CHAPTER 13

# Risk Identification

## 1. Introduction

**This chapter summarises the process undertaken to identify risk events, hazards, and their associated impacts during the Hazelwood Rehabilitation Project. The methodology is a continuation of a risk management process employed by ENGIE Hazelwood since 2015 and significantly expanded for the purpose of rehabilitation and closure in 2019.**

The expansion in 2019 identified risks in collaborative workshops with technical specialists from all the relevant technical disciplines associated with rehabilitation of a large brown coal mine site. The process in 2024, completed for this DMRP, has continued this process, importing refined knowledge gained from various additional rehabilitation and closure studies, stakeholder engagement, and importantly the appreciation of the evolution of risks over the temporal time periods of rehabilitation completion, project closure and finally, site relinquishment. As before, internal and external stakeholders, along with key technical specialists, were engaged to ensure a rigorous process was followed and additional considerations added where required.

### 1.1 RISK APPROACH SUMMARY

The purpose of the Risk Assessment was to capture potential risks that may occur during the remaining life of the project, including the completion of the planned rehabilitation, 'active' and 'passive' rehabilitation phases, followed by the post closure period and then the mine lease relinquishment phase.

The Earth Resources Regulator (ERR) was engaged early in the process to review the risk framework, structure and initial outcomes to gain feedback on the planned DMRP submission. This is one of the first submissions under the DMRP legislation and it is therefore informed by guidance materials that are currently available, such as ERR's risk matrices and associated consequence and likelihood criteria. ENGIE Hazelwood continues to adopt industry best practice risk management principles and methodologies to develop and execute the Risk Assessment component of the DMRP submission.

This Risk Assessment was facilitated by GHD with participation from ENGIE Hazelwood, the Mine Land Rehabilitation Authority (MLRA), and other subject matter specialists through a series of workshops. The Risk Assessment utilised the findings from the approved Risk Management Plan, *Appendix F - Ground Control Management Plan*, *Appendix G - Fire Risk Management Plan* and the 2019 Rehabilitation and Closure Plan (RCP), along with a suite of new analytical studies associated with rehabilitation and closure for the Hazelwood Mine, for the current DMRP submission.

The key objective of the rehabilitation project is that the end landform will be safe, stable, sustainable, and non-polluting, with as far as practical, minimal ongoing monitoring and maintenance requirements.

### 1.2 CLOSURE OBJECTIVES

The Risk Assessment is developed and assessed against the objectives defined in Chapter 9: *Rehabilitation Objectives.*

### 1.3 SCOPE

The scope of this study covers activities across the following three phases:

- **Phase 1:**
  Active Rehabilitation (includes lake filling)
- **Phase 2:**
  Passive Rehabilitation (post fill completion)
- **Phase 3:**
  Post Closure (period after relinquishment)

Each phase is further explained in *Figure 2.7 – Phases of project delivery*.

The 'active' rehabilitation and risk management timeline is approximately 20 years, driven predominantly by the time required to fill the mine void to RL +45m AHD. Some remaining risks, such as land movement, i.e. heave resulting from aquifer groundwater recovery, and lake water quality evolution have significant gestation times, based on key technical assessments, which in some cases will require a level of monitoring and maintenance beyond relinquishment.

The Risk Assessment only assesses risks where pathways are within the mining license (MIN5004) area.

The following aspects are excluded from the Risk Assessment:

- **Occupational health & safety (OHS) risks:** Injury, fatality or occupational health impacts to site workers including staff members and contractors during the active rehabilitation stage are excluded. These risks are to be managed by the site OHS personnel and processes, regulated through the *Occupational Health and Safety Act 2004 (Victoria)* and the *Occupational Health and Safety Regulations 2017 (Victoria)*. These risks are captured in the Major Mining Hazard (MMH) bowties.
- **Project risks:** This Risk Assessment does not include project risks such as financial, project delays or resourcing risks during the rehabilitation project.
- **ENGIE risks:** The Risk Assessment does not review or assess risk scenarios towards ENGIE infrastructure. However, ENGIE infrastructure which may impact services provided by external infrastructure was considered in the consequences.
- **Risks outside the mine licence:** The Hazelwood Cooling Pond and site of the former Power Station are outside the mine licence and were not included in the Risk Assessment
- **Reputational impacts:** Consequential reputation risks were excluded.

