

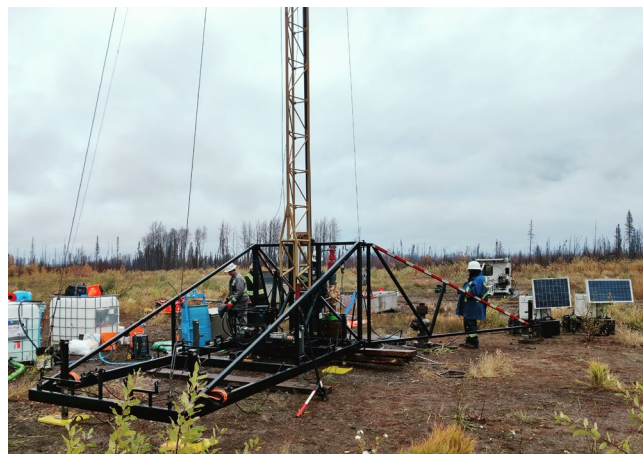
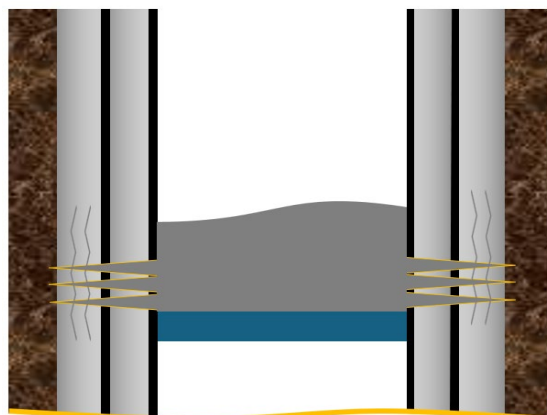


## Case Study: Elimination of Gas Migration Using TSN-25 in Northern Canada Remote Location

The subject well is located north of Fort Nelson, British Columbia, Canada. The wellsite is surrounded by muskeg and is accessible only by helicopter, creating significant logistical constraints for conventional cement remediation operations.

Gas migration was identified through the annulus between the conductor pipe and the surface casing. Prior to remediation, the operator modified the wellhead to enable vent gas measurement. The average vent gas rate was 0.11 m<sup>3</sup>/d (3.89 scf/d), with shut-in annular pressure building to 146 kPa (21 psi).

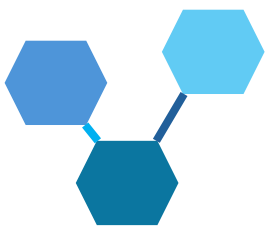
To access the fugitive gas migration pathway, a 2 m (6.6 ft) perforated interval was created to pierce both the 139.7 mm (5.5 in) production casing and the 244.5 mm (9-5/8 in) surface casing. A bridge plug was set 0.5 m (1.6 ft) below the lowest perforation to provide a mechanical base for sealant placement.



The TSN-25 standalone nano-modified polymer sealant was flown in by helicopter. The sealant was mixed on location and then conveyed to depth using wireline and a dump bailer. Following placement on top of the bridge plug, water was pumped from surface to displace approximately 50 L (13.2 gallon) of sealant behind the production casing and into the annular leak pathway.

The well was then shut in overnight to maintain pressure on the sealant during curing at an estimated downhole temperature of 10–12 °C (~50°F).

Fourteen (14) days after sealant placement, the operator reinstated wellhead gas monitoring. No vent gas was detected during the required monitoring period. Based on the sustained absence of gas flow, the well received regulatory approval to proceed with cut-and-cap decommissioning, with no additional remediation required.

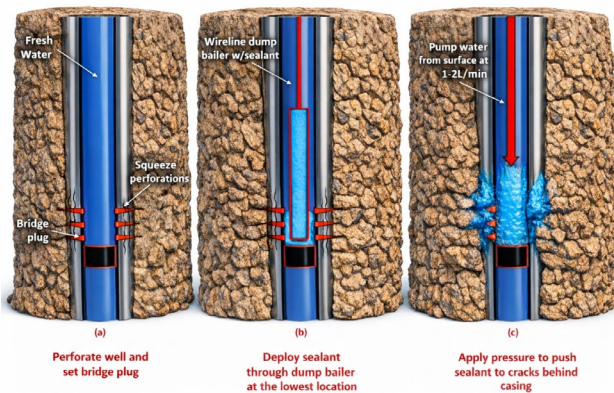


# Case Study: Elimination of Gas Migration Using TSN-25 in Northern Canada Remote Location

## Performance Specification

Characteristic	TSN-25
Crack Penetration	< 20 microns
Workable time*	2 hrs +
Downhole temperature	10 – 120 °C / 50 – 250 °F
Bond Strength to steel	7.0 MPa / 1,000 psi
Elongation at break	8 – 12%

\* *Workable time can be engineered to tailor operation needs.*



## Why TSN-25 Was Selected for This Well?

- **Small-volume, wireline-deployed** — suitable for helicopter-only access
- **Minimal surface equipment** — low-rate water displacement only
- Seals **micro-annular leaks** that cement may bypass
- **Effective across dual-casing pathways**
- Reliable **low-temperature** cure (10–12 °C)
- **Ductile seal** that maintains integrity over time

## Contact Us

[info@ts-nano.com](mailto:info@ts-nano.com) | 
 [www.ts-nano.com](http://www.ts-nano.com) | 
 ☎ +1 (505) 385-8930 US  
 +1 (587) 707-9384 Canada