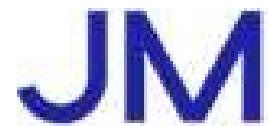


# Development of electrically regenerating DPFi<sup>®</sup> for Underground Mining



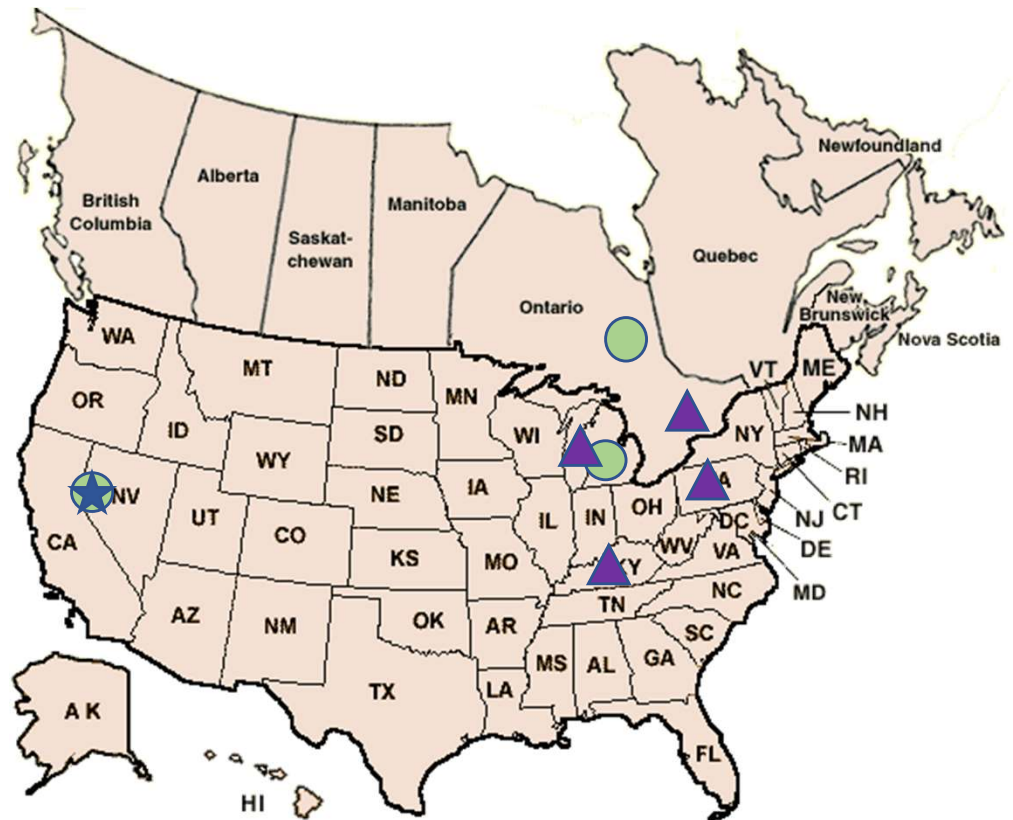
**Johnson Matthey**  
Inspiring science, enhancing life

# About Us:

*MineTerra = Your Emissions Control Specialists*

- ★ Headquarters
- Sales Offices
- ▲ Manufacturing & Warehousing

MineTerra focuses on Diesel  
Emission Solutions  
specifically for  
Underground Mining



# **Problem:** Light-Duty vehicles with low engine exhaust temperatures cannot regenerate DPF

- Many mines are using light-duty vehicles for maintenance, people moving, and other low-duty operations which do not allow for high enough exhaust temperatures to regenerate passive DPFs
- Installing a DPF on low-temperature vehicles drives maintenance costs up due to the frequency with which DPFs need to be swapped and cleaned

# Requirements: DPFi® Solution needed - Long Life & Low Emissions

- An aftertreatment system for equipment which produces high levels of DPM
- An aftertreatment system for machines that do not generate sufficient exhaust gas temperature to facilitate DPM regeneration (e.g. Toyota Land Cruisers, Forklifts & Wheel loaders)
- An aftertreatment system that creates no secondary emissions such as NO<sub>2</sub>
- Easy Maintenance and Long Filter Life
- Ability to monitor Product Performance and record data
- Dependable system performance, simple operation

# DPFi® from Johnson Matthey in EU applications

- The DPFi® was designed for use in tunneling
- Certified by VERT in December 2015
- The DPFi® was installed on various sizes and types of equipment

