

The South African Chapter of the International Geosynthetics Society

Dedicated to the Scientific and Engineering Development of Geosynthetics and Associated Technologies

A newsletter of the Geosynthetics Interest Group of South Africa
In Association with the South African Institution of Civil Engineering

November 2001

Where people or company or product names are [highlighted](#), these are Internet links in the electronic version of this newsletter.

My, how time flies when you're enjoying yourself . . . the December holidays are here again . . . (Ed.)

President's Comment

Dear friends and colleagues,

Another interesting year is ending (remember that *Chinese Curse*?) The frequent shoulder rubbing and occasional head bumping in the market place and in our GIGSA committee* has perhaps been a fair reflection of the state of the economy and perceptions abounding in the geosynthetic field of interest.

As for me, this December promises to be a time of reflection, with the purpose of galvanising GIGSA activities in 2002. Keen interest has been shown in participating in committee activities, by a broad spectrum of dynamic young professionals who have been invited onto your committee to bring a different perspective to the New Year's events initiative.

Perceptions regarding fairness of play, competence and product performance will be more readily be addressed and future newsletters should be of rather interesting, as they bring factual information to the reader.

In closing, I would like to thank the GIGSA committee and our membership in general for the support shown to me in this year, and take this opportunity to wish you a joyous and *safe* festive season, in which your good wishes for friends and family are manifested on you in turn.

Sincerely,

[Kelvin R. Legge](#)

* (see the *President's Comment* in the July edition of this newsletter – Ed.)

Leach Pad Liner Installed at Yatela Gold Mine in Mali

Engineered Linings has completed a contract for the installation of a HDPE liner to leach pads, channels and solution containment ponds at the new Yatela mine in Mali, West Africa.

The lining section of the project involved approximately 420,000m² of 1,5mm thick HDPE lining, 110 000m² bidim U44 geotextile, 36 000m² Geonet and 30 000m² of lighter U24 and U12.

The mine is jointly owned by Lamgold (40%), the Government of Mali (20%), AngloGold (40%) and is operated by AngloGold Mali SA. Civil contracting was the overall responsibility of MAED (also of South Africa) and Engineered Linings carried out their work as sub-contractors to MAED. Knight Piesold Consulting London were responsible for the design and project management of the heap leach pad.

HDPE geomembrane conforming to the GRI-GM13 standard was used and Kaytech Engineered Fabrics supplied the geotextiles and geonet. All areas were lined with 1,5mm thick HDPE sheeting, mainly smooth, but in certain pedestrian traffic areas, a friction-enhanced liner was used. The pregnant solution, intermediate and barren ponds were all fitted with a double lining system (2 x 1,5mm thick HDPE separated by geonet and geotextile), incorporating a leakage detection zone. The excess solution pond only required a single 1,5mm thick liner.



Aerial view of the Yatela site.

Heap leach stacking commenced early in March 2001 and the first 22,8 kg of gold was poured on 9 May.

Peter Hardie, the Marketing Manager of Engineered Linings, commented: "Living and working conditions were tough, as contractors were housed in a large tent camp with little luxury!"

"During the period our teams were on site, the weather was reasonably kind, in that only one-day delay was caused by rain. Unfortunately this exposed them to the full discomfort of the Hamatan, a dry, dust-laden wind that blows off the Sahara Desert – making life very uncomfortable for the workers who had to resort to wearing masks. It also caused premature wear of machinery, by finding its way into bearings and other moving parts and acting as a grinding paste!"

Hardie says that in spite of the difficult conditions on site, the project ran very smoothly. Language differences were taken care of by the provision of translators and a lot of sign language between the locals and the visitors. The three languages used were French, English and Bambara – the language spoken by the local labour who were employed to assist in the liner installation.

Mali is not virgin territory to Engineered Linings. 1996 saw them complete a contract to line the raw water dams at the nearby Sadiola Mine, also an Anglo Gold Mali SA project. A recent inspection of this installation showed the original liner to be in excellent condition.

For further information regarding heap leach applications, contact Engineered Linings (Pty) Ltd at CPT - (021) 551 2430 or JHB - (011) 974 1397

E-mail peterh@englining.co.za

ct@englining.co.za

jhb@englining.co.za

Web site <http://www.engineered-linings.co.za/>

International Symposium

IS Nuremberg 2002



April 16-17, 2002 ♦ Nuremberg ♦ Germany

The aims of this International Symposium on **Clay Geosynthetic Barriers** organised by the LGA, Nuremberg (Germany) and the Geosynthetics Institute, Folsom PA (USA), under the auspices of the International Geosynthetics Society (IGS), are to offer an opportunity for exchanges on a high scientific and technical level between experts in the various disciplines related to **Clay Geosynthetic Barriers**.