The ENGIE Hazelwood Risk Assessment process and its outputs have been generated to demonstrate ENGIE's commitment to ensuring the delivery of a safe, stable and sustainable final rehabilitated landform along with demonstrating to mining and rehabilitation regulators, government officials, external stakeholders and the community that the proposed rehabilitation of the mine can be achieved in a way which mitigates risk, as far as reasonably practicable. There are several key legislative requirements which provide some guidance that have been identified so as to assist in the development of the scope of the Risk Assessment. Refer to Chapter 5 – *Rehabilitation Obligations and Commitments for further details*.

The objective of the DMRP Risk Assessment is to review each rehabilitation activity and approach to the closure of each individual domain through a risk based lens, critically understanding any hazards and risks presented and proactively generating suitable preventative and mitigative strategies so as to meet ENGIE's obligation of delivering a stable, safe, sustainable, non-polluting final landform outcome. Additional informing requirements were taken from the Rehabilitation and Closure Plan Guidelines for the Mining Industry, set by the Department of Jobs, Precincts and Regions.

An excel template was created to complete three Risk Assessments per each feasible risk which aligned with each of the phases mentioned in Section 1.3 above. The Risk Register was established to align with the structure of the example Risk Register provided in Appendix C of the '*Preparation of Work Plans and Work Plan Variations – Guideline for Mining Projects*', Earth Resources Regulation 2020 (Version 1.3). The Risk Register was selected over other risk methodologies (e.g. Bowties) as it provided sufficient detail to analyse each risk during rehabilitation phases but also demonstrates how the risk rating and the required level of control evolved over time.

## 1.4 INTEGRATION WITH EES FRAMEWORK AND RISK REGISTER

The EES Risk Assessment framework and outcomes were developed prior to the DMRP Risk Assessment and was a primary input into the DMRP Risk Assessment process to ensure risk alignment. Some risks, assessed for the EES, included the same Consequence and Likelihood descriptors as the DMRP Risk Assessment, however they had an additional rating called "certainty" which added a third dimension to the EES Risk Assessment. This third dimension was intended to account for what information was technically available and known at the time of the Risk Assessment in order to appreciate how technical understanding of the risk, input design parameters and control measures may alter or materially differ over time periods. The addition of this third dimension to the DMRP Risk Assessment process acted to vary the overall ratings considerably when compared to the EES Risk Assessment. Each EES technical chapter explores in detail these implications and why risk ratings in some cases appear different. The DMRP Risk Register has references to the relevant EES technical chapters for cross referencing where applicable.

# 2. Project Domain Summary

The DRMP Risk Register was set out to systematically identify risks against closure EES domains, followed by the closure sub-domains, as shown in Table 13.1.

**Table 13.1: Table Domains & Sub-Domains**

| EES DOMAINS | | SUB-DOMAINS | | |
|---|---|---|---|---|
| NO. | TITLE | NO. | CLOSURE DOMAIN | DESCRIPTION |
| 1 | Mine void | 1 | Mine void lake | Mine void area filled with water at any particular stage of rehabilitation, progressing to a final level (currently estimated as RL +45 m AHD). |
| | | 2 | Mine batters and floor | All mine void batters from mine floor surface to the upper edge / crest of mine void batter walls including the area immediately adjacent to the crest.<br>Inclusive of a shoreline zone around the perimeter of the mine void where the final pit lake level (currently estimated as RL +45 m AHD) will interact with the batter surfaces. |
| | | 4 | Landfills and disposal areas | Ash storage area (HARA). |
| | | 6 | Infrastructure | Infrastructure systems and / or facilities. Systems for mitigating risk and facilitating safe operations and access. |
| 2 | Hazelwood Cooling Pond* | 5 | Watercourses, storages and diversion structures | Water storage, outlet structure and associated embankments |
| | | 6 | Infrastructure | Storage and transfer pumps for firefighting reserve |
| 3 | Mine surrounds | 3 | External overburden dumps | Landforms constructed from overburden material that are located external to the mine void area. |
| | | 4 | Landfills and disposal areas | Ash storage areas, waste dumps and asbestos landfill sites, regulated by associated EPA licences. |
| | | 5 | Watercourses, storages and diversion structures | Water management ponds such as the WEP, NORP etc that have an interim operational function<br>Water storages (operating dams) HCP, Recirc Pond, Clarification Pond etc (either operational or in decommissioning phase)<br>Water structure for diverting or channelling water such as MMD, EHC levee, MRFD, MRD levee. |
| | | 6 | Infrastructure | Infrastructure systems and / or facilities to service interim operations and rehabilitation activities<br>• Fire and water<br>• Depressurisation<br>• Electrical<br>• Buildings security and comms<br>• Roads, access, hardstands |
| | | 7 | Remaining land incl. conservation areas | Peripheral land generally outside the operational area, may have minimal disturbance or previously rehabilitated, Including leased land within MIN5004 area plus all land offsets and conservation areas under ENGIE Hazelwood's management. |
| 4 | Streams and Waterways | 5 | Watercourses, storages and diversion structures | Engineered diversion and associated embankments / levee structures that divert water flows |
| | | 7 | Remaining land incl. conservation areas | Land containing and adjacent to streams and water courses attributed to the maintenance of the stream (bank, flood plain and riparian zones) |
| | | 8 | Waterways | Natural water courses and diversions with reserves (usually formally recognised and draining a surface catchment) |
| 5 | All | - | - | - |

