




VHM Limited

Environment Effects Statement

**Goschen Rare Earths and
Mineral Sands Project
Summary**



This document provides an overview of the Goschen Rare Earths and Mineral Sands Project Environment Effects Statement (**EES**).

It includes:

- a non-technical summary of the Project
- an outline of the EES process
- explanation on how to navigate the EES
- information on the public exhibition process
- explanation on how to make a written submission.

For detailed technical information on the Project, please refer to the EES chapters and technical reports available at www.vhmltd.com.au/ees/.

VHM acknowledges the traditional custodians of the land in which we live, and pays its respects to their elders, past and present.

The Wemba Wamba peoples are the original custodians of the land on which the Project is located, and we also acknowledge the Latji Latji, Tatti Tatti, Wadi Wadi and Barapa Barapa peoples as the original custodians of the surrounding area within which we work.

VHM accepts that spellings of community and places may vary.

We are committed to Aboriginal engagement and reconciliation and aim to bring Aboriginal and Torres Strait Islander people, local communities and the councils along for the journey to strengthen relationships and enhance local community outcomes.

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1. Goschen Rare Earths and Mineral Sands Project

VHM Limited (VHM) is proposing to develop the Goschen Rare Earths and Mineral Sands Project (the Project) in the Loddon Mallee Region of Victoria, approximately 35 kilometres south of Swan Hill in the Gannawarra Shire Council. The Project would involve the mining and processing of heavy mineral sands and rare earth minerals.

The Project area contains ore which is proposed to produce a range of products including mixed heavy mineral concentrate (HMC), zircon concentrate, rutile, leucoxene, ilmenite, as well as rare earth mineral products. The Project would involve mining within two defined mining areas and processing of heavy mineral sands at a throughput of approximately 5 Million tonnes per annum (Mtpa) over an estimated 20 to 25 year mine life. Mine products are proposed to be transported in 20 foot sealed sea containers via road during the day to an intermodal at Ultima and then rail to the Port of Melbourne for export overseas.

1.1 About VHM Limited

VHM Limited (ASX: VHM) is an Australian owned and operated, rare earths and mineral sands mine development company that was established in 2014. VHM has an ongoing exploration and evaluation program in the Loddon Mallee Region to identify new mining opportunities as required under its exploration licences.

VHM is a responsible company which recognises and respects the environment and the values and rights of others in the region. VHM acknowledges that a change in activities can have environmental impact, so the Project has been designed to avoid, minimise and manage these impacts as far as reasonably practicable. VHM will comply with all applicable environmental obligations and recognises that environmental performance is an important factor in its business performance and is a measure of professionalism. VHM commits to continually improving its environmental performance and responsibility through the education of its employees and contractors.

1.2 Project description

VHM proposes to develop, one of the world's largest, highest-grade rare earths, zircon and rutile deposits, located near Lalbert in the Murray Basin, Victoria. The Project would involve the mining and processing of rare earths and heavy mineral sands extracted from two areas, one to the south (also referred to as Area 1) and the other 1.4 kilometres to the north (referred to as Area 3), covering an area of approximately 1,534 hectares. Area 1 and Area 3 would be connected via a services corridor (less than three hectares) within Shepherd Road. Area 1 is to be developed first, followed by Area 3.

VHM would develop the Project's processing of ore in phases:

Phase 1 would involve a mining unit plant (MUP), wet concentrator plant (WCP), feed preparation plant (FPP) and a rare earth mineral concentrate (REMC) flotation plant. The product suite for Phase 1 consists of zircon-titania heavy mineral concentrate (HMC) and REMC products.

