



## Unpaved access road over muskeg/poor soil

# MEG Energy

## Christina Lake site, north of Conklin, AB

In 2012, MEG Energy's oil sands mining operations at the Christina Lake complex in northern Alberta were expanding. Plans included new wells, processing, operations, storage and treatment facilities, as well as the roads needed to interconnect them. The saturated, organic soil in this region combined with harsh climate conditions made conventional road building difficult at best. Freezing in winter combined with heavy rains and poor drainage in summer typically impeded construction efforts almost year-round.

The client needed an access solution that would increase the bearing strength of the road base, provide a durable, all-weather road that was economically feasible, and could be completed before winter.

Paradox Access Solutions proposed a design for the road using ToughCell® geocells. Utilizing locally available materials for infill, this innovative geosynthetic cellular confinement system increased the modulus of the existing subgrade and built a road, virtually over water, capable of supporting 500,000 ESALs.

### PERFORMANCE RESULTS:

"An incredible milestone!" Intended for a six month period, the Phase 3A Access Road remains in excellent condition today and is still in frequent use after five years of service.

# CASE STUDY



## LOAD SUPPORT

### PROJECT AT A GLANCE

**APPLICATION:**  
Unpaved Access Road

**LOCATION**  
Alberta, Canada

**DATE OF INSTALL:**  
July-August 2012

**CLIENT:**  
MEG Energy



A Canadian oil sands company focused on sustainable in-situ development and production in the southern Athabasca oil sands region of Alberta.

**CONSTRUCTION:**  
Paradox Access Solutions



The authorized Tough Cell® Master Distributor in North America, specializing in the supply and installation of high quality access solutions and services to customers in the pipeline, utility, municipal, general construction and oil & gas industries.

**ENGINEERING DESIGN**  
Stratum Logics Inc.



Global geotechnical engineering design specialists exceptionally proficient in the deployment of cutting-edge geosynthetics for civil engineering across North America in all types of challenging soils and climates.

# Project Highlights

## Unpaved access road over muskeg/poor soil

### THE CHALLENGE

The existing soil in the area consisted of muskeg more than 1 meter deep, with a moisture content greater than 800%. Conventional construction methods necessitated removal and replacement of the muskeg material. The cost of importing replacement infill along with installation of drainage systems proved prohibitively expensive.

### THE SOLUTION

Paradox Access Solutions provided a design utilizing two layers of Tough Cell® NPA geocells. Instead of replacing the problematic muskeg, a layer of non-woven geotextile was placed directly over it. An initial layer of Tough Cell® was then installed over the geotextile and infilled with up to 1m of clean sand from nearby borrow pits, stabilizing the subgrade and improving its bearing capacity. A second layer of non-woven geotextile followed, to further separate the subgrade from the Tough Cell® layers. The second Tough Cell® layer was then placed and infilled with crushed gravel, distributing the load horizontally to reduce stress and settlement.

**Total area:** 3.2 km length x 8m width

**Product(s):** 36,000m<sup>2</sup> 330-150-ToughCell Geocell; Woven and non-woven geotextile

**Infill:** Locally sourced sand; crushed gravel

**Completion:** 175 mm height gravel wearing course.

### THE BENEFITS

The client benefited from:

- an engineered solution that offered the only viable alternative to traditional road construction
- increased bearing capacity and longevity of a road that would meet the heavy traffic demands
- the use of locally available sand, minimizing the import and quantity of aggregate



Condition of access route through muskeg



First layer Tough Cell® installed, ready for sand infill



Drainage installed



Second layer Tough Cell® infilled with gravel



Final compaction of finished road surface



Completed road accepting heavy truck loads