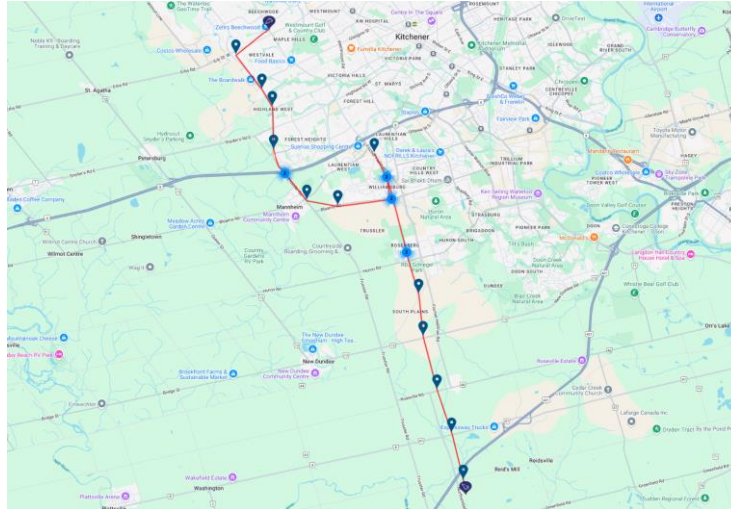


CASE STUDY

PATRIOT AGM DEMONSTRATION ON ENBRIDGE

PIPELINE - KITCHENER, ONTARIO



INTRODUCTION

PigRun Solutions was invited to demonstrate our **Patriot AGM remote tracking technology** during a multi-day pigging operation on a 12-inch Enbridge gas pipeline in Kitchener, Ontario. The pipeline spanned approximately 24 kilometers and involved several cleaning runs over three days. The cleaning program included six pigs of varying types (foam, brush, magnetic) and one gauge plate, as part of a scheduled maintenance operation.

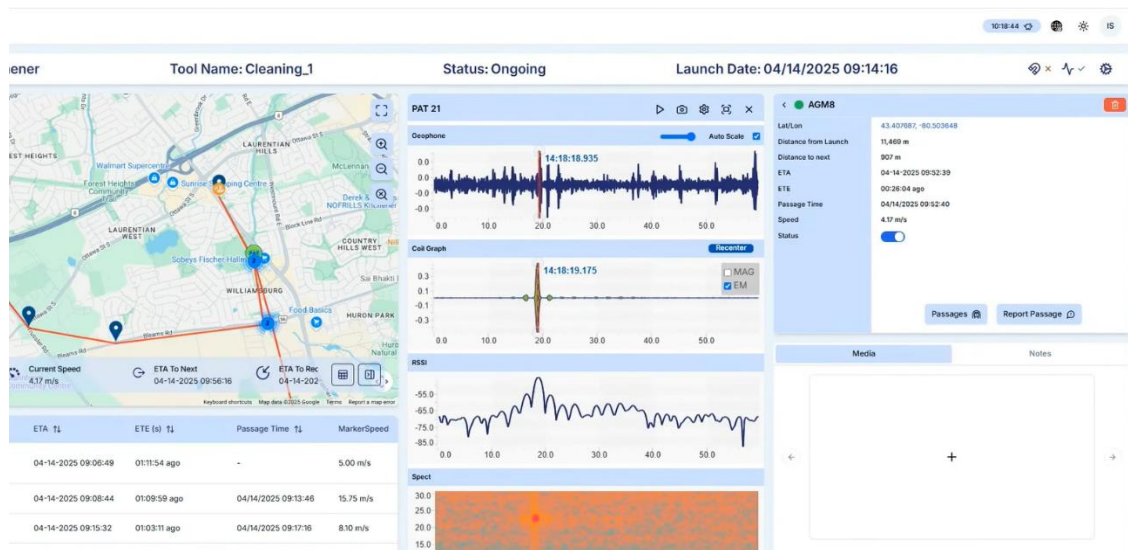


PIGRUN'S SOLUTION'S ROLE

Three **cellular-enabled Patriot AGM units** were deployed, and one remote tracker was assigned to monitor the job. The units were pre-deployed prior to the run and moved strategically along the pipeline to cover approximately 20 marker locations.

