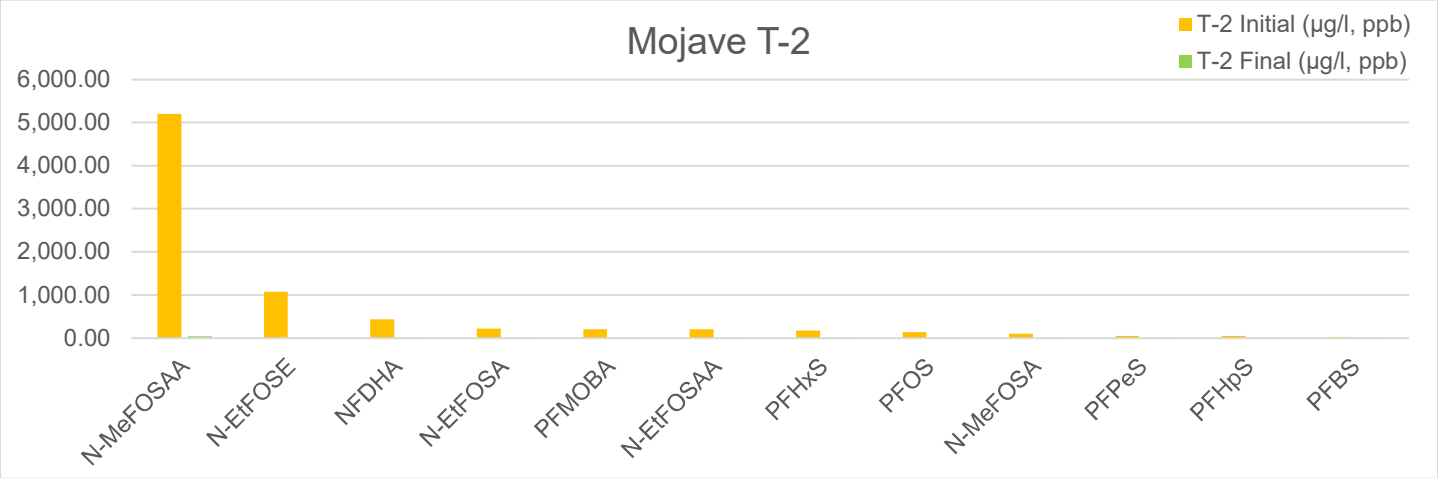
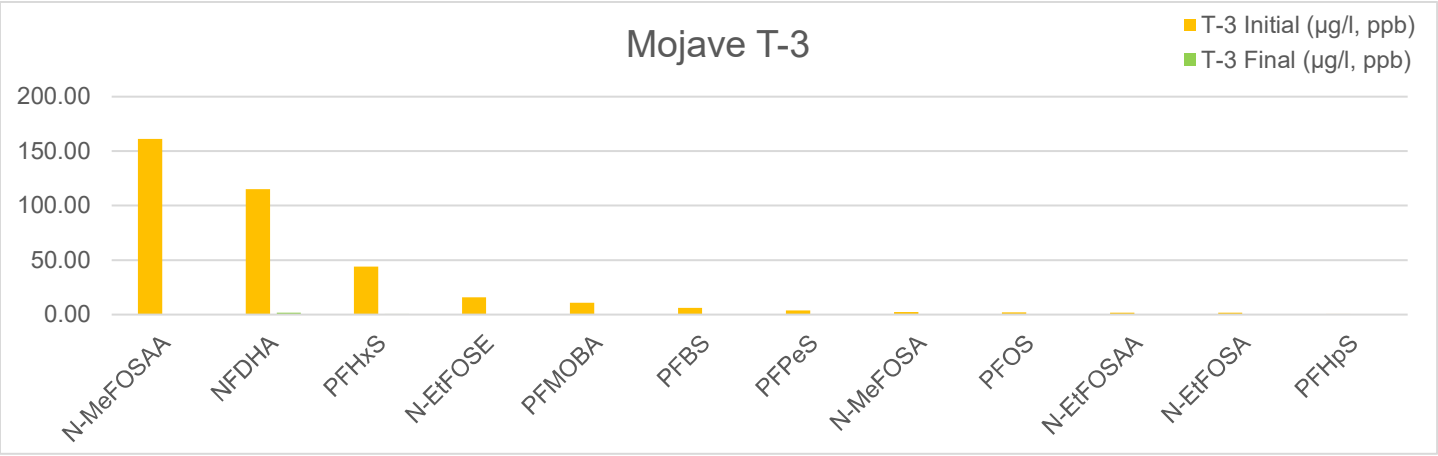
ECT2 Customer Reference – Mojave Air and Space Port, CA

