VHM Limited

MINE SITE SURFACE WATER IMPACT ASSESSMENT STUDY

Goschen Rare Earths and Mineral Sands Project

What the impact assessment study found

This study focuses on stormwater impacts within the operational mine area which include undisturbed catchments, construction areas, active mine/tailings deposition, process plant, site stockpiles, and rehabilitation areas.

Water quality can be managed through standard surface water management controls and monitoring program without impact to external receptors.

Surface water management strategy

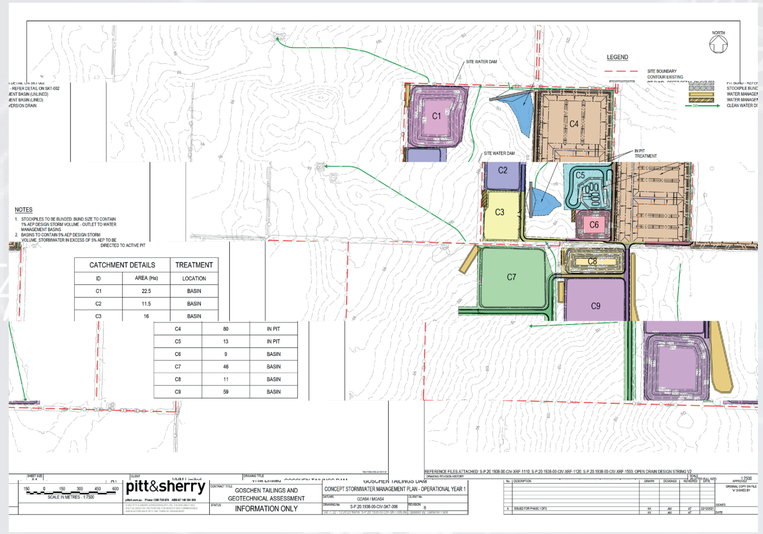
- Water that has had contact with mining and processing on site will not leave the site boundary – it will be harvested and used in the mining process
- Open pits will be utilised as storage capacity for mine affected water with capacity for greater than 1 in 20 year storm events (with capacity to hold up to 1 in 100 year storm events)
- All available surface water will be captured and utilised to reduce likelihood and potential impact of increased water quantity flows from site – site water containment structures will be designed to hold up to 1 in 20 year storm events
- Catchment adjustment will be implemented to direct clear water around active areas to reduce water loss from external streams
- Maintain the very low erosion hazard site characteristics (low rainfall and flat topography) and supplement with best practice erosion and sediment controls and early establishment and ongoing maintenance of vegetation

Mitigation, monitoring and contingency measures

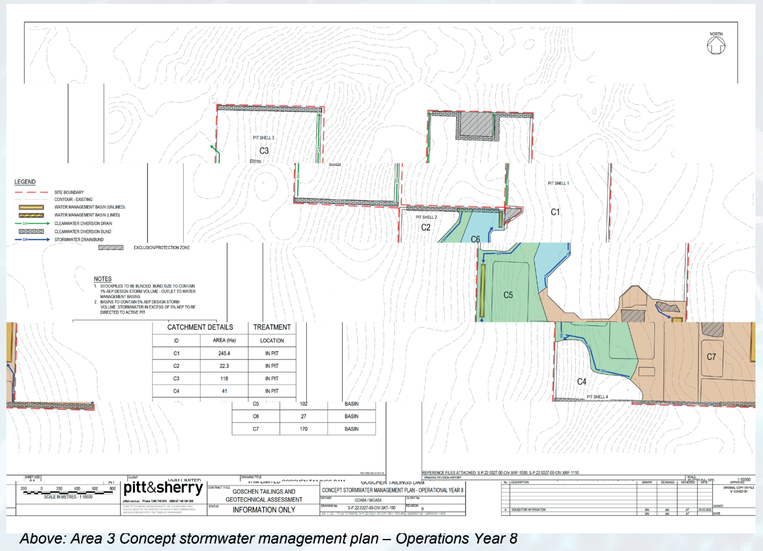
- Development and implementation of Construction and Operational Management Plans. Each plan is to be updated during the life of the project to reflect changes to site layout and risk profile, and include:
  - Spill containment and treatment measures
  - Environmental Management Plan (EMP)
  - Surface Water Monitoring and Management Plan (SWMP)
  - Groundwater Monitoring and Management Plan (GWMP)
  - Erosion and Sediment Control Plan (ESCP)
- Monitor and test surface water prior to implementing discharge plans to ensure performance outcomes can be achieved
- Investigate and assess pre-mine development water quality and adjust water quality objectives and indicators updated to reflect baseline conditions
- Incorporate rehabilitation into the ongoing mine operation to minimise disturbance footprint and return affected mine areas to a safe, stable and sustainable landform capable of supporting land uses currently operating on adjacent lands
- Use best practice guidelines in developing and implementing erosion and sediment control plans
- Allow for irrigation of vegetated areas on site to maintain vegetation coverage
- Locate water management basins at the bottom of disturbed catchments to capture all surface water run-off within disturbed areas
- Line water management basins that have reasonable potential for contaminated water to be present with impervious liner
- Allow surface water run-off from undisturbed and rehabilitated areas than can meet the required water quality objectives to be directed to the natural drainage systems to mitigate the quantity of water removed from the external catchments
- Design stockpiles to reduce run-off concentration and velocity and be protected by vegetated bunds that direct surface water to a water management basin
- Maintain the mine pit floor well above the groundwater table to reduce the potential for surface water and groundwater interaction.

Conclusion

- Harvesting of water from within the mine site for use in process reduces the likelihood and impact of increased water quantity flow (such as flooding) offsite
- Diversion of clean water offsite mitigates the impact of reduced water quantity flow offsite
- There is a very low risk of erosion hazard and very low risk of sediment transport in surface water due to the low rainfall and flat topography. Water quality impacts can be mitigated through
  - minimisation of active mining areas
  - revegetation of disturbed areas and maintenance of existing vegetation
  - implementation of best practice erosion and sediment controls.



Above: Area 1 Concept stormwater management plan – Operations Year 1



Above: Area 3 Concept stormwater management plan – Operations Year 8