**Noting the Hazelwood Cooling Pond itself was not within scope for this Risk Assessment as it is outside of the mining licence area*

# 3. Sensitive Receptors

The consequence impacts on sensitive receptors are identified both internal (site based) and external to the mining lease area in accordance with the following categories:

- **Any member of the public**: public health, safety, amenity (incl. noise) and Aboriginal heritage
- **Land, property and infrastructure**: third party property, land use and nearby infrastructure such as highways, transmission lines, pipelines, schools and hospitals
- **Environment**: air, water, soil, vegetation, flora & fauna species, vegetation cover systems, surface water or groundwater quality

A list of Hazelwood DMRP sensitive receptors reviewed in this Risk Assessment is provided in provided in Appendix H.

# 4. Risk Assessment Criteria

The EES risk criteria was used to support the Risk Assessment process which was a modified version of the ERR risk criteria. The main changes made to the ERR criteria was in the consequence table, for example -

- Vibration impacts under “public amenity”
- Noise impacts under “public amenity”
- Change in environmental values under “surface water or groundwater”
- Water extraction and diversion of surface water under “surface water or groundwater”

The consequence criteria, likelihood criteria and risk matrix used are presented below.

**Table 13.2: Consequence Criteria**

| SEVERITY | CONSEQUENCE FOR “ANY MEMBER OF THE PUBLIC” – PUBLIC HEALTH, SAFETY, AMENITY AND ABORIGINAL HERITAGE | CONSEQUENCES FOR “LAND, PROPERTY & INFRASTRUCTURE” BEYOND THE BOUNDARY OF THE LICENCE AREA | CONSEQUENCES FOR “THE ENVIRONMENT” – AIR, WATER, SOIL, VEGETATION, FLORA & FAUNA SPECIES OTHER THAN FOR PLANNED AND APPROVED DISTURBANCES WITHIN THE LICENCE AREA |
|---|---|---|---|
| **Critical**<br>Hazard has critical impact, in terms of severity and/or duration.<br>Treatment or remediation effort is required, although some effects may be irreversible.<br>Remediation of environmental contamination would require significant private and public resources.<br>Hazard event would be the subject of widespread community outrage. | **Public health & safety:**<br>One or more fatalities or life-threatening injuries or illness. Public exposed to a severely debilitating chronic health impact or life-threatening hazard. One or more injuries resulting in permanent disablement.<br>**Public amenity:**<br>Community or multiple individuals continuously experience major losses of amenity from dust, odour, fumes, noise, vibration or other similar hazards over periods of weeks or longer.<br>**Aboriginal Heritage:**<br>Harm to features and/or places of Indigenous cultural value.<br>**Heritage:**<br>Irreversible damage, or destruction of a place, object or historical archaeological site listed on the Commonwealth National Heritage List, Victorian Heritage Register, Victorian Heritage Inventory, or local Heritage Overlay. | **Land & land uses:**<br>