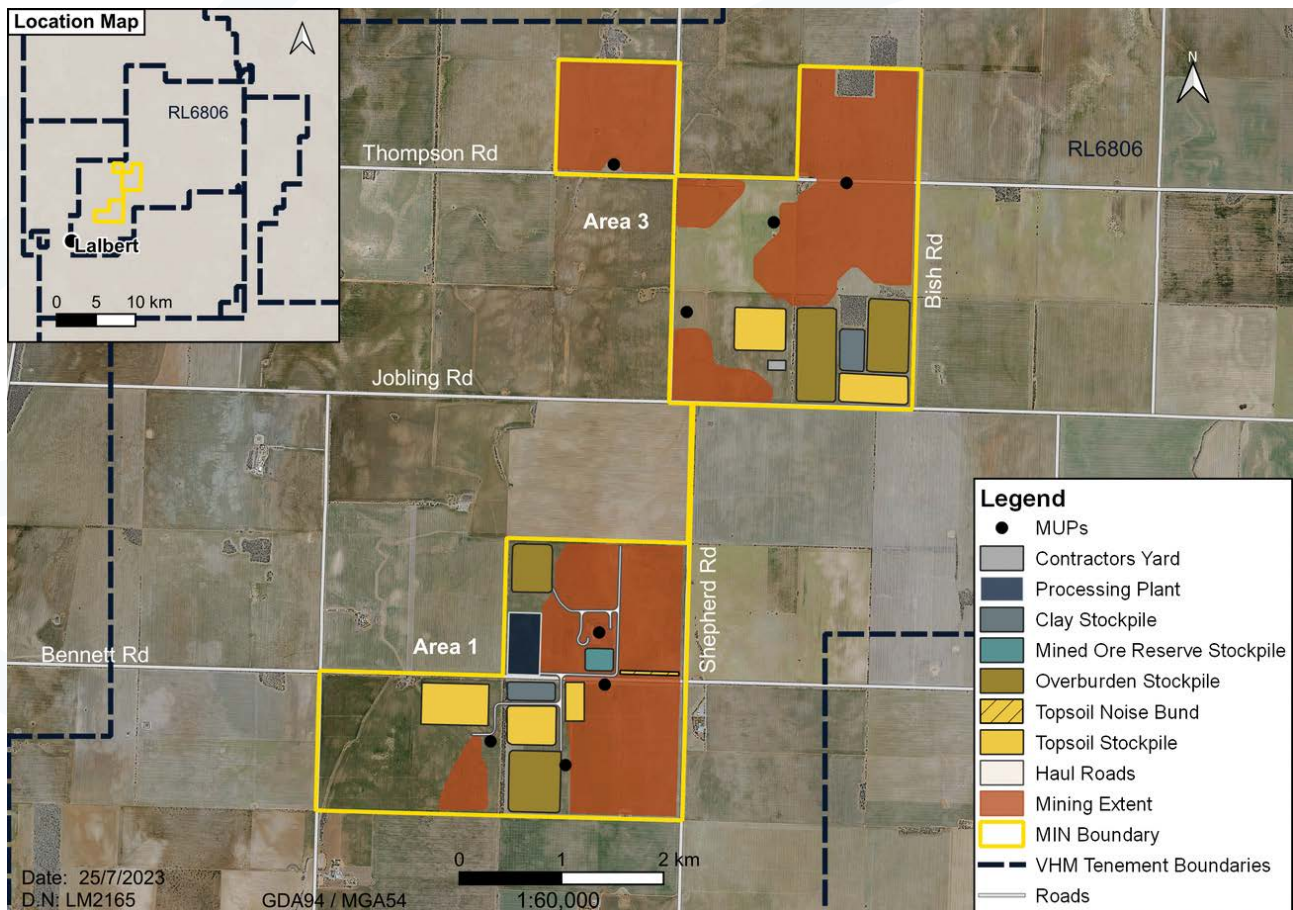
Phase 1A would add a hydrometallurgical circuit downstream of the REMC flotation plant, within six to 12 months of first production from Phase 1. The product suite for Phase 1A consists of mixed rare earth carbonate (MREC) products and zircon/titania HMC.

Phase 2 would commence within 24 months post-production, depending on prevailing market circumstances, and consist of an additional mineral separation plant (MSP), hot acid leach (HAL) and chrome removal circuit. The additional plant would allow for the production of premium zircon, zircon concentrate, high titanium (HiTi) rutile, HiTi leucoxene and low chromium ilmenite.

