

Wireless SPR: At-Bit Position Verification Without Surface Coils

NOR, Vikedal | NRB HDD Pilot bore | 311mm (12.25"), 822m(2696') Md, 216m (708') elevation gain.

When planned walkover verification could not be completed, NRB deployed Hazen Single Point Ranging (SPR) for independent at-bit positioning and steering guidance. Mobilized from Calgary to Norway, SPR was operational within 10 days and supported by Hazen survey management, with Bedrock combining MWD and ranging data for real-time visualization and proximity calculations. The 822m(2,696') bore exited within 20cm(7.8") of the center of a 1m(3.3') target.

Challenge:

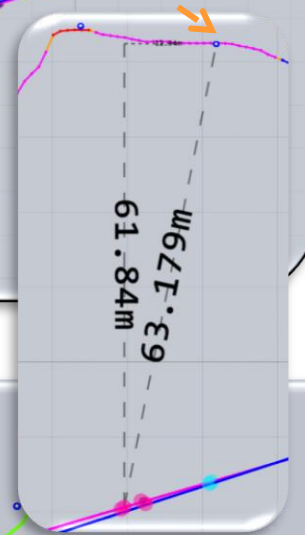
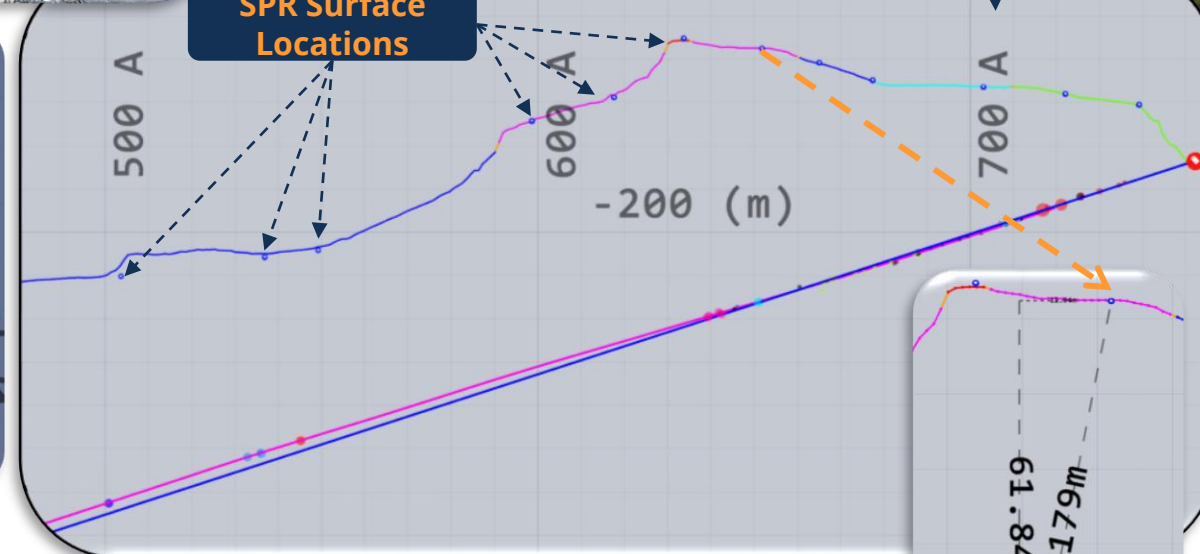
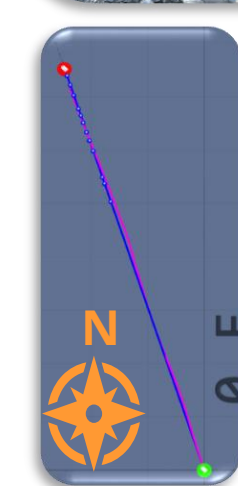
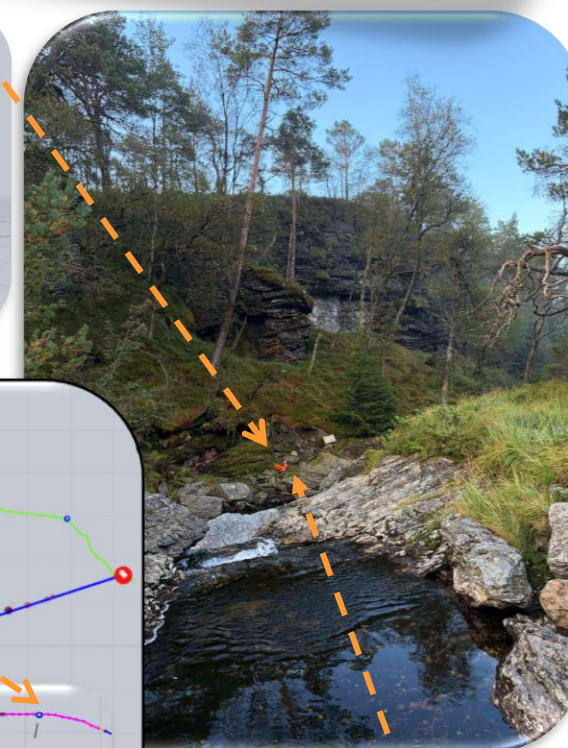
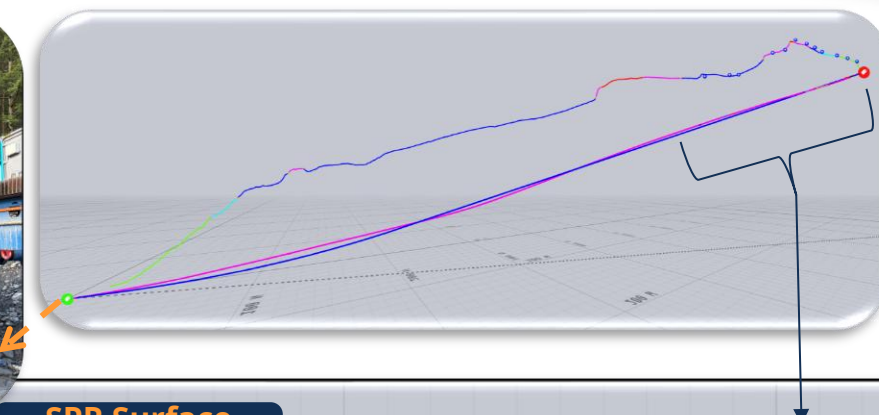
NRB was drilling an 822 m hard-rock HDD where accurate exit placement required confidence in both the surveyed trajectory and actual bit position. Hazen was already providing survey management to optimize the MWD data and maintain the best possible calculated bore position. With the bore beyond 550 m, independent position verification was required. The planned walkover method could not provide that confirmation, while conventional surface-coil tracking would require additional access and installation along the bore path. The team needed a solution that could be deployed quickly, reach the required depth and integrate with the existing drilling program.

Solution: Wireless SPR (Single Point Ranging)

Hazen mobilized SPR from Calgary to Norway and was providing ranging measurements within 10 days of callout. SPR offered a wireless alternative to conventional surface-coil tracking, using sensors at surveyed surface locations to independently verify bit position from the downhole magnetic signal. Successive measurements confirmed the surveyed trajectory and showed how the bit responded while sliding and rotating. Hazen then used drill-to-target calculations to convert measured position into specific steering headings toward the exit target. MWD and SPR data were combined in Bedrock for real-time visualization and proximity calculations, giving the local drilling team and Hazen's remote support in Canada a shared view for decision-making.

Result:

The 822m(2,696') bore exited within 20cm(7.8") of the center of a 1m(3.3') target. — demonstrating precise, deep at-bit position verification without deploying a conventional surface coil along the bore path.



SPR at exit target