Key details:

- Pig speeds were around 5 m/s in the first half of the line and slowed to ~1 m/s in the second half.
- A combination of **field deployment and remote tracking** was utilized to minimize field presence and optimize coverage.
- All passes were successfully detected and reported in real time.



WHAT SETS PATRIOT AGM APART

The Patriot AGM is a **compact, all-in-one remote tracker** designed to simplify fieldwork while maximizing sensitivity and performance. Unlike traditional systems that require bulky equipment, Patriot AGM integrates:

- **Built-in sensors** (electromagnetic and geophone)
- **Optional external sensor connections** to enhance detection of quieter pigs and challenging EM signals
- **Bluetooth and cellular connectivity**, enabling both local and remote control

Each Patriot AGM deployed during this operation was able to **detect and report all pig passages** reliably to the PaTrack Dashboard.

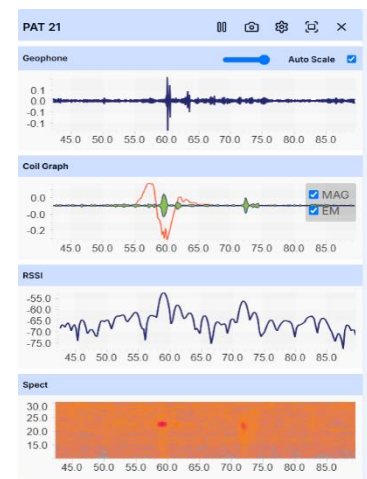
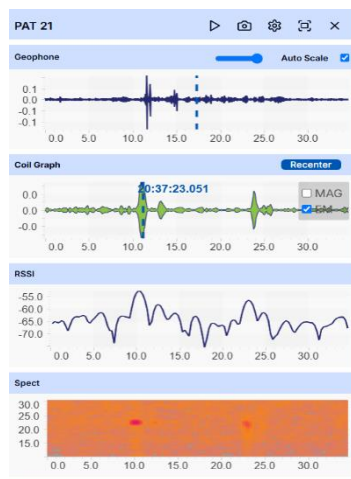
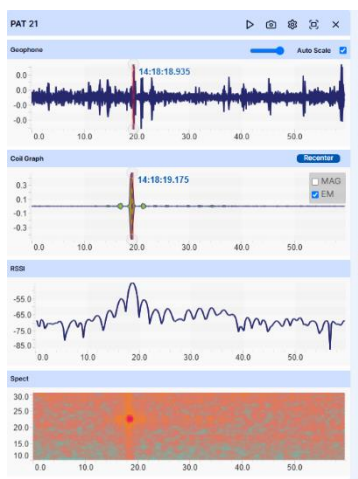


REAL-TIME TRACKING WITH PATRACK DASHBOARD

The **PaTrack Dashboard** enabled the remote tracker to:

- Receive **passage alerts within seconds**
- View **live signal graphs** and **stream real-time geophone audio**
- Track the pig's progress without being physically present at each site

These capabilities significantly improved operational oversight and efficiency, making it easier to adapt to last-minute field changes and challenging terrain.



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POWERFUL MOBILE APP SUPPORT

Our Android app, **PATCONNECT**, played a critical role in supporting local tracking. Key features include:

- **Long-range Bluetooth connectivity**, often exceeding 100 meters in open environments
- **Live geophone audio streaming**, accessible via wired headphones or wirelessly through the vehicle's Bluetooth
- **Real-time waveform display**, aiding quick signal interpretation
- **Automatic weld counting**, reducing manual tracking effort and human error

This intuitive tool allows field technicians to operate more efficiently, with fewer distractions and less equipment.



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CHALLENGES & LESSONS LEARNED

- Some marker locations could not be reached due to road closures and construction. Full pre-deployment would have mitigated this.
- A fully pre-deployed setup could have allowed for faster pig launching and less field technician repositioning, improving **efficiency, safety, and cost-effectiveness**.

CONCLUSION

Despite field access limitations, the Patriot AGM units and supporting systems **successfully tracked all cleaning pigs and the gauge plate** throughout the job.

This demonstration validated:

- The **reliability and accuracy** of Patriot AGM in real-world conditions
- The **effectiveness of remote tracking via the PaTrack Dashboard**
- The **operational benefits** of minimizing field presence without sacrificing data quality

We thank the service provider team for their excellent coordination and look forward to continuing to support future Enbridge operations.



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