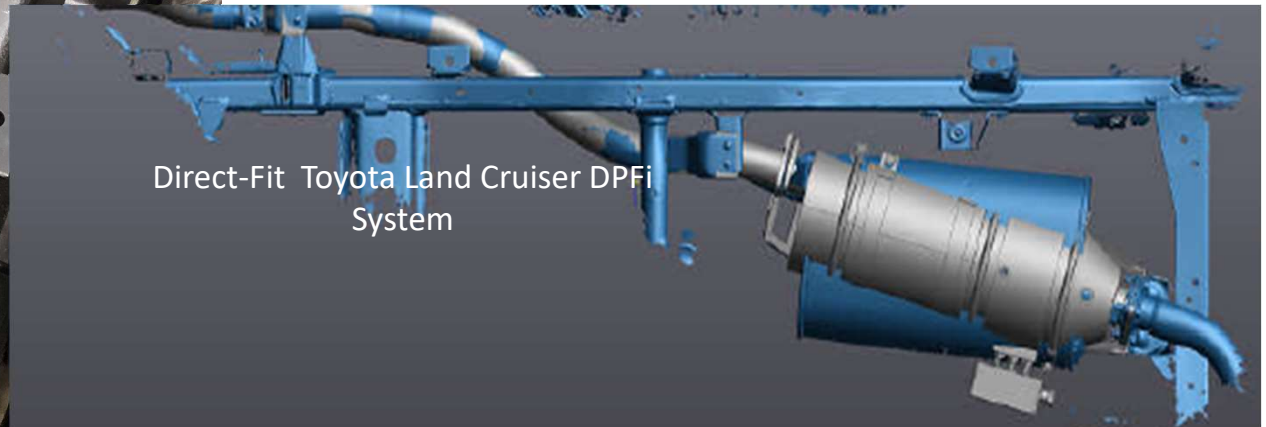




# DPFi® Toyota Land Cruiser



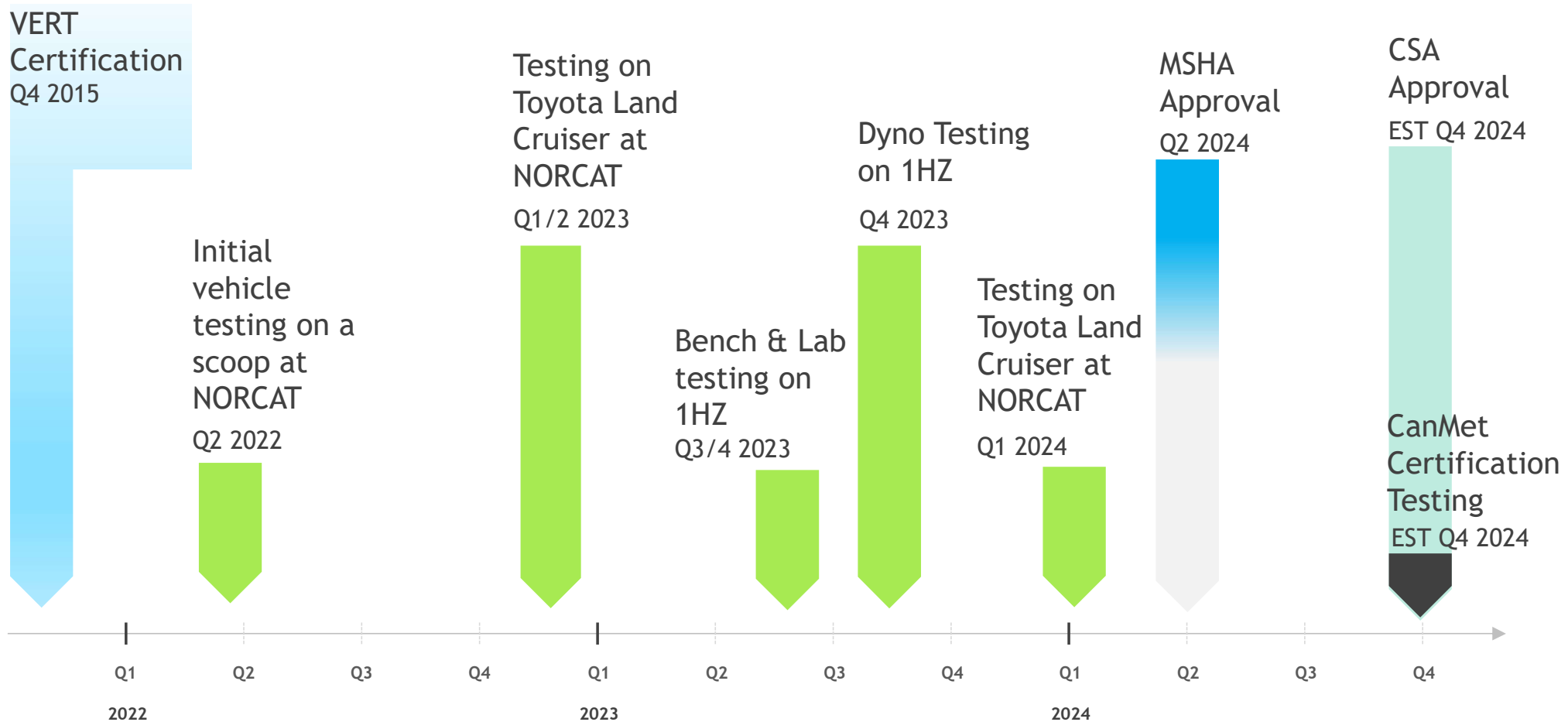
- Direct fit Installation
- Exhaust section direct fit that replaces OEM muffler



