

HILLSIDE MINE COMMUNITY VOICE

HILLSIDE PEPR – SOIL AND LANDFORM MANAGEMENT PLAN



14 JULY 2017



The objective of this Plan is to provide the framework for:

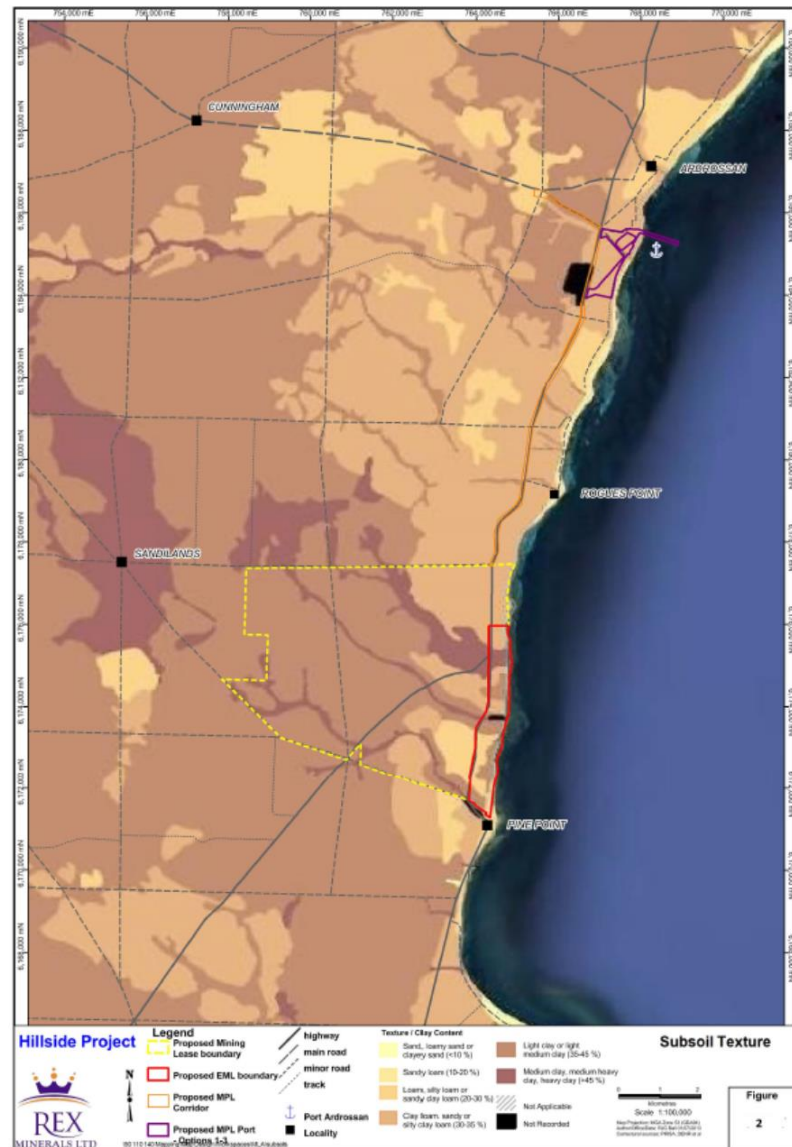
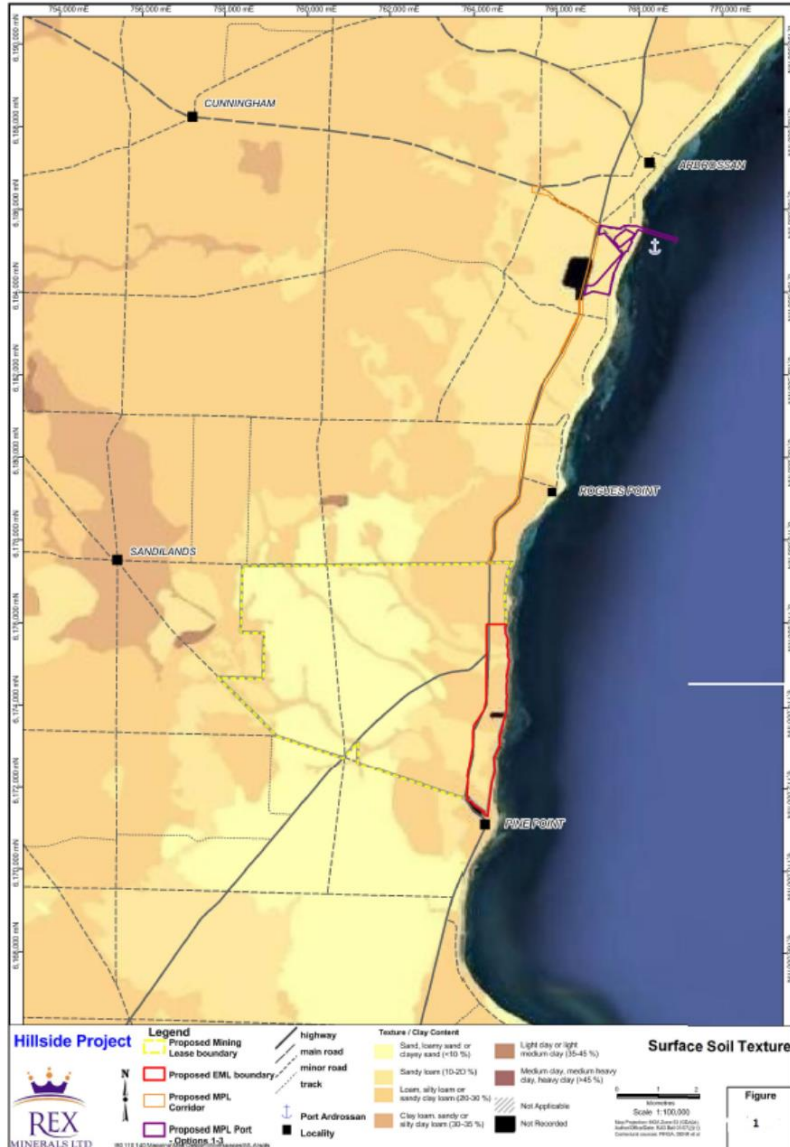
- ensuring compliance with all relevant statutory requirements;
- Rex Minerals Policies and Standards;
- managing and mitigating the potential impacts to soil and land management;
- protect agricultural cropping land from soil erosion;
- improve the condition of pasture and cropping land;
- locate topsoil stockpile to minimise erosion, encourage vegetation cover and avoid water ponding;
- direct the placement and spreading of topsoil with due care regarding depth, to meet rehabilitation requirements;
- suppress loss of soil through the suppression of dust and prevention of erosion; and
- maintain a current inventory of topsoil and subsoil and a record of all movements.



