

# Progress update

## Escravos Gas-to-Liquids NIGERIA

**In the past 18 months, the Escravos Gas-to-Liquids (EGTL) site in Nigeria has been transformed from a mangrove swamp surrounded on three sides by water, to a fully-reclaimed working area covered by an eight metre thick sand fill blanket.**

Site improvement, including the installation of many thousands of 20- and 40- metre deep vertical wick drains and a ground water pumped extraction system, is currently underway. This is causing the underlying soft clay strata to settle and consolidate in a controlled manner. The works are being carefully monitored by settlement beacons and buried clusters of soil parameter measurement instruments. Results to date show clearly the correlation between predicted and measured settlement.

When work is complete, the overall settlement of the site is predicted to be six metres for an achieved ground consolidation of 90%. To Foster Wheeler's knowledge, no other industrial site in the world has been subjected to such a degree of settlement and consolidation by modern geotechnical techniques.

In conjunction with the site improvement, Foster Wheeler has been analysing and developing foundation systems suitable for the EGTL plant.

Ground settlement predictions under large product storage tanks have been confirmed by 3-D and 2-D finite element analysis to check that tanks with floating roofs may be founded on traditional ring beams installed on the consolidated soils.

Allowable future primary and secondary ground settlement limits have been established. Design curves have been developed by computer program to ensure that the most economical foundation types are selected to suit process unit weights, sizes and sensitivities to differential ground movements.



Left to right: David Steveni, senior construction engineer, FW; Mark Rogge, senior engineer, FW; Bill Simpson, construction engineer, CNL; Doug Grauel, construction engineer, CNL.

The site team comprises personnel from the client, Chevron Nigeria Limited (CNL) and NNPC, Foster Wheeler and Thales, the geotechnical consultant. They will continue to monitor settlement progress while the Foster Wheeler home office civil engineering team, led by Watson Leslie, prepares drawings and specifications to be issued by 1 October to prospective tenderers for the engineering, procurement and construction contract.

David Robertson, Foster Wheeler's project director, commented: "The effort and contribution made by the civil engineering and construction team associated with this complex activity should be acknowledged. This has required close co-operation and co-ordination between the parties involved including the client's representatives (CNL and NNPC), Foster Wheeler and Thales."



*ers, construction planning manager, CNL; Watson Leslie, lead civil  
onstruction manager, CNL; David Robertson, project director, FW.*



*Site - March 2001.*