In March of 2025, ECT2 cleaned three ARFF vehicles for the Mojave Airport to prepare the vehicles for the new class of fluorine-free foams. Two of the vehicles were Oshkosh T-3000 units with 420-gallon foam concentrate tanks. One was an Amertek DF4000L with a 200-gallon foam concentrate tank. Cleaning efficiencies of 97%, 99.3%, and 99.2% respectively.







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Reference Contact Information

	Name of Company	Contact Person	Telephone Number
a.	Sarasota Manatee Airport Authority	Felipe Goncalves	941-390-6681
b.	Palm Springs Fire Dept.	Jason Vaccarello	760-861-2417
c.	Mojave Air & Space Port at Rutan Field	Chris Spandorf	661-824-2433

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John Pinkowski

Senior Field Specialist

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Windermere, FL

Cell: +1-407-252-2334

Professional Experience

John is a skilled Senior Field Specialist with over 20 years of dedicated experience in environmental remediation, particularly in the crucial area of PFAS removal systems. His expertise spans both private and government sectors, making him a versatile asset in the industry.

John's project management expertise is exemplified by his successful supervision of the cleaning of 22 Aircraft Rescue and Firefighting (ARFF) vehicles across seven (7) airports. He has also demonstrated exceptional leadership while commissioning a mobile PFAS removal system for the United States Marine Corps (USMC) and managing various environmental remediation projects. As the Interim Site Manager at the Sonoma Renewable Biofuels Plant, he not only ensured a seamless startup operation but also played a key role in training and mentoring new staff, showcasing his ability to nurture talent and foster a collaborative work environment. His involvement in significant projects, including PFAS wastewater removal and lagoon remediation, highlights his technical expertise and leadership capabilities.

John has a comprehensive technical background, which encompasses hydraulics, electrical systems, and heavy equipment operation. His qualifications as a certified biogas plant operator, along with certifications such as OSHA 40-hour HAZWOPER and Forklift Operator, further underscore his commitment to maintaining the highest safety and operational standards.

Relevant Project Experience

PFAS Removal from ARFF Trucks, Multiple Airport Locations, U.S.A.

As Senior Field Specialist, John helps coordinate mobilization, lays out the containment and cleaning equipment, drains AFFF concentrate from firefighting foam systems, makes up batches of proprietary cleaning solution, cleans and rinses tanks and piping, coordinates transportation and disposal of waste materials, and assists with loading new fluorine-free foam concentrate and proportion testing as needed. John has cleaned 22 ARFF vehicles at seven facilities in 2024 and 2025. He is well-versed in the use of proprietary cleaning solutions that have yielded significant efficiency in PFAS removal. Project locations include Naples, Florida; Mojave, California; Memphis, Tennessee; Palm Springs, California; San Luis Obispo, California; Sarasota, Florida; and Tampa, Florida.

USMC, Mobile PFAS Removal System, MCAS New River, NC

John served as the lead operator for setting up and delivering a mobile PFAS removal system, which was specifically designed and built for the USMC. John was also responsible for executing this pilot study.

Remediation Projects, Multiple Site Locations, U.S.A.

John supervised the daily operations of multiple environmental remediation projects and construction sites for both private and government clients. Operated various PFAS removal systems.

