

# PERMATHENE NEWS

No 5

August 2004

**T**his newsletter includes a few projects including landfill lining and installation, de-watering, waterproofing and irrigation. Also covered in this issue are several new products including high strength PET geotextiles and geogrids.

We also welcome new staff including Mr. S.P. Gupta, BE (Civil), DCM, who now heads our office in India and Mr. Darren Tolley, NZCE (Civil), Sales Engineer for our Auckland office.

Our installation crews currently comprise two dedicated teams specialising in the on-site fabrication and installation of FPP, HDPE, LLDPE, GCL, high strength geotextiles, etc.

Methods include extrusion and fusion welding, sewing to double type 401, J seam specification, testing including tensile, peel, pressure, electric spark, etc.



## Technical Resources

### Permathene Catalogue:

Is now available on CD or directly off our website. An interactive library of information including case studies, product data sheets, QA/ QC Manual. The CD version also includes a slideshow tour of some recent projects.

We have provided this information to assist designers and contractors and have taken the approach to make it freely available, even to our competitors!

Should you prefer the CD, contact us.

### Design Software:

E'GRID® Walls and Slopes Design software for our uni-axial geogrids is now available to engineers, contact us for your copy.

# Projects

## Landfill

Taupo District, New Zealand

Several landfill projects have been completed this year including the use of both flexible polypropylene (FPP) and high density polyethylene (HDPE) geomembranes and geosynthetic clay liner (GCL). The project as follows was completed in March 2004.

Permathene was contracted to supply and install the lining system for the extension of the Taupo District Landfill. The civil contractor prepared the base and Permathene installed the lining system in a 4 week period. Due to the environmental impacts of landfills, stringent testing regimes were put in place.



The GCL was installed before the HDPE sheets were lapped and joined using a twin track, hot wedge-welding system. The double seam gives extra security against leakage and also provides a sealed tube between the two seams that was finally pressure tested to ensure that the adequate seal was achieved. The fusion welds were tested for peel and shear strength using a field tensiometer. All extrusion welds were spark tested to check their integrity.

The success of a project of this type depends greatly on the correct choice of material and correct installation procedures. Materials must be matched against factors including ground conditions, chemical and mechanical strengths, cost. It is therefore important that a system is designed by a geotechnical engineer who understands material characteristics and that a specialist installation contractor is engaged to install the lining system in accordance with specifications.

## Waterproofing

Sakhalin Island, Russia

Chicago Bridge & Iron, one of the worlds largest engineering, procurement & construction companies was awarded a US \$95 million contract for the supply and construction of two 100,000 cubic metre full containment Liquid Natural Gas storage tanks at the planed Aniva Bay LNG plant, Sakhalin Island, Russia.

CB & I were also contracted to build a concrete batching plant to supply concrete for the production facility and storage tank foundations.

The islands remote location in the Sea of Okhotsk north of Japan, the harsh climate and the regions seismic activity combined to make the project challenging for the owner and contractor alike.

Permathene was selected by Chicago Bridge & Iron to manufacture and supply 11,000 m<sup>2</sup> of Dampstop® Reinforced Membrane for laying under the storage tank concrete support pads.

**Note: full case studies for each of these projects are available**

## De-Watering

Tubes, Australia

**I**ncitec Pivot manufactures super phosphate at a plant in Geelong, Australia. A by-product of super phosphate manufacture is formation of silica in fluorosilicic acid ( $H_2SiF_6$ ). The silica and acid, along with any entrained super phosphate dust is captured in the process ponds for storage.

The objective of the project was to separate the solids in the process pond (primarily silica and super phosphate) from the liquid (approx 20% fluorosilicic acid). The solids removed can be recycled back into the product, while the liquid can either be bled back into the process or treated. In order to return the solids back into the process in a timely fashion, the level of moisture content in the solids has to be minimised.

Syntex® High Strength Woven bags were manufactured by Permathene to remove the solids. These bags met the primary requirement of being able to separate the very fine solids from the process liquor, whilst also providing a high solids content cake after only 5-10 days of drying. The heavy individual yarns are woven into a unique twill pattern to form a strong geotextile with superior hydraulic characteristics.

After the drying period (5 days to 3 weeks), the bags were split open and the material picked up using a large frontend loader. The dry product was then returned to the plant for production.

The results were excellent with an estimated 250 tonnes of sludge removed using 14 sludge bags. The sludge removal did not disrupt plant operations.

The cost savings using this method are difficult to quantify, however as per Darren Jarvis Project Engineer, Incitec Pivot have saved an estimated Aus \$100,000 by using this method over other sludge removal techniques.



## Irrigation

Irrigation Canals, New Zealand

**L**ast summer and continuing through the winter Permathene has been on-site installing dozens of irrigation canals primarily from HDPE and FPP (as pictured). In this case we in-house manufactured wide rolls (over 20 m) and completed the job on-site, also installing pipe boots, etc.

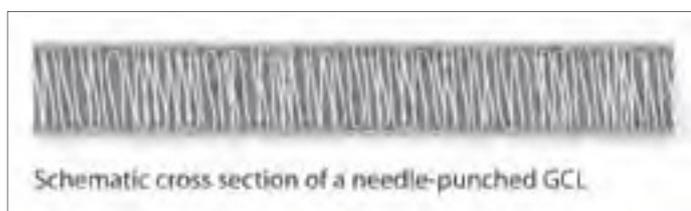


### GCL

Permatene now supplies and installs a new Geosynthetic Clay Liner. Syntex® GCL is a fully needle-punched product comprising highest grade bentonite between two layers of geotextile. The purpose of a GCL is to swell when hydrated to form a hydraulic barrier equivalent to approximately 700 mm of compacted clay.

The advantage of using a fully needle punched GCL is that the bentonite is held in place over slopes by the needle-punched fibres. Uniform distribution of the bentonite is maintained throughout.

Applications include landfill base liner, caps and closures, liquid containment, secondary lining, irrigation canals and lagoons, etc.



### High Strength Woven Geotextiles

We have a new range of PET high strength fabrics which range from 40 kN to 1250 kN.

### Geogrids and Geocomposites

A new range of PVC coated PET geogrids is now offered to complement our already established E'GRID® (HDPE and PP). These grids are available from 20 kN to 200 kN strengths.

These fabrics and grids are made in Europe and carry the CE Mark and are manufactured to ISO 9001.

### Bodkins

We now have available the E'GRID® Bodkin's which are used to connect E'GRID® uni-axial geogrids.