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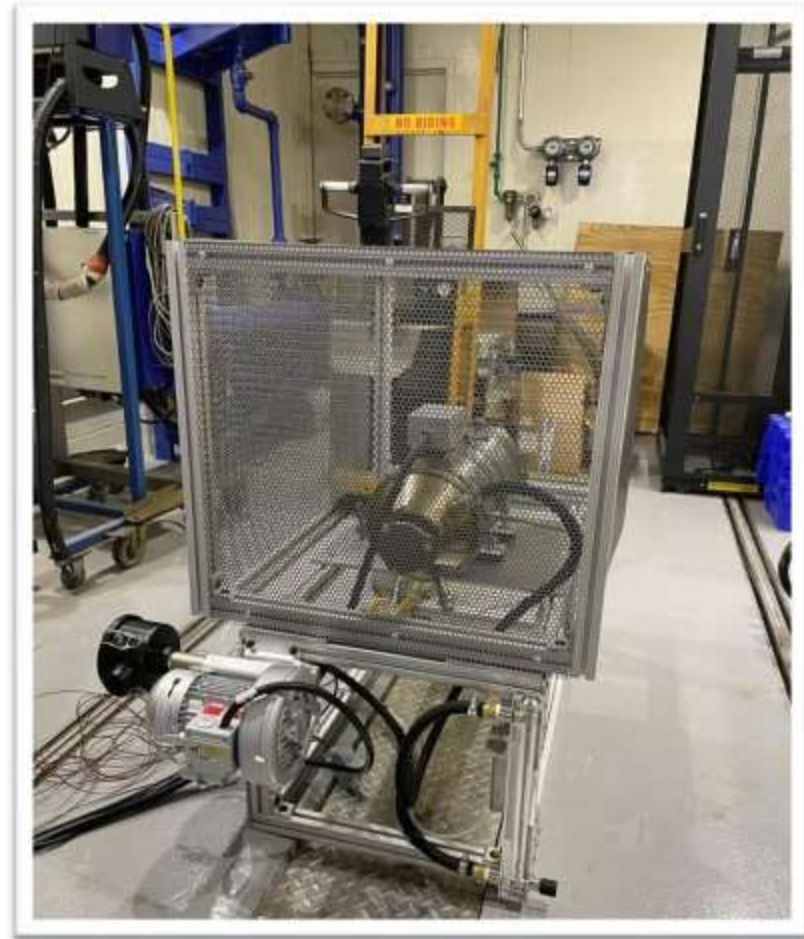
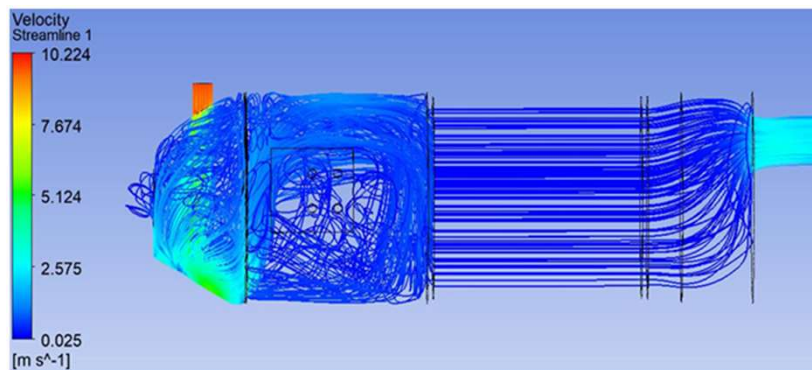
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# Development Timeline



