



CUSTOMER STORY

Rv.4 Hunndalen - Mjøsbrua

Norway





Project facts



Location: Gjøvik, Norway



Customer: Nye Veier AS



Project duration: 2025



Project type: Road Planning



Project size: 2 7000 hectare (2.7 km²)

Key results

Significant risk reduction through improved knowledge of ground conditions along tunnel corridors – in particular:

- Integrated top of bedrock ground models with quantified uncertainty
- Imaged critical rock deformation structures (faults and/or folds)
- Risk for problematic black shale units along tunnel axes.
- Probabilistic soil type interpretation in areas with significant heterogeneity.



1. Background

Nye Veier received assistance from EMerald Geomodelling before designing and building tunnels for the new rv.4 highway along the west-coast of Norway's largest lake Mjøsa.

The new 20-kilometer road between Gjøvik and Mjøsbrua will improve living and working conditions in the area by reducing travel time and enhancing traffic safety. The current road has a 70 % higher rate of serious accidents including head-on collisions and is thus prioritized for development. Nye Veier is responsible for the project and Norconsult is the consulting engineer for the planning assignment. The planning work started in 2025. A key geotechnical challenge for the project is to identify the ideal placement of a tunnel under the regional city of Gjøvik where only very limited ground investigation data is available in the early phase of the project.

The EMerald Geomodelling team was brought into the project in close partnership with SkyTEM Surveys of Denmark following a joint development project resulting in a new generation geoscanner, perfectly suited for the semi-urban environment of the tunnel planning project

NORWAY

Innlandet

Gjøvik

SWEDEN



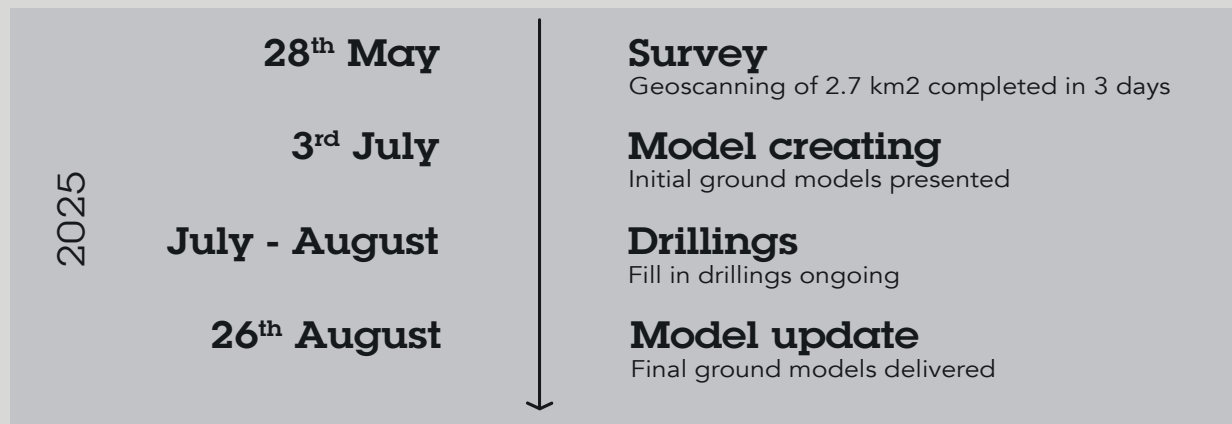


2. How it was done

For the first time in Norway a new-generation high-resolution Geoscanning sensor, the SkyTEM Diamond system was deployed using a small helicopter able to fly slow and low in areas close to and surrounded by dense population. Three critical areas for the planned tunnels, totalling 2.7 square kilometres, were covered in three days of flying.

While geophysical data were processed by specialists at SkyTEM, the EMerald team prepared the sparse geotechnical data for integration through the EMerald Geomodelling™ ML workflows. To enable efficient planning work, initial ground models were presented to Nye Veier's engineers five weeks after survey completion. Final models integrated with design-critical analysis were available two months after that including a one-month summer break.