Conventional open pit mining equipment would be used for a mining operation with all activities above the regional water table. Mining blocks would be approximately 200 metres long and variable in width (~500 metres) to suit prevailing ground conditions. Excavators would be used to move and stockpile overburden and to mine the ore, and trucks would transport the ore to the MUP, where the ore would be prepared for processing. Primary mining operations would be supported by dozers and front-end loaders, which would be used for activities such as cross-ripping, pushing up bunds and contouring waste dumps.

Mining would occur in blocks, with excavation, tailings deposition and rehabilitation being undertaken in a progressive sequence. It is expected that each mining block would be mined and rehabilitated within a time period of approximately two to three years.

Figure 1: Proposed layout of Area 1 and Area 3





At the beginning of mining operations, overburden and ore extracted from the first mining block would be stored at the surface in stockpiles. Once the first block has been mined, overburden stockpiled at the surface would be used to make tailings bunds within the void of mined blocks. Ore processing would then begin, and homogenised tailings would be deposited into the contained cells located within the mined block. The deposited tailings would then be covered by more overburden as mining progresses to the next block.

The key Project components include:

- **Mining** – mining would operate 24 hours a day at a throughput of 5 Mtpa and would occur above the groundwater table within the proposed Mining Licence (MIN007256) boundary that covers 1,534 hectares of farmland using conventional open cut mining methods of excavation, load and haul.
- **Processing** – the processing plant is located within Area 1 and would operate 24 hours a day with heavy mineral sands and rare earths ore separated via an on-site Wet Concentrator Plant (WCP) and Mineral Separation Plant (MSP) to generate a Rare Earth Mineral Concentrate (REMC). Refining of the REMC on site is limited to hydrometallurgical extraction to produce a mixed rare earth carbonate (MREC). Tailings from the various mineral processes would be homogenised and placed back into the open pits and within ore zone earlier mined. The proposed mining sequence has been designed such that there will be no above ground tailings storage facility outside the mined pits.
- **Rehabilitation** – the mined areas would be progressively backfilled in a staged manner, with tailings dewatered in-pit to allow overburden and topsoil placement in a profile that re-instates the existing soil structure. The goal would be for a return to the current agricultural land uses within three years.
- **Water** – water is required for construction earthworks, processing, dust suppression and rehabilitation, and would be sourced from Kangaroo Lake. A maximum of 4.5 Gigalitres per year (GL/y) of water will be needed for the Project, with a steady state during operations of between 2.9 to 3.1 GL/year. The water would be delivered from a new pump station adjacent to Kangaroo Lake and a 38 kilometre underground pipeline to be constructed beneath existing local roads. Water would be purchased through the open water market, which has in excess of 500 GL/y in any year, for delivery by Goulburn Murray Water.
- **Power** – all electrical power needed for mining and processing during operation, requiring a maximum 5 megawatts of power consumption, would be initially produced from an on-site power plant able to be fuelled by diesel, LNG and/or LPG. A gradual evolution within five years to renewables, hydrogen and/or battery will be the goal as technologies and commercial viability increase. Heat energy for the on-site gas fired appliances would be provided from an extension of the distribution network from the main LNG storage on site.
- **Transport** – final products would be containerised in 20 foot sealed sea containers on site and exported via road during the day to an intermodal at Ultima and then rail to the Port of Melbourne.

Further details on the construction and operation of the Project are provided in Chapter 3: Project description.

1.3 Project need

VHM has developed the Project in the context of the Australian Government's 2022 Critical Minerals Strategy and a rapidly growing global demand for rare earth minerals. This is largely driven by the transition to electric vehicles (EVs) and renewable energy in a market demanding geographic diversity of supply of rare earth materials. Ideally positioned at the start of this demand curve, VHM would be able to produce rare earth mineral concentrates through the operation of the Project.

The demand for rare earth minerals is forecast to grow materially over the next decade. The International Energy Agency (IEA) forecasts that as a minimum, the number of EVs on the road will grow from ten million in 2020 to almost 150 million in 2030 (IEA, 2021).

The Project's rare earth and zircon deposit is unique as the mineralisation occurs in sands near the surface. This is unlike many other deposits in Australia which are hosted within hard rock. This translates to significant cost benefits in both the mining and processing operations when compared to other rare earth mineral projects which process large quantities of material through crushing and grinding circuits.

