

SNOW TRAIL TEMPERATURE MONITORING FOR ARCTIC EXPLORATION

CASE STUDY



LINC ENERGY

, Alaska, USA



In 2012, Australia-based Linc Energy initiated an ambitious oil and gas exploration project in the National Petroleum Reserve, Alaska (NPR-A). This vast, isolated area spans 23.5 million acres and presents significant logistical and environmental challenges. The project's success hinged on constructing a reliable 100-mile snow road to transport supplies and equipment to remote drill sites. **beadedstream** played a critical role in this endeavor, providing a comprehensive temperature monitoring solution that ensured compliance with environmental regulations and extended the exploration season.

Application

Linc Energy's exploration required a snow road beginning at the Dalton Highway and stretching westward across state, federal, and native lands. Unlike ice roads, snow roads do not require large volumes of water, making them more suitable for the harsh, resource-scarce environment of northern Alaska. However, snow roads can only support low ground pressure equipment, necessitating careful planning and construction. The route crossed several major drainages, including the Kuparuk, Itkillik, Chandler, Anaktuvuk, and Colville rivers, requiring meticulous coordination with multiple regulatory bodies.



Aerial view of the National Petroleum Reserve, Alaska, captured from a helicopter during installation.



beadedstream team installing temperature monitoring gear at a snow station in the tundra

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beadedstream Solution

To ensure the road's viability and minimize environmental impact, **beadedstream** deployed a two-person crew to install 40 tundra digital temperature cables (DTCs) and 20 satellite D405 data loggers along the 160-kilometer (100-mile) route. Using helicopter support from Pathfinder Aviation, the team completed the installation in just two days. Each data logger was connected to two DTCs: one monitoring the snow trail and the other monitoring the surrounding areas. The DTCs were instrumented with four sensors placed every 0.10 meters up to 0.30 meters (1 foot) depth with a lead length ranging from 9.75 to 12 meters (32 to 39 feet). These cables, connected to satellite loggers, provided precise real-time temperature data of the tundra soils beneath the trail from August 2012 to June 2013. This data was crucial for Linc Energy to meet environmental regulations and maximize operational days.

For the 2013-2014 winter season, they reused and reinstalled 24 of the DTCs to monitor another 12 stations during that year's operational program.

beadedstream Solution Benefits

beadedstream's efficient and thorough installation allowed Linc Energy to commence their project on schedule, providing robust data and operational flexibility. By utilizing all ports on each data logger, Linc could monitor both the trail and surrounding areas simultaneously, ensuring comprehensive temperature data collection. This strategic approach enabled Linc to demonstrate regulatory compliance and protect the tundra from lasting impacts. The detailed temperature monitoring facilitated by **beadedstream's** technology was instrumental in documenting the seasonal freeze-back of near-surface soils, supporting the project's environmental and operational goals.

By partnering with **beadedstream**, Linc Energy successfully navigated the challenges of remote Arctic exploration, achieving a balance between operational efficiency and environmental stewardship. The collaboration not only ensured regulatory compliance but also protected the sensitive tundra environment, allowing for a sustainable approach to oil and gas exploration in one of the world's most challenging regions.



beadedstream team installing digital thermistor strings and a data logger at a tundra monitoring station, with a helicopter in the background.



Chris Burgess, former beadedstream project manager, smiles at the camera with a D405 data logger and a helicopter in the background.