Sunoma Renewable Biofuels Plant, AZ

John's role as the Interim Site Manager at the Sunoma plant was pivotal in ensuring a seamless transition during the commissioning and startup phases. John's coordination with the Engineering Design Team was instrumental in swiftly identifying and resolving punch list items and warranty issues, showcasing his attention to detail and problem-solving skills. Moreover, John's leadership of the rotating crew of Site Operations personnel not only fostered a collaborative environment but also ensured that the site startup period was executed efficiently and effectively. John's dedication to building a skilled and reliable team was evident as he actively supported the recruitment and onboarding of full-time staff members, ensuring they received comprehensive training tailored to the project's needs. In addition to his leadership and team-building efforts, John took the initiative to create vital work instructions and round sheets that streamlined operations. His involvement in the review process for the Standard Operating Procedures (SOPs) further underscores his commitment to operational excellence and safety.

Education, Licenses & Certifications

Diploma, Ichabod Crane Central High High, Valatie, NY

USMC, Corporal E-4, Trained as a weapons repairman, MOS 211, Honorable Discharge

Additional Professional Training: OSHA 40-hour HAZWOPER, OSHA 30-Hour, American Biogas Council Digester Operator school, Confined space entry/supervisor, Class 1,2,3,4,5 Forklift Certified Operator

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Eben Joslyn

Project Engineer

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Professional Experience

Eben Joslyn is a Project Engineer with over 25 years of experience in project management and engineering within both public and private sectors. Currently employed at Emerging Compounds Treatment & Technologies (ECT2), he specializes in PFAS treatment technologies for water while managing project schedules, budgets, safety, and quality. Notably, he has led the cleaning of 20 Aircraft Rescue and Firefighting (ARFF) vehicles across multiple airports, preparing them for effective use with fluorine-free foam. Eben is adept at creating detailed project schedules, managing procurement, and analyzing data.

In his role at ECT2, Eben supervises multiple engineering projects, ensures compliance with budgets and timelines, monitors project progress, coordinates procurement, and mentors junior engineers, while maintaining strong client relationships through effective communication. Eben's work has enhanced safety measures and minimized environmental impact in diverse project locations across the U.S.

Eben's previous work includes serving as Project Manager for environmental remediation projects in Weymouth, MA, and as a Field Services Engineer for the Maine Drinking Water Program, where he provided technical support and oversight for water system projects. He holds a B.S. in Environmental Engineering and possesses various safety and environmental management certifications.

Relevant Project Experience

PFAS Removal from ARFF Trucks, Multiple Airport Locations, U.S.

As Project Manager, Eban has successfully overseen the entire mobilization, cleaning operations, and subsequent demobilization process for a series of projects focused on updating ARFF (Aircraft Rescue and Fire Fighting) vehicles. These initiatives are crucial in ensuring that the vehicles are not only clean but also adequately prepared to utilize a new class of environmentally friendly fluorine-free foam. This transition is vital for enhancing safety measures while minimizing the environmental impact associated with traditional firefighting foams.

Eban has managed the meticulous cleaning of 20 ARFF vehicles across six different airports, ensuring that each vehicle meets the stringent standards required for safe operation with the new foam. His attention to detail and organizational skills have been instrumental in executing these projects efficiently while adhering to rigorous timelines. The project locations have been diverse, showcasing a breadth of experience across various regions. These locations include: - Naples, Florida - Mojave, California - Memphis, Tennessee - Palm Springs, California - San Luis Obispo, California - Sarasota, Florida - Tampa, Florida. By effectively coordinating logistics, overseeing crew operations, and ensuring compliance with regulatory requirements, Eban has played a pivotal role in advancing the capabilities of ARFF vehicles in these airports, thereby enhancing overall airport safety and response readiness.