# Bench & Lab Testing

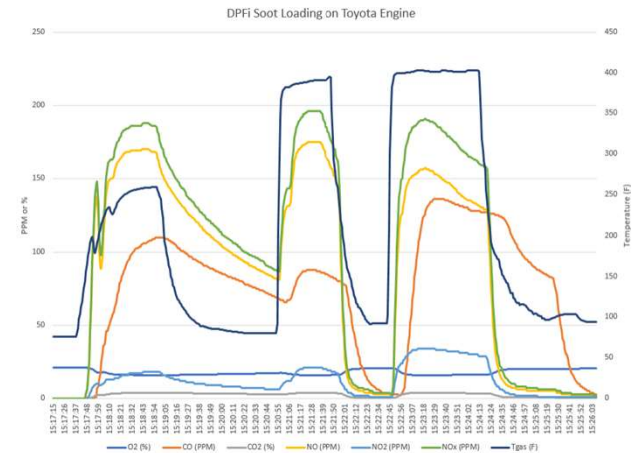
- Update blower and check-valve selection
- Update electrical components in the control box and transducer to meet CSA
- Establish flow criteria for various inlet cone designs



From Devon Bench Test



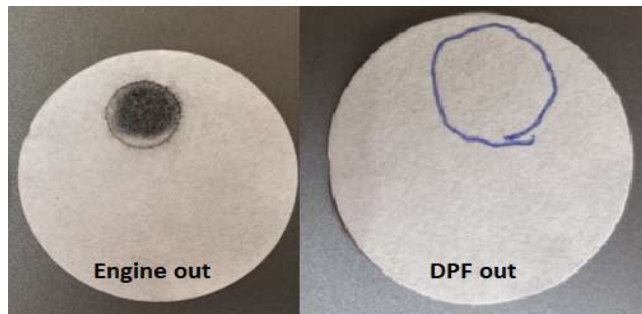
# Dyno Testing at Active Dynamics



Utilized a Toyota 1HZ engine to soot load the DPFi® in a controlled environment.

- Weighed the DPF throughout testing
- Monitored temperatures throughout soot loading and regeneration