It is expected that China's rare earth production will only moderately increase in the years ahead, and few alternative sources of supply are expected to come on stream; meaning the availability of certain rare earth elements would grow increasingly scarce from 2023 onward¹. It is anticipated that the global rare earth industry will consistently under-produce Neodymium, Praseodymium, Dysprosium and Terbium (or oxide equivalents), resulting in supply shortages of these critical magnet materials if production is not increased beyond levels currently anticipated.



¹ VHM Ltd (2022), Prospectus

Benefits to the Community

The Project is estimated to bring significant economic benefits to both the local community and the state.



\$2.0 billion

in additional Gross Regional Product (GRP) for the Loddon-Mallee region which equates to an average **\$206 million per annum** (Project construction and operation)



\$1.3 billion

in additional Gross State Product (GSP), which equates to **\$126 million per annum**



20% increase

in **mining output** in the Loddon-Mallee Region



More jobs for the Loddon-Mallee Region

- Additional **260 construction jobs** over approximately 2 years and **400+ full time jobs** in operations over approximately 20 years
- For every direct mining job, **two additional jobs** will be generated in supply chains

Source: Deloitte Access Economics Report 2022 (EES Attachment IV: Economic Assessment)

2 Project assessment

2.1 Requirement for an Environment Effects Statement

An Environment Effects Statement (EES) describes a project and its potential environmental effects. The EES process is not an approval in itself, but an assessment by the Minister for Planning (the Minister) as to whether the Project is considered acceptable or otherwise in terms of potential environmental impacts. The EES informs regulatory authorities on whether or not the Project should proceed, and if so, under what conditions.

The *Environment Effects Act 1978* (Vic) (EE Act) establishes a legislative framework to assess the environmental effects of proposed works that are capable of having a significant effect on the environment. The EE Act also enables the Minister to decide that a proponent of works should prepare an Environment Effects Statement.

In light of the potential for significant environmental effects, on 10 October 2018 the Minister determined under the EE Act that an EES is required for the Project. The Minister's reasons for making this decision included 'the potential for a range of significant environmental effects'. In particular, the Project could potentially have significant effects on:

- Native vegetation and associated biodiversity values, including listed threatened species and communities
- Surface water and groundwater and protected beneficial uses
- Existing land uses, amenity and landscape values
- Aboriginal cultural heritage values.

Other matters that required investigation included effects on land stability, erosion and soil productivity (including rehabilitation works), positive and adverse socio-economic effects, waste, traffic and effects of the Project construction workforce on the capacity of local community infrastructure.

The Minister subsequently prepared EES scoping requirements (May 2019) that set out the matters that must be addressed in this EES.