The symposium will appeal to all participants in the geosynthetics field, whether in a practical or scientific sense.

Clay Geosynthetic Barriers are also known as Geosynthetic Clay Liners (GCLs). They are geocomposites consisting of geotextiles and/or geomembranes and Bentonite, a processed natural clay, which hydrates and swells as moisture is encountered, forming a barrier component.

The conference will be the ideal occasion to obtain an overview of the multiple applications of **Clay Geosynthetic Barriers** in all fields of use.

The subjects discussed will be as follows:

- ♦ Applications in civil engineering, hydraulic structures (dams, canals, reservoirs, roads, railways, tunnels), environmental protection, solid waste landfills, transportation systems, effluent and retention basins, protection of water resources, etc.

- ♦ Long-term durability (shear behaviour, desiccation, fibre strength)

- ♦ Test methods (standardisation, laboratory tests, field tests)

- ♦ Clay mineralogy (cation exchange, swelling behaviour)

- ♦ Recommendations (requirements, design, specification, assessment, certification)

- ♦ Research needs and directions

Four special keynote lectures and papers resulting from this call will be orally presented and will form the written proceedings of the symposium. The official language of the symposium will be English.

Eight years after the first International Symposium on Geosynthetic Clay Liners in Nuremberg 1994, the Organising Committee has opted for this event to occur again in Nuremberg, a historical German city in Bavaria.

Nuremberg has an international airport with direct flights to many European cities and has numerous hotels of all categories. The symposium will be held in the *Heilig-Geist-Spital* centre, located in the centre of the old town.

For more information, contact Peter Davies locally, at: -

- ♦ Tel: 011 452 5310

- ♦ Fax: 011 452 1983

- ♦ Mobile 083 252 8206

- ♦ ktechpld@kaymac.co.za

Or, click on the LGA logo to go to the symposium website

New Drainage Media Approved By DWAF

Aquatan's new Hi-Drain drainage media has been accepted by DWAF. This innovative new product has been installed on a variety of projects, and specifically on the following two completed contracts:

♦ Platkop Waste Disposal Facility - Heidelberg

At the Pollution Control Dam, 13 600 m² of Hi-Drain 500 was laid on top of the 1000 µm Hi-Driline secondary liner as a leakage detection layer. The Hi-Drain was then overlaid with a 1500 µm Hi-Driline primary liner.

♦ Dilokong Smelter Plant – Pyromet Ltd

At the Slurry Disposal Dam, a multiple leakage detection system was installed as follows :

- (i) A 1000 μ m Hi-Driline secondary liner was laid on the compacted substrate.
- (ii) An inverted Hi-Drain 500 was then installed over the secondary liner together with leakage detection drainage pipes.
- (iii) A Bentomat ST Geosynthetic Clay Liner was then installed over the inverted Hi-Drain. This combination of GCL and Hi-Drain in itself provides a relatively impermeable layer.
- (iv) A 1500 μ m Hi-Driline Primary Liner was then installed over the GCL.

When commissioned, no seepage or leakage was or has since been detected in the drainage sumps.



Hi-drain Installation at Platkop

The Hi-Drain core is a durable heat formed multiple cusped synthetic sheet which is capable of withstanding a 55 m water head using a 500 μ m thick HDPE base material, or a 90 m water head using a 750 μ m thick HDPE base material. Hi-Drain has also been used in a variety of other applications.

For specifications, details of all SABS testing and additional information, please contact Aquatan Lining Systems at (011) 974 5271 or visit our website at www.aquatan.co.za.

GIGSA Awards - Reminder

Last year GIGSA introduced and implemented a series of awards to give recognition to people and or companies in the geosynthetic industry. The award categories are:

- ◆ Developments in technology
- ◆ Construction
- ◆ Outstanding Service

Further rewards are anticipated for excellence. Nominations will be called for in the latter part of 2002 for any projects or people that may qualify for these awards.

For further information contact:

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Holfontein Encapsulation Silos – Site Visit

A site visit to Enviroserv's Holfontein Landfill Site was held on 6 November 2001. More than 40 people, ranging from structural to waste engineers, as well as national, provincial, and local authorities, attended the site visit.