# NORCAT Underground Mining Center Testing

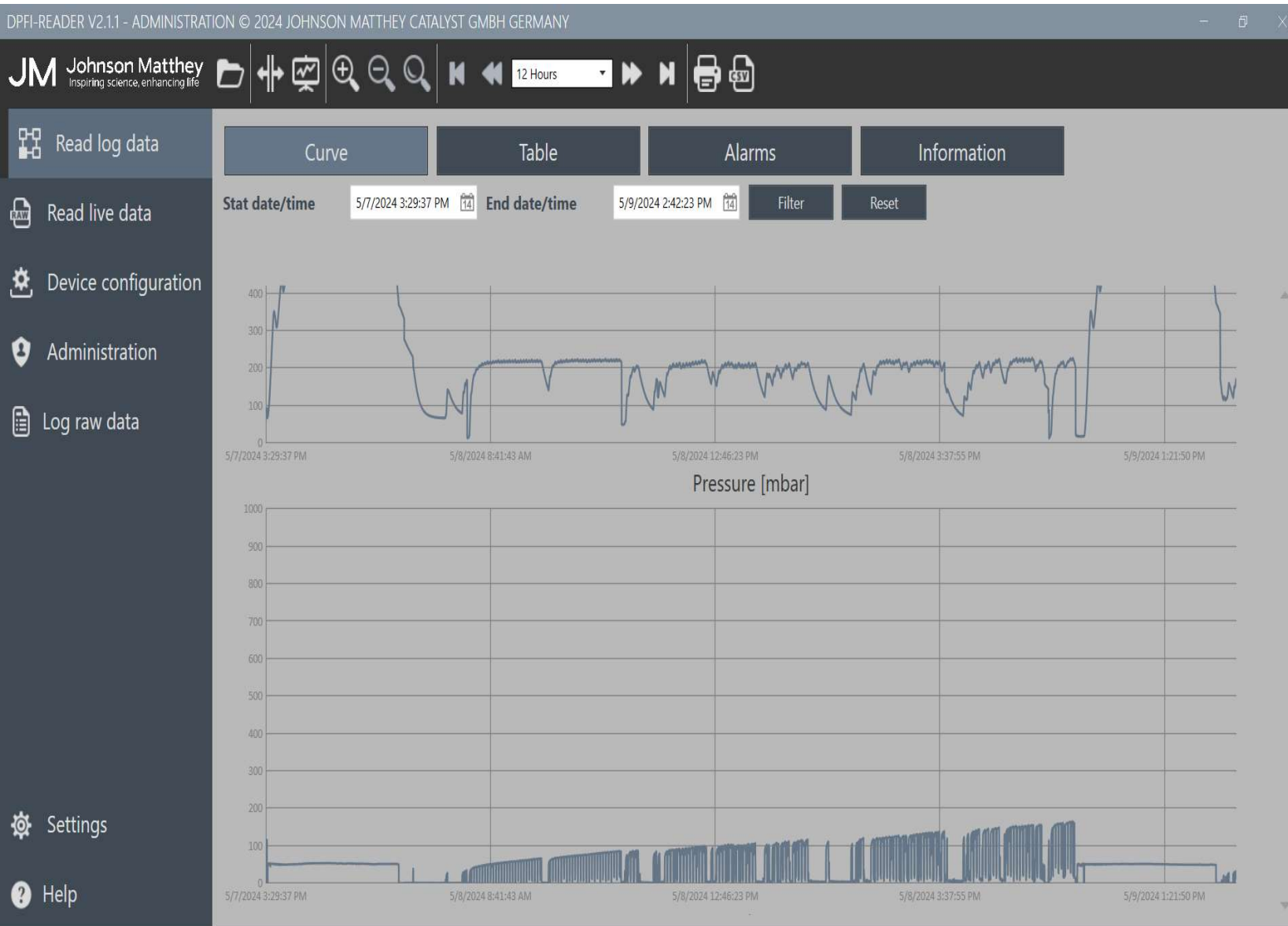


	Engine Out	DPFi® Out	Percent Reduction
Smoke Dot	9	0	90+
CO (PPM)	174.6	83.3	52%
NO2 (PPM)	35.9	11	69%



Testing done on a Toyota Land Cruiser,  
courtesy of Acces Industrial.

# Software Driven Technology



- All Data recorded and stored
- Alarm diagnosing and monitoring
- Read live/ logged data
- Device configuration

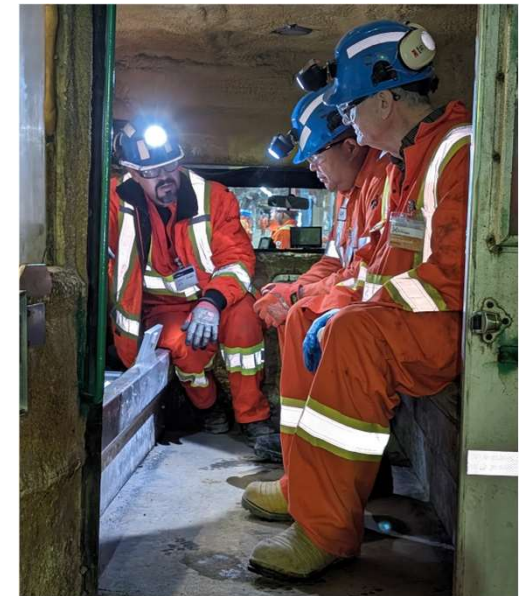
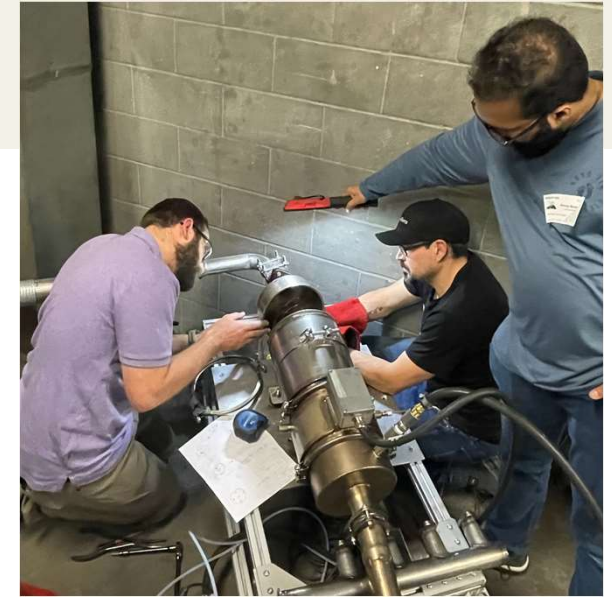
# Certifications & Approvals

- Initial System VERT certification in 2015
- MSHA approval May 2024
- CSA Pre-approval completed July 2024?
- CSA Lab. testing and final certification to be completed November 2024
- CanMet testing scheduled for November 2024
- VERT update to be completed November 2024



# Thank you!

- Pat Lessard
- Joe Stachulak
- Johnson Matthey Team
- Acces Industrial



Proprietary & Confidential



# Thank you!