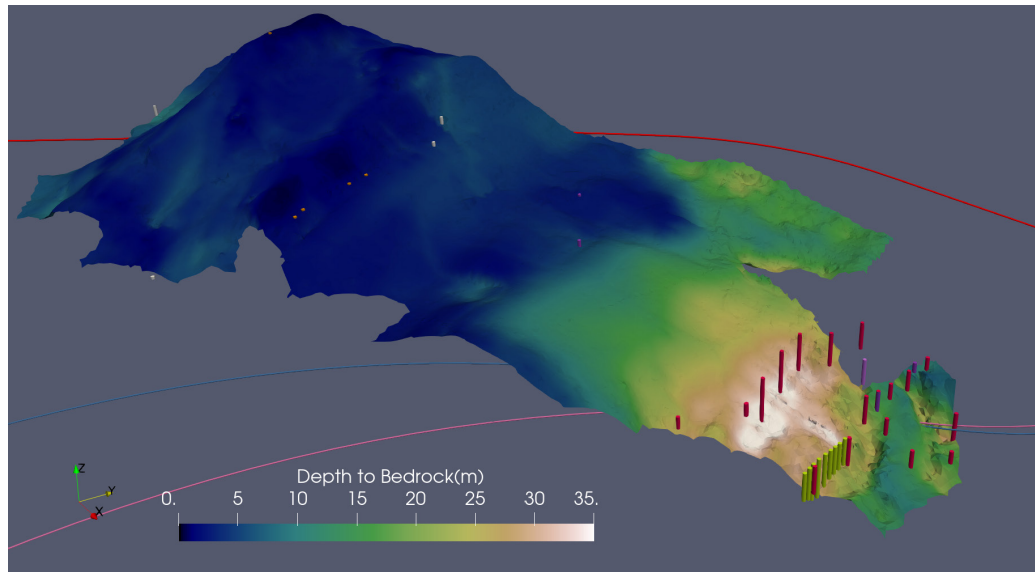
Project timeline



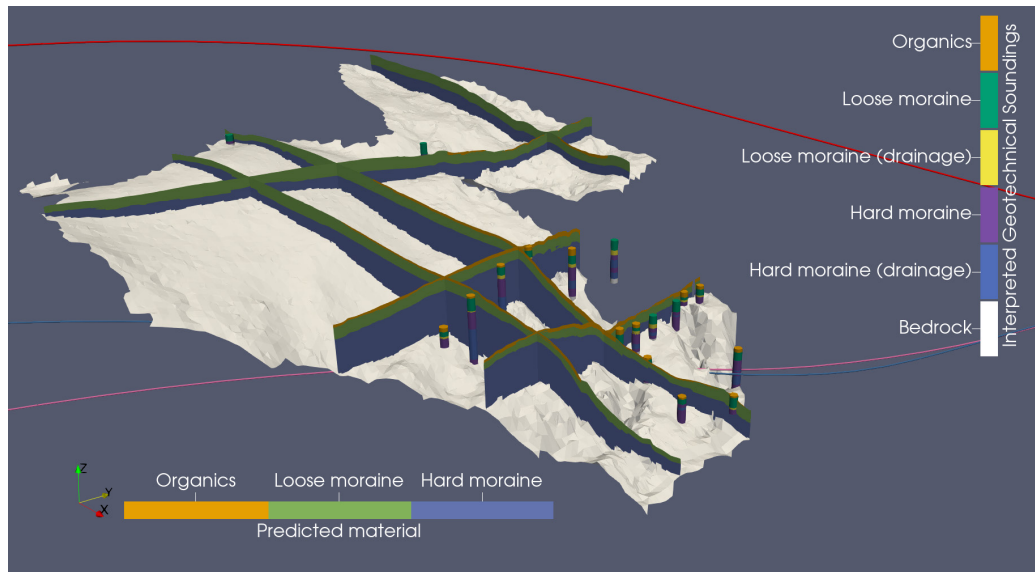


3. Deliveries to customer

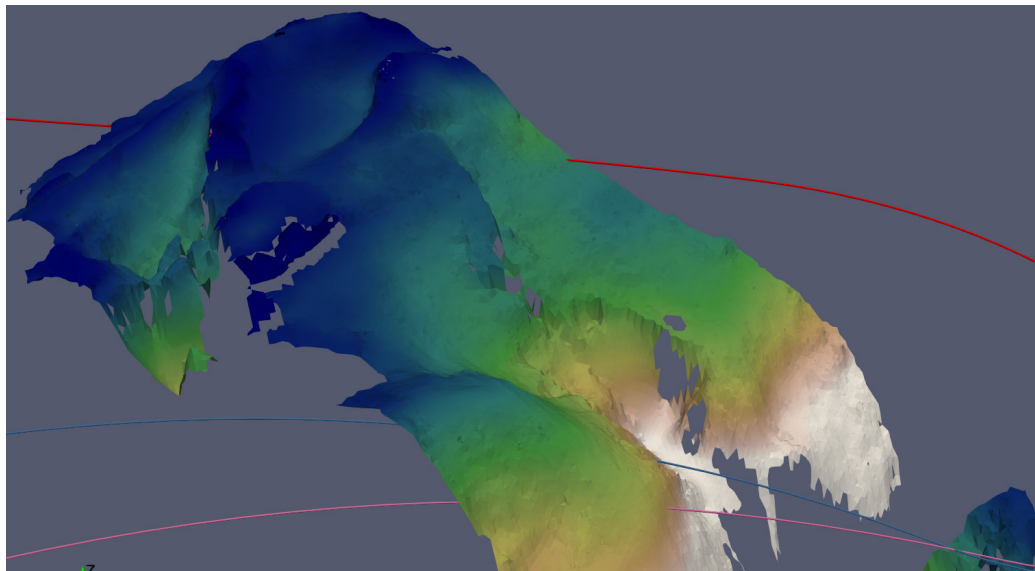
(Depth to) Bedrock model
including locations of sparse ground investigations
(geotechnical soundings, wells, outcrops, interpreted
seismics)