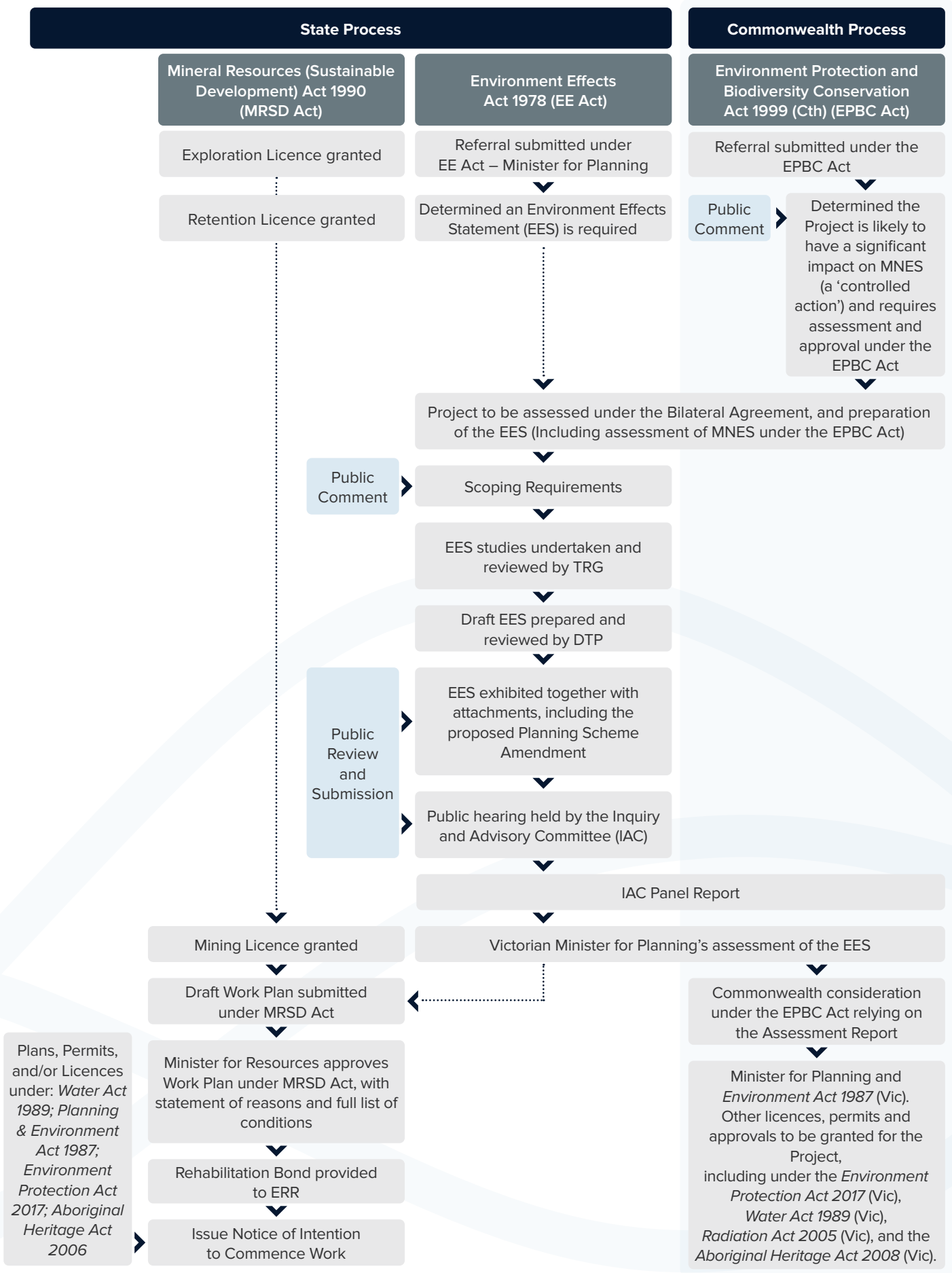
The Project was also referred to the Australian government under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The delegate for the Minister for the Department of the Environment and Energy (now referred to as the Department of Climate Change, Energy, Environment and Water (DCCEEW)) determined on 19 December 2018 that the Project is a 'controlled action' requiring assessment and approval under the EPBC Act. On 30 January 2023, a variation to the original proposal was accepted by the delegate of the Minister for the Environment. The controlling provisions for the Australian government's controlled action decision under the EPBC Act were:

- Ramsar wetlands (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Nuclear actions (sections 21 and 22A)

The EES process is accredited to assess impacts on matters of national environmental significance under the EPBC Act through the Bilateral (Assessment) Agreement between the Commonwealth and the State of Victoria (Figure 2). Therefore, this EES also considers Matters of National Environmental Significance (MNES) for the purposes of assessment of the controlled action under the EPBC Act.

After considering the Victorian Minister for Planning's assessment under the *Environment Effects Act 1978*, the Commonwealth Minister for the Environment will then make a separate decision as to whether to approve the controlled action application for the proposed project under the EPBC Act.

Figure 2: EES Process



2.2 Approach to the EES

This EES presents a holistic and integrated assessment of the Project. It outlines the design, construction methodology, operation, decommissioning, closure, and the specific potential environmental impacts of each of the components of the Project.

The EES main report comprises 23 chapters and is accompanied by 17 technical reports and four attachments.

The structure of the EES is shown in Figure 3.

