

# Geosynthetic Cap at Auchenlosh Landfill Site

The Auchenlosh Landfill site, in a former granite quarry near Dalbeattie, is owned and operated by Armstrong Waste Management Ltd. The 70 acre site has been accepting non-hazardous wastes over many years and today is a major disposal site for the Dumfries and Galloway region.

A total surface area of 36,000m<sup>2</sup> had to be capped in the landfill, with slopes of 1 in 3 and 1 in 4. The project was to provide an impermeable barrier to waste material and surrounding soil as well as an effective drainage system for surface rainwater. When completed, the cap would be grass seeded and landscaped.

## CASE STUDY

Project Name:	<b>Auchenlosh Landfill Capping</b>
Date:	<b>August 2012</b>
Client:	<b>Armstrong Waste Management Ltd.</b>
Consultants:	<b>Fairhurst, Glasgow</b>
Product:	<b>Bentofix<sup>®</sup> NSP 4000, Secudrain<sup>®</sup></b>

**NAUE supplied products and provided engineering expertise for a geosynthetic landfill capping project carried out by Armstrong Waste Management at its Auchenlosh Landfill Site in Dumfries and Galloway, South West Scotland.**





Current legislation requires landfills to be capped to strict standards and the Auchenlosh project had to comply with the requirements of the Scottish Environmental Protection Agency (SEPA) in accordance with the Landfill Directive.

Armstrong Waste Management, working in conjunction with design consultants Fairhurst, decided to carry out all installation work on the capping project 'in-house'. Mike Rae, managing director of Armstrong Waste Management, explains: "Although we had not tackled such an undertaking before we were confident that with the design engineering support of Fairhurst and NAUE Geosynthetics we would achieve a successful result. When considering the various capping methods available, the lack of any local clay reserves quickly ruled out using traditional compacted clay methods. HDPE lining methods were also dismissed because of issues with placement on slopes, and because polyethylene joints would require on-site welding using specialist equipment and certified installers. It was decided that a complete geosynthetic solution from NAUE would be the most cost effective option and would mean that our team could handle the task of installation without difficulty."

For sealing, NAUE Bentofix® NSP 4000 Geosynthetic Clay Liners (GCLs) were specified, with NAUE's Secudrain® employed to drain

water. Multi-directional shear strength-transmitting Bentofix® needle-punched GCLs are ideal for use in steep slope landfill applications up to 1 in 2.5. Bentofix® consists of a layer of 100% natural sodium bentonite encapsulated between two layers of needle-punched geotextile material. Secudrain® geosynthetic drainage systems effectively divert rainwater to a collection or drainage pipe; minimising standing water build-up on the sealing element. The Secudrain® system does not impede the hydration of the Bentofix® by water contained in the top soil, allowing full hydration to occur. Secudrain® is a three-dimensional composite product, consisting of a drainage core and firmly attached filter nonwoven geotextiles.

NAUE design engineers provided stability assessment design support by evaluating interface shear stress between Bentofix®, Secudrain® and the soil cover to prove that the internal shear stress of the GCL was sufficient to

meet design criteria. Shear box testing was carried out in compliance with euro code 7 and, in conjunction with Fairhurst, NAUE were able to advise Armstrong Waste Management on current SEPA guidelines.

Mike Rae adds: "I'm pleased to report that the project was successfully completed on time and within budget. Although the capping of landfill is an on-going process at the Auchenlosh site the success of this initial project has set a very high standard to follow in future works. NAUE's professionalism, their efficient approach to service, and their engineering expertise, contributed greatly to the success of the project. Their products fully met our expectations and we were able to install the 50 metre long Bentofix® rolls by simply unrolling and overlapping at the joints, and then covering with top soil – it just couldn't have been easier. From both a customer and installer standpoint, I would be happy to recommend NAUE and its products to anyone."



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