Waste in hazard group 1, which cannot be treated and is not biodegradable has to be encapsulated. Enviroserv's existing encapsulation area was running out of capacity and a new area had to be developed. The consultant, Jones and Wagner, was requested to investigate alternatives that would result in an improvement in economics, operation and containment.

The old encapsulation method required the drums to be cast in cells with reinforcing around the drums with a minimum cover and distance between drums of 150mm. Formwork would then be erected around the drums and concrete, from a commercial source, would be cast.

The new method consists of a continuously slid concrete water retaining designed silo. The diameter of the silo is 18m and the height approximately 11.5m. Extensive use was made of geosynthetics for the lining of the containment system. The liner system is as follows:

Primary Floor Liner (within silo)

100mm protection Screed
Geotextile Protection Layer
2.0mm HDPE (GRI – GM13 Specification Compliant)
200mm Reinforced Concrete with a minimum strength of 45 MPa

Wall Liner

300mm Reinforced Concrete wall with a minimum strength of 45 MPa
2.0mm HDPE (GRI – GM13 Specification)
Temporary soft board protection layer (removed before casting successive layers of drums)

Leak Detection System (within silo)

100mm No-fines Concrete
Geotextile Protection Layer

Secondary Liner (silo terrace)

1.0mm LLDPE (GRI – GM17 Specification Compliant)
4 No. 150mm thick CCL (Compacted Clay Liner)

Tertiary Liner (Bunded Area)

2.0mm HDPE (GRI – GM13 Specification)
2 No. 150mm thick CCL
150mm Base Preparation

The silos are filled in 3 segments per lifter layer of drums to allow for completion of a single pour without cold joints. There

are a total of 11 lifts in a silo. The new system fulfils all the set objectives of improved economics, operation and containment.

The project team consisted of:

- ◆ Client: Enviroserv Waste Management
- ◆ Earthworks: Fraser Alexander Construction
- ◆ Geosynthetics: Engineered Linings
- ◆ Concrete: Conform Construction
- ◆ Electrical: LK Electrical

For further information contact:

Jonathan Shamrock
Jones & Wagener
Tel 011 803 1455

GIGSA thanks Jonathan for making the professional presentation which preceded the tour, and Jones and Wagner for sponsoring the event, including refreshments.

Geomembrane Specification

During WasteCon 2000, which was held in Somerset West in September 2000, GIGSA was tasked with acting on recommendations made at a workshop on geomembrane use in landfills.

The first recommendation was that the Minimum Requirements for Waste Disposal by Landfill should be amended to specify not only the minimum FML thickness but amended to include that the geomembrane shall comply with the Geosynthetic Research Institute GRI-GM13 and the GRI-GM17 standards for HDPE and LDPE respectively.

Comment was invited from the industry in the July 2001 newsletter on including the above specification in the *Minimum Requirements*.

No objections and only supporting comment was received from over 3 000 people contacted. GIGSA President, Kelvin Legge, has accordingly made a recommendation to the Department of Water Affairs and Forestry that the above proposal be accepted.

The Department now urges compliance and will consider inclusion of these requirements in the next edition, scheduled for 2002.

For more information, contact: -

[Kelvin R. Legge](#)

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International Symposium

Wastecon 2002

The IWM Wastecon 2002 Congress will take place at the International Convention Centre (ICC), in Durban, KwaZulu-Natal, South Africa.

30th September to 4th October 2002.

Theme: **The African Waste Renaissance**

Topics:



- ◆ Waste Handling and Transport
 - ◆ Environmental Legislation
 - ◆ Waste Technology
 - ◆ Community Participation
 - ◆ Waste Minimisation
 - ◆ Bio hazardous Waste
- Call for papers

Papers or posters are invited for presentation at the Congress, on the above or related topics.

Detailed abstracts of the proposed contributions, of not more than one A4 - page typed in single spacing (approximately 300 words), must reach the Programme Organisers before 1st December 2001.

Successful Contributors will be informed by 14th January 2002. Papers (not exceeding twelve pages) must be submitted not later than 13th May 2002 in accordance with a prescribed format, which will be supplied with the notice of acceptance. A brief C.V. must be attached to the abstract when it is submitted for consideration.

Correspondence and enquiries

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Website: <http://www.iwmsa.co.za/>

International Symposium

The IGS 7th International Conference On Geosynthetics, Nice, France

22-27 September 2002



This is *it* folks – *The* conference on geosynthetics, held by the IGS, quadrennially.

For more information, contact Peter Davies at: -

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