Soil type model
including interpreted geotechnical soundings



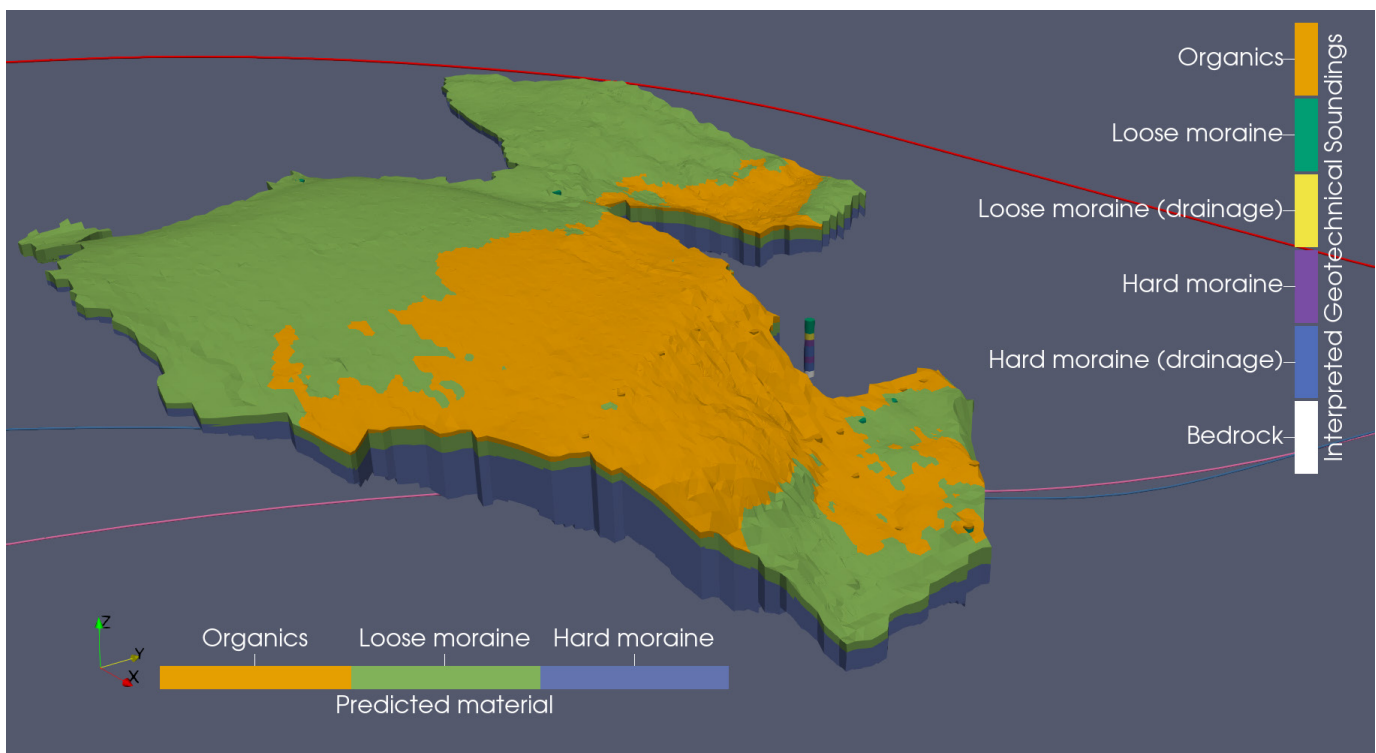
Top of black shale model
along with tunnel route alternatives



4. Customer results + actions taken

Before geoscanning, the project faced significant uncertainties in ground conditions as only very sparse datapoints from existing and newly drilled geotechnical soundings and samples were available. Choosing a sub-optimal tunnel alignments would have involved significant risks, and potential cost increases later in the project.

The integrated EMerald ground models provide full coverage and allow for data driven decisions with quantified uncertainty. Whether a tunnel is dug in soil or rock determines costs, resources and construction emissions, these risks are now considerably reduced as tunnel options can be assessed with respect to top of rock surface and existence of black shale units. Critical locations can now be identified and followed up with well-placed soundings and sampling.



The seamless ground model considerably improved our knowledge and enabled planners to make data driven decisions in terms of route optimization and designing further drilling & testing plans

Roy Nalbant

Senior Geotechnical Engineer, Nye Veier



How we can help your company

1

Fast survey for large-scale project area

We collect electromagnetic data by conducting an airborne geoscanning survey. This delineates the subsurface and generates a resistivity model.

2

30-40% fewer drillings by utilizing high data accuracy

Based on the collected data and calculations, drilling is strategically executed by our customers at optimized locations, based on the uncertainty map.

3

Intelligent and efficient decision-making leading to substantial cost savings

We build a 3D model powered by the machinelearning algorithm to provide critical geological insights.

Interested in learning what we can do for your project?



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