

## Diagnosing microbiologically influenced corrosion at a crude oil pipeline facility leak site – a holistic approach

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An internal corrosion leak site on a pipe at a crude oil facility was investigated using a holistic approach (chemical, microbiological, and corrosion analyses) to assess whether the failure was at least partially due to microbiologically influenced corrosion (MIC). The pipe leak occurred at the 6 o'clock position on a bypass segment that received minimal fluid flow. Such a location, also known as a dead leg, is susceptible to under deposit corrosion. The effects of chemical preservation on the samples, and the choice of primer sets used for microbial community analyses were also evaluated. Shotgun metagenomics sequencing was conducted for the pinhole leak site sample to determine the metabolic potential of microorganisms that may have contributed to the leak. Fermentative organisms producing organic acids, methanogens, sulfur-/thiosulfate-reducers, biofilm-forming organisms, and organisms able to withdraw electrons directly from the steel - all metabolisms known to play a role in MIC - were identified in these samples. The study describes the importance of not only collecting different kinds of evidence to support MIC but also the importance of comparing samples from corroded and non-corroded areas to provide a strong case for infrastructure failure due to MIC.

### Dr. Mohita Sharma

- Mohita has more than 5 years of experience in planning, executing and leading applied projects in the field of environmental and petroleum microbiology. She has led projects related to the biomonitoring of environmental samples from pipelines, produced waters, and sludge environments; biodegradation and MIC testing; preparation of mitigation strategies for industry operations; testing the efficacy of different chemicals for field applications and their effect on microbial populations; and developing sustainable technologies for wastewater treatment and bioremediation for industry-academic partnerships in Canada, India, Europe, Australia, and the US.
- Mohita has a PhD in Environmental and Industrial Biotechnology, an MSc in Plant Biotechnology, and a BSc in Microbiology.
- Mohita is a Lead Postdoc researcher for a Genome Canada-funded Large Scale Applied Research Program (LSARP) grant, entitled Managing Microbial Corrosion in Canadian Offshore and Onshore Oil Production Operations, also known as geno-MIC.
- Currently, she is finishing her Industrial Postdoc with Shell in collaboration with University of Calgary and the geno-MIC project and is looking for new opportunities.

