

Teranap Bituminous Geomembrane

CASE STUDY

Tailings Dam – West Coast Tasmania, Australia

The first project to install the highest grade of BGM - Teranap 631 TP

The long term mining plan included construction of a new tailings dam in the existing operational site. The scope of works involves construction of a watertight tailings storage dam and civil earthworks such as foundation grouting and a spillway. The associated works included diversion drains and dams, access roads, instrumentation and the decommissioning of the existing decant structure of the main dam.



The new TSF2 will service the existing tailings retreatment project. The new dam will also provide for additional tailings storage for the emptied TSF1 dam for a potential re-opening of the underground mining operations, where significant high-grade mineralisation still exists.

The construction of the TSF2 began in Q4 of 2020 with Hall Earthmoving building slopes to 3:1 and compacting to specification requirements.

Tailings deposition into the new TSF2 is scheduled to start around the end of Q1 2021 so the installation of the BGM had to be well planned and executed within a tight time schedule. This was achieved by the H2O Enviro team led by Michael Sewell.

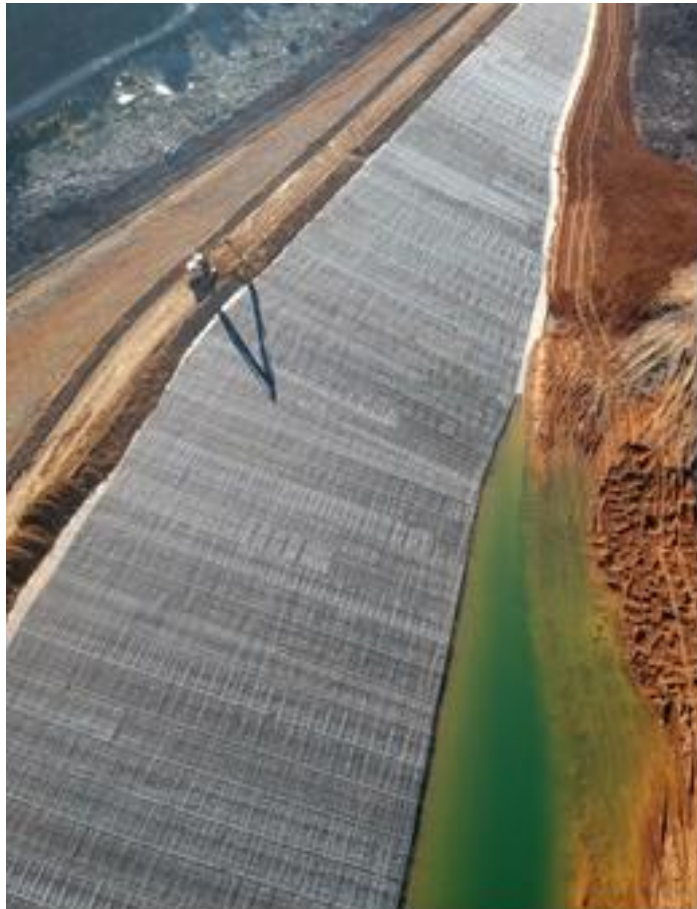
This stage comprises both the earthworks of the first lift as well as the foundations and water management infrastructure for the fully completed dam.



The design calls for a heavy duty Bituminous Geomembrane lining solution. The Siplast Teranap 631 TP was chosen due to its performance for highest grade and thickest of BGM lining systems. The continual thickness and smooth surface allows for firstly continuous weighted control throughout the m² and secondly welded control of two smooth surfaces fully welded to each other encapsulating and blending as one component.

The specification called for the BGM to be tested by a third party NATA Accredited Geosynthetics Laboratory. This was to ensure that the BGM would conform to the specified requirements.

Third party testing results as follows: The TDS reference is Teranap Technical Data Sheet. Specification requirement is also referenced. TPR* means Third Party Results testing exceeded the TDS)



Third party test results

Thickness (ASTM D 5199)

TPR* results 5.88mm (thickest 6.5mm). Specification requirement is 5.6mm.

Density (ASTM D 792, Method A) corrected to 23⁰C (g/cm³) - < 40 hours conditioning.

Density²³C (g/cm³). TPR results 1.026. STD. DEV. 0.010

Specific Gravity 23/23⁰C. TPR results 1.029

Tensile Tear Strength (ASTM D 4073) - 72 hours conditioning.