Figure 3: Structure of this EES



Main EES Volume

The 23 chapters of the Main EES Volume provides both technical and non-technical information to assist the reader in understanding the Project and the regulatory framework (refer to Chapters 1 to 6, and Chapter 23), the environmental impact assessments for various studies (refer to Chapters 7 to 20), and the stakeholder and community engagement undertaken for the project (refer to Chapter 22). The chapters range from approximately 10 to 50 pages in length.

Technical reports

To ensure that all key issues from the scoping requirements were addressed in the EES, 17 technical studies were undertaken. The technical studies assessed the significance of the effects on the physical and ecological systems, and social implications from the Project's construction, operation, decommissioning and closure, supported by field surveys, investigations and baseline monitoring which include, but are not limited to:

- Ecological surveys to assess populations or habitat of indigenous species of flora or fauna of conservation significance, including ecosystem processes supporting biodiversity (refer to Technical Report A: Flora Ecology and Technical Report B: Fauna Ecology, including corresponding Chapter 7)
- Field surveys and examination of ground surfaces, mature trees and historical structures or features in the study area to identify landforms and areas of Aboriginal cultural heritage sensitivity (refer to Technical Report C: Cultural Heritage, including corresponding Chapter 8).
- Noise baseline monitoring around the Project mining area to inform an assessment of the potential significant effects on the amenity resulting from noise (refer to Technical Report F: Noise, including corresponding Chapter 11).
- Ambient air quality monitoring undertaken to assess the potential effects or statutory compliance issues that may arise from the Projects air emissions (refer to Technical Report G: Air Quality, including corresponding Chapter 12)

- A groundwater monitoring program to ensure prompt detection and groundwater effects associated with the Project, including the identification of possible contingency actions to respond to foreseeable changes that may be identified through the monitoring program. Ongoing groundwater monitoring would be undertaken during operation and rehabilitation of the mine to identify any changes to groundwater chemistry in comparison to pre-existing conditions in the Project area (refer to Technical Report I: Groundwater, including corresponding Chapter 14)
- Quantification of the existing radiological environment and the establishment of monitoring locations around the Project's mine site for continuous routine monitoring. The monitoring has determined that the existing radiological environment is consistent with general Australian and world radiological characteristics (refer to Technical Report N: Radiation, including corresponding Chapter 17).

Detailed assessment of the existing conditions and key issues relating to each environmental aspect can be found in the corresponding technical reports.

Attachments

The Attachments include a Draft Work Plan, an application to the Victorian EPA for a Development Licence, a Draft Planning Scheme Amendment to the Swan Hill and Gannawarra Planning Schemes, and an economic assessment of the Project.

2.3 Overview of environmental management

The Environmental Management Framework (EMF) contains the environmental management measures proposed in the EES to address specific issues, including commitments to mitigate adverse effects and enhance environmental outcomes, see Chapter 21: Environmental Management Framework.

The EMF provides a framework to address how environmental effects and risks associated with the Project would be managed, including responsibilities for environmental management, explanation of how the Project would integrate with existing management plans and systems, and monitoring, response and reporting requirements for environmental incidents. The Project will be delivered within the context of the EMF, in accordance with the obligations and requirements of the statutory approvals and consents required for the Project. A range of approvals and consents are required for the Project, including:

- The mining licence and work plan (and associated management plans), which will regulate mining activities on land subject to the mining licence; and
- The Incorporated Document (and the various plans required under it), which will regulate the use and development of land outside the mining licence that is required for supporting infrastructure, including the water pipeline and road upgrade works.

Before the commencement of each Project phase (construction, operation, rehabilitation and closure), it will be the responsibility of VHM to obtain the required statutory approvals and consents, together with any secondary consents required under them (i.e. approval of management plans that are required by conditions of the mining licence or Incorporated Document). VHM will prepare, implement and maintain environment plans and Environment Management Plans for each relevant phase of the Project to meet the requirements of the statutory approvals and consents.

VHM has made various commitments in the EMF regarding the measures it will take to avoid, manage and monitor the potential environmental impacts of the Project.



2.4 Summary of key approvals

A summary of key approvals required for the Project is provided in Table 1 below along with the phase of the Project each approval is required for and the approval authority.