Project Engineer, ECT2, Portland, ME

Overseeing multiple engineering projects concurrently, Eben ensures compliance with timelines and budgets while preparing detailed project schedules, work breakdown structures, and resource allocation plans. Eben regularly monitors progress, allowing for the identification of potential issues and the prompt implementation of corrective actions. Additionally, Eben coordinates procurement activities with vendors for timely material delivery and conducts site visits to address technical challenges and uphold safety regulations.

Eban's role also involves the review of technical documents for accuracy, providing guidance to junior engineers, and effectively managing change orders to assess their impact on project parameters. By fostering strong relationships with clients through clear communication and identifying opportunities for process improvements, Eben supports business development through proposal preparation and cost estimation. Moreover, Eben utilized project management software to track progress and resources, resolve team conflicts, mentor junior staff, manage project budgets, and implement safety protocols to minimize risks during construction. Coordinating with external stakeholders further contributes to the overall success of the projects.

Project Manager, Various Environmental Projects, Weymouth, MA (The Vertex Companies, Inc.)

Eben was responsible for understanding, investigating, and documenting complex environmental projects. He provided risk management strategies, oversight, and technical support on a variety of environmental remediation projects. In addition, Eben managed budgets and schedules of project activities, reviewed scopes of work and cost estimates, and provided timely reporting of project status to the client and other stakeholders. Eben also managed client/project compliance with applicable federal, state, and local regulatory requirements. In addition to his management activities, Eben performed field work, including environmental assessment activities, documenting construction oversight activities, and various inspection services.

Field Services Engineer/DWSRF Project Manager, DHHS/CDC, Drinking Water Program, Portland, ME (The State of Maine)

Eben provided technical and regulatory support to community public water systems to achieve and maintain compliance with the Safe Drinking Water Act. Eben inspected drinking water facilities to ensure the protection of public health. Eben's engineering duties involved reviewing and approving plans and specifications for new or modified drinking water sources and treatment systems serving community public water systems. Management duties for the Drinking Water State Revolving Loan Fund (DWSRF) included reviewing and approving project plans and specifications, overseeing construction, and approving and processing payment requisitions and change orders for drinking water-related construction projects financed through the Fund.

Education, Licenses & Certifications

B.S., Environmental Engineering, Wentworth Institute of Technology, Boston, MA

Additional Professional Training: OSHA 40-Hour HAZWOPER, OSHA 511, Occupational Safety and Health for General Industry Certification, OSHA 10-Hour Construction Safety Certification, High-Pressure Boiler Certification

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Chad Bennett, M.Eng, PE

Applications Engineering Manager

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Professional Experience

Chad has over 20 years of experience with water treatment infrastructure and technologies. For four years, he designed, bid, and inspected the construction of agricultural infrastructure improvements to protect the drinking water supply for the city of Syracuse, NY.

Chad worked at Pall Water Systems for almost 14 years, where he helped pilot and design dozens of membrane systems for municipal drinking water and wastewater treatment, primarily in North America. Those ranged from small community drinking water projects to limit-of-technology nutrient removal from a 75 MGD wastewater discharge. He has also helped pilot and design water reuse projects, including groundwater injection that prevents saltwater intrusion along the coast of California and the first municipal wastewater to drinking water project in the United States, in Big Spring, TX.

Chad has helped develop and deploy mobile water treatment systems that enabled industrial facilities, from infant formula to chemical manufacturing plants, to stay in operation by providing a safe ingredient water supply or accepting the effluent from a failed industrial wastewater plant and treating it to stay within discharge permits.

Chad has been working at ECT2 for over four years using several treatment technologies to support municipal, military, and industrial customers with a variety of water and wastewater treatment applications – primarily dealing with PFAS contamination.

His most recent area of focus is serving as lead product engineer for the transition of existing firefighting apparatus from AFFF to synthetic fluorine-free foams. This work reduces occupational exposure for first responders as well as the communities they serve.