TPR* results - MD 1286 N & TD 1114 N. Specification requirement is MD 1225 N – TD 1025 N. 631TP TDS is MD 1240 N and TD 1090 N

Puncture Strength (ASTM D 4833)¹. TPR* results – 737 N (highest 828 N). Specification requirement is 650 N. 631TP TDS is 700

Tensile Properties (ASTM D 7275 - 50mm/min) MD is Machine Direction and TD is Transverse Direction.

Maximum Strength MD (kN/m). TPR results STD. DEV. 36 (max 40.3). 631TP TDS is 36

Maximum Strength TD (kN/m). TPR results STD. DEV. 30 (max 34.8). 631TP TDS is 29

Elongation @ max. MD (%). TPR* results AVG. 113 (max 119). 631TP TDS is 83

Elongation @ max. TD (%). TPR* results AVG. 112 (max 125). 631TP TDS is 85



This in combination with Geotas Pty Ltd based in Tasmania and with a proven successful business model for service, quality and reliability in the civil industry is the solution.

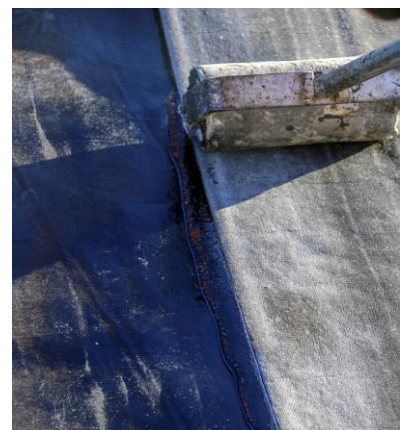
Earth works carried out by Hall Earthmoving began in May 2020 and entailed site clearing, excavation to bedrock for a concrete plinth at the dam toe, drilling and bentonite sealing, and dam wall construction.

Shortly after setting of the slopes and the compaction to the specification requirements H2O Enviro began to deploy and install the Teranap 631 TP. Installation was achieved by a team of professional torch hands and assistants.

Frequent rain events had the potential to cause delays with damage to the finely prepared sub-grade, so a large tarpaulin was deployed to protect the surface to be lined from wash-out. This saved time, and considerable costs for re-work of the surface.



The base of the lining system was terminated onto a concrete plinth, which was primed with SIPLAST PRIMER, to which the liner was then welded. Following torch welding onto the concrete a stainless steel batten bar was installed over the Teranap and fastened down with stainless steel tru bolts.



Geotas, H2O Enviro and the Siplast Teranap area manager attended site in the finishing stages to view the BGM installation process and to answer any questions raised by the mine and the specifying engineers.

The mine produces the following mineral resources:

- Zinc
- Lead
- Silver
- Gold

Main Contractor: Hall Earth Moving

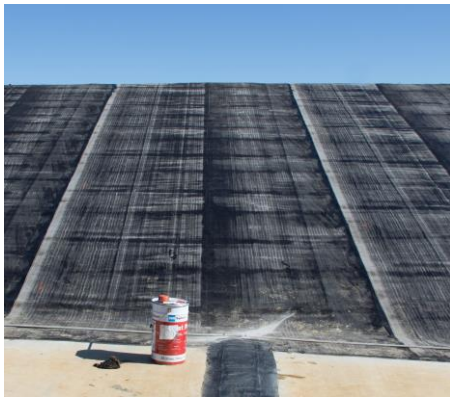
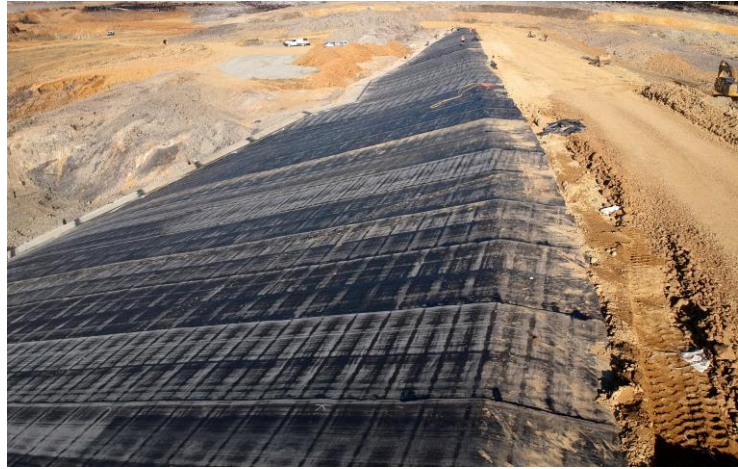
BGM Contractor: H2O Enviro

Project: West Coast Tasmania

Specifying Engineers: GHD

BGM Supplier: Geotas Pty Ltd

BGM Product: TERANAP 631 TP



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