- Rex undertook overburden (topsoil and subsoil) characterisation studies as part of MLP in 2011.
- These baseline soil maps established a baseline dataset of the pre-mining condition of soils topsoil and subsoil – refer Figures 1 and 2 below.
- Soils that were identified with suitable characteristics for rehabilitation and construction applications will be separated from the other overburden.
- The baseline soil studies will be supplemented by additional pre-stripping soil surveys, conducted by a trained site soil specialist, just prior to construction.

SOIL AND LANDFORM MANAGEMENT PLAN

SOIL AND SUB-SOIL BASELINE – FIGURES 1 AND 2





The topsoil is generally alkaline, mildly saline with low fertility - phosphorus mostly below 0.2mg/kg - nitrates below 5mg/kg.

Soils are more saline and sodic with depth below surface, and generally more acidic with depth.

Topsoil depth varies across the site with an average depth of 0.3m. The subsoil is highly variable in depth, with most samples below 2m being classified as very strongly sodic.

A preliminary soil balance identified more than sufficient topsoil and subsoil available for the rehabilitation works as per table below:

	Tonnes
Topsoil stripped (0.3m)	5,992,871
Topsoil required for rehabilitation (0.2 - 0.3m)	4,819,636



- Recovery of topsoil – Soil characterisation and mapping – direct placement or stockpiling – stockpile records maintained (refer Appendix 3 of management plan for soil stockpile locations at various years)
- Scheduling of soil stripping: to coincide with mine schedule – vegetation clearance, protection of organic material and moisture – strip and place soil in layers and by type
- Management of stockpiles: dust and erosion control cover – drainage and bunding (if required)
- Reinstatement of soil: transfer and place soil on final landforms – and revegetate in line with closure plan (refer Appendix 1 of management plan for progressive rehabilitation diagrams)
- Record of soil movement: record of soil by volume, type and location – reconcile soil volumes and audit
- Determine soil amelioration requirements from soil survey and apply during placement



The key objectives of the soil and land management monitoring program will:

- Demonstrate that soil quantity and quality is maintained and tracked throughout mine life.
- Demonstrate that site disturbance will be confined to the planned mine footprint and not impact soil and land outside the tenement boundaries.
- Monitor progress of rehabilitation in returning disturbed land to the pre-mine use; pasture, crops, or native vegetation.
- Design and implement a leading practice rehabilitation monitoring program to track progress on the rehabilitation mine closure criteria, within one year of commencing work.



The outcomes of the soil and land management monitoring program will:

- Be integrated into whole-of-life mine planning to ensure timely and cost-effective solutions to facilitate sustainable mine closure.
- Include carefully selected monitoring indicators or parameters to enable useful long-term monitoring and evaluation of the response to mine rehabilitation.
- Inform adaptive rehabilitation management.
- Progressively generate data on the selected indicators or parameters through the life of the mine.
- Generate data over the mine life to inform on the performance of control measures on soil stripping, stockpile management and site rehabilitation.
- Build confidence in the achievement of the Hillside Mine completion criteria.

Monitoring will document the following soil and landform activities:

- site preparation (eg. deep ripping, rock armouring, application of gypsum);
- the use of topsoil (including sources, handling, storage length);
- fertiliser types, application rates and history;
- seeding including the composition of seed, rates, and application method;
- the density of species planted; and
- the occurrence of disturbances such as storm events (gales or flooding) and fires.

The data collected will consist of:

- Biotic variables such as species composition, diversity, and abundance.
- Abiotic information such as rainfall, temperature, wind speed, site run-off, groundwater level and quality, erosion rills, sedimentation, water infiltration.



The monitoring sites will include:

- Reference (or analogue) sites on unmined land that rehabilitation is trying to emulate. These will be used to cross-check how site rehabilitation is performing and factor in responses to seasonal conditions.
- Impact sites, are mine disturbed and rehabilitated areas that will represent various mine completion targets, including restored agricultural land and native vegetation.

Frequency of monitoring:

- Baseline and continuing monitoring of both reference and impact sites to provide comparisons in benchmarking or quality control.
- Initial establishment monitoring, to be undertaken within 12 months after completion of rehabilitation.
- Long-term monitoring beginning two to three years after initial establishment to evaluate trends and if those trends are likely to deliver a sustainable ecosystem.



Rex Minerals will report on the performance of the SLMP in the ACR and may include details on the following:

- Total soil stripped for the reporting period.
- Total soil stockpiled on site, including amelioration treatments to these stockpiles.
- Photo monitoring reports of stockpiles.
- Total soil used in rehabilitation for the reporting period and the effectiveness of the rehabilitation.

The ACR will also report of the effectiveness of the soil stripping methods employed and the performance of the soil management activities in meeting the soil and land management objectives. This will include key milestones or results of rehabilitation trials. Significant outcomes will be reported to the wider community through the Rex Minerals Newsletter and the HMCV.



STAY IN TOUCH

Website: www.rexminerals.com.au

Email: community@rexminerals.com.au

A: PO Box 3435 Rundle Mall SA 5000

T: +61 (0) 8 82997100

E: rex@rexminerals.com.au