Relevant Project Experience

PFAS Water Treatment Plant Piloting at Chemical Plants in Alabama and Illinois

Process Engineer during piloting for greenfield PFAS water treatment plants at chemical production facilities in Alabama and Illinois. Operated and maintained membrane pilot equipment, provided remote support for field technicians, conducted regeneration of ECT2's SORBIX™ RePURE ion exchange media, sampled for PFAS analysis, reviewed and interpreted process data, and contributed to reports and presentations. These are the largest and most advanced PFAS treatment plants in operation.

PFAS Water Treatment Plant Process Designs at New Mexico DoD Facility

Applications Engineer for a greenfield PFAS water treatment plant at a DoD facility in New Mexico. New treatment plant extracts and treats up to 1,200 gpm of PFAS-contaminated groundwater, utilizing granular activated carbon and ion exchange treatment. Led process design, scope definition, cost estimation, and proposal development during the bid phase and maintained process engineering support through the design phase after award. The success of this effort led to the award of a 2,000 gpm treatment plant on the same base.

Mobile PFAS Treatment System Design at North Carolina DoD Facility

Applications Engineer for the design and sale of a mobile PFAS treatment system that included oxidation, sand filters, granular activated carbon, ECT2's SORBIX™ PURE ion exchange media, and a diesel generator to enable remote deployment. Led process design, scope definition, cost estimation, and proposal development during the bid phase and maintained process engineering support through the design phase after award. Provided ongoing process support as the asset has moved from one successful remediation effort to the next.

Mobile PFAS Treatment System Design at California DoD Facility

Applications Engineer for the rental and operation of a mobile PFAS treatment system that included ECT2's AvPURETM for the treatment and discharge of 200,000 gallons of AFFF-impacted water. Led process design, scope definition, cost estimation, and proposal development during the bid phase and maintained process engineering support during work plan development and execution.

Cleaning AFFF Out Of Firefighting Vehicles For Transition To Fluorine-Free Foams

Product Engineer for ECT2's proprietary cleaning process. Designed custom equipment to enable the work and wrote work instructions. Cleaned vehicles with conventional triple rinse and ECT2 method side by side to develop design, cost, and proposal templates for commercialization. Visited customers, created proposals, and cleaned vehicles at active airports with field staff to train them and gather data for process improvement.

Education, Licenses & Certifications

B.S., Civil Engineering, Clarkson University, Potsdam, NY

M.Eng., Biological and Environmental Engineering, Cornell University, Ithaca, NY

Licensed Professional Engineer, Civil, State of New York, License No. 084884

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Dave Kempisty

Vice President, Technology, PhD, PE

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Professional Experience

Dave is a licensed engineer with over 20 years' experience in the water treatment and environmental remediation space. His current role at ECT2 focuses on the use of novel technologies for the removal of emerging contaminants such as PFAS, 1,4 dioxane and carcinogenic volatile organics from the environment.

Education, Licenses & Certifications

B.S. Environmental Engineering, Michigan Technological University, Michigan, 1996

M.S. Environmental Engineering, USAF Institute of Technology, Ohio, 2006

Ph.D. Civil Engineering, University of Colorado, Boulder, Colorado, 2014

Professional Engineer, State of Michigan, #6201062856

Funded Research & Research/Grant Management Experience

USEPA - DW-057-92441501-0 (Role: PI); Water Treatment w/ Advanced Oxidation (2015-17)

AFIT/EN Faculty Research Council

- Funded #2016-010 (Role: PI). Treatment Approaches for PFAS Impacted DOD Sites (2016)
- Funded #2015-014 (Role: PI). Removal of Perfluorinated Compounds w/ Conventional & Advanced Adsorbents in Batch & Flow-Through Columns (2015)

Contracting Officer's Technical Representative; Oversaw $7M in various efforts for 20+ personnel:

- SERDP/ER-1127: Aerobic Co-Metabolic Systems for the In-Situ Chlorinated Solvents
- ESTCP/ER-199719: Reductive Anaerobic Biological In-Situ Treatment Technology
- ESTCP/ER-199810: Cometabolic Air Sparging to Remediate Chlorinated Solvents
- ESTCP/ER-200005: AFFF Treatment Using Air Sparged Hydrocyclone Technology
- SERDP/WP-1111: Environmentally Advantaged Substitutes for Ethylene Glycol Deicing Operations
- SERDP/Project WP-1110: Genetic Enhancement of an Anti-Freeze Protein for Deicing Operations

**Students noted with an asterisk*

Patents & Selected Publications

Kempisty, D.M., Gordon, C., Haxen, J., Mowla, O., Nickelsen, M.G., Woodard, S.; The treatment of PFAS-impacted groundwater using novel regenerable ion exchange resin: A five-year case study; Australian Water Association Water e-Journal, https://doi.org/10.21139/wej.2024.006. 2024.

Houtz, E.; Kempisty, D.; Lester, Y. PFAS Destruction via Advanced Reduction Processes: Assessing Scientific and Commercial Progress and Prospects. Current Op in Chem Eng, 2024, 44, 101022. 2024.

Kempisty, D.M., Arevalo, E., Spinelli, A., Edeback, V., Dickenson, E., Husted, C, Higgins, C., Summers, R.S., Knappe, D.; Granular activated carbon adsorption of perfluoroalkyl acids from ground and surface water, AWWA Water Science; https://doi.org/10.1002/aws2.1269. 2022.

Kempisty, D., Racz, L. - editors; Forever Chemicals – Environmental, Economic, and Social Equity Concerns with PFAS in the Environment; 342 pgs; ISBN: 978-0-367-45640-5; CRC Press. 2021.

US patent 10,793,454B1 - *Russell, M., Stubbs, J., Kempisty, D. Water Treatment System with Ultraviolet Light Emitting Diodes and Photocatalysts. October 2020.

Kempisty, D.M., Arevalo, E., Reinert, A., Edeback, V., Dickenson, E., Husted, C., Higgins, C., Summers, R.S.,Knappe, D.; Adsorption of Per- and Polyfluoroalkyl Acids from Ground and Surface Water by Granular Activated Carbon contaminants in Groundwater; AWWA Water Quality Technology Conference, Dallas, TX, 2019.

Kempisty, D.M., Summers, R.S., Abulikemu, G., Deshpande, N.V., Rebholtz, J., Roberts, K., Pressman, J.;Granular Activated Carbon Adsorption of Carcinogenic Volatile Organic Compounds at Low Influent Concentrations; AWWA Water Science; https://doi.org/10.1002/aws2.1128. 2019.

Kempisty, D., Xing, Y., Racz, L. - editors; Perfluoroalkyl Substances in the Environment: Theory, Practice, and Innovation; 498 pgs; ISBN: 9781498764186; CRC Press. 2018.

Emery, I., Kempisty, D., *Fain B., Mbonimpa, E.; Evaluation of Treatment Options for Well Water Contaminated with Perfluorinated Alkyl Substances using Life Cycle Assessment; The International Journal of Life Cycle Assessment. 2018.

Emery, I., Kempisty, D., *Fain, B., Mbonimpa, E.; Life Cycle Evaluation of PFAS Remediation Scenarios; Joint International Society of Industrial Ecology and International Symposium on Sustainable Systems and Technology Conference; Chicago, IL. 2017.

Kempisty, D.M., Phillips, R., *Dyson, S., Magnuson, M., Mills, M.; Advanced Oxidation and Adsorption Treatment Train for the Removal of Toxicity from Emerging and Co-contaminants in Groundwater; World Environmental and Water Resources Congress, Sacramento, CA, 2017.

Employment History

Vice President, Technology, Montrose, January 2025-Present

Director, Emerging Contaminants, ECT2, May 2022-December 2024

Senior Business Development Manager, Evoqua Water Technologies, 2019–2021

United States Air Force, Lieutenant – Lieutenant Colonel, Domestic and International, 1997–2019

*Students noted with an asterisk