Table 1: Project approvals

Legislation	Statutory approval	Statutory approval authority
Environment Protection and Biodiversity Conservation Act 1999 (Cth)	Approval of the controlled action	Commonwealth Minister for the Environment
Mineral Resources (Sustainable Development) Act 1990	Mining Licence Approved Work Plan	Minister for Energy and Resources Earth Resources Regulator
Environment Protection Act 2017	Development Licence Permits	Minister for Environment EPA
Planning and Environment Act 1987	Planning Scheme Amendment to the Gannawarra Planning Scheme and Swan Hill Planning Scheme (Applying a Specific Controls Overlay with an Incorporated Document)	Minister for Planning
Aboriginal Heritage Act 2006	Cultural Heritage Management Plan	Minister for Treaty and First Peoples

3 Next steps in the EES process

3.1 How to make a submission

Submissions on the EES, Draft Planning Scheme Amendment (PSA) and Environment Protection Authority (EPA) Development Licence application must be made in writing and received by 11.59pm on 17 January 2024.

Each submission will be treated as a submission on the EES and on the other exhibited documents (Draft PSA and EPA Development Licence application). Only one submission is needed to address all of your views about the Project, its effects and the relevant documents. Online submissions are preferred and can be lodged via the Victorian government's engagement website Engage Victoria: engage.vic.gov.au/Goschen-IAC.

Where a submitter is unable to lodge a submission online, they must contact Planning Panels Victoria (PPV) through the DEECA Customer Call Centre on 136 186 (select option 6) and request a hard copy submission coversheet. Each hard copy submission must be accompanied by a completed coversheet issued by PPV for privacy reasons.

All submissions must state the name and address of the person making the submission. Petitions will be treated as a single submission and only the first name from a petition will be registered and contacted. Pro-forma submitters will be registered and contacted individually if they provide their contact details. However, pro-forma submitters who want to be heard at the hearing may be encouraged to present as a group, given their submissions raise the same issues.

Submissions will be treated as public documents and will be published on the Engage Victoria website. This means that your submission and your name will be made public. Submitters are recommended to not include personal information in the body of the submission (such as email addresses, phone numbers or photos of people).

Anyone seeking to be heard at the public hearing is required to submit a written submission and indicate on the online submission form or hard copy submission cover sheet that they would like to be heard at the hearing.

The submission process is independently managed by Planning Panels Victoria. For more information about the submission process, contact Planning Panels Victoria on 136 186 (select option 6) or email planning.panels@delwp.vic.gov.au.

3.2 Inquiry and Advisory Committee process

The Minister for Planning will appoint a joint Inquiry and Advisory Committee (IAC) under the *Environment Effects Act 1978* and the *Planning and Environment Act 1987* to hold an inquiry into the Project and its environmental effects. The independent IAC will review the public submissions, the EES, the Draft PSA and the EPA Development Licence application before providing advice to the Minister for Planning. It will review and consider the environmental effects of the Project in accordance with Terms of Reference issued by the Minister for Planning.

After the exhibition period, the IAC will hold a Directions Hearing on Tuesday 13 February 2024, where the necessary arrangements and timetable for the public hearing will be established.

The public hearing will commence the week beginning Monday 25 March 2024 and run for one to three weeks (based on submissions and confirmed at the Directions Hearing).

Further Information about the Directions Hearing arrangements, hearing process and timetable will be published as it becomes available at engage.vic.gov.au/Goschen-IAC.

The IAC will provide a report to the Minister for Planning who will consider this report to inform the Minister's assessment of the Project's environmental effects. The Minister's assessment of the Project will make recommendations about whether the environmental effects of the Project are acceptable and will inform statutory decision-makers responsible for issuing environmental approvals for the Project.





VHM Limited

**Suite 1 Level 11
330 Collins Street
Melbourne VIC 3000
Australia**

**For Goschen Project EES
enquiries, please contact us:**

**community@vhmltd.com.au
03 5450 8804
www.vhmltd.com.au/contact**

**All EES Chapters and Technical Studies
are publicly available on our website.**

www.vhmltd.com.au

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