

Geotechnical Surveys

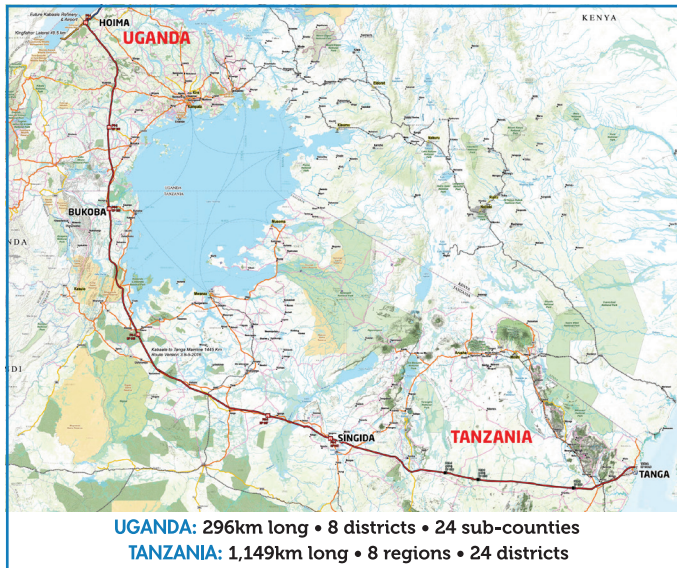
- **Observation/Trial pits:** Shallow pits dug by hand or mechanical tools to expose the soil layers for easy visual examination.

Trial Pits Tanzania 423 Uganda 106

Observation Pits



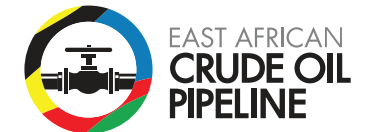
THE EACOP ROUTE MAP



The geophysical and geotechnical surveys will be conducted along the pipeline route for approximately 1,445km. This pipeline will transport Uganda's crude oil from Kabaale- Hoima in Uganda to the Chongoleani Peninsula near Tanga Port in Tanzania for export to international markets.



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THE GEOPHYSICAL & GEOTECHNICAL SURVEYS

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Why do we need to study the soil?

As part of the preliminary studies, before construction of the East African Crude Oil Pipeline (EACOP), the soil profile will have to be studied to understand the soil and sub-soil conditions and suitability of the site for construction of the pipeline. The study will enable us:

- Locate any buried services such as electric power cables, water mains and sewers.
- Investigate the presence of geological faults and the possibility of earthquakes.
- Identify unstable soil and potential landslides.
- Assess the presence of wetlands and areas prone to flooding.

Why do we need all this information?

To enable the EACOP technical team make well informed decisions on:

- Types of foundations required for above ground installations such as pumping stations, electrical stations, etc.
- Safe digging depths required for the pipeline, and
- Assessments on the risks related to loading conditions as regards the stability of the structure.

From these assessments, the EACOP Project engineers will be able to make detailed technical and economic designs with adequate understanding of the ground conditions.

How are the studies conducted?

The studies will be conducted through:

- Geological studies
- Geophysical studies
- Geotechnical studies

Geophysical Receptor



Geological Studies

A team of geologists will walk along the future pipeline route to observe the rocks and perform geological mapping.

Geophysical Surveys

The Geophysical survey is going to complement the Geological mapping by providing information for the study of the sub-surface conditions, which may give constraints for the construction of the pipeline and other installations.

The seismic acquisition will be done along specified lines located along the pipeline route in areas where there is uncertainty on soil and ground conditions.

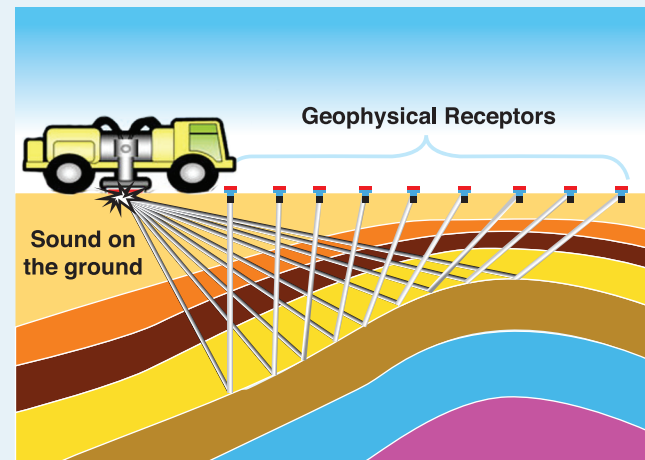
A geophysical line:

Individual length ranges from 300m to 5000m

| | | | | |
|----------|-------|-----|--------------|-------|
| Tanzania | Lines | 170 | Total length | 100km |
| Uganda | Lines | 70 | Total length | 35km |

How seismic acquisition works:

A tractor with a weight (5kg) is used to make a sound on the ground and send signals which cross the sub-soil layers of the ground, bounce back on the geological layers and are received by receptors positioned on the surface of the ground.



The receptors record the signals that are used to produce detailed images of the earth.

The images are assessed and analyzed and utilized to design the pipeline installation.

Geotechnical Surveys

Geophysical methods do not give all the information required to make engineering decisions, the geotechnical studies will provide additional information to make these decisions.

A Geotechnical study will:

- Confirm the suitability of the location of the pipeline route and the above ground installations
- Locate potential obstacles along the proposed route, and where alternatives exist, advise on the suitability of the alternatives.

All information and results obtained from the geophysical and geotechnical studies will enable the project team design foundations and structures for the pipeline.

The Geotechnical study methods will include:

- **Boreholes:** To acquire soil samples, boreholes are drilled using a portable rig of approximately 600kg in weight, to a depth of 6 to 60m to enable the extraction of soils, rocks and water samples from the ground.

| | | | | |
|-----------|----------|-----|--------|----|
| Boreholes | Tanzania | 245 | Uganda | 45 |
|-----------|----------|-----|--------|----|

- **Laboratory testing:** The soils, rocks and water samples are then studied in a laboratory to determine properties, structures and characteristics.

Soil Samples



- **Groundwater monitoring:** Metre devices called, Piezometers are installed to measure the level of ground water.

| | | | | |
|-------------|----------|-----|--------|----|
| Piezometers | Tanzania | 185 | Uganda | 46 |
|-------------|----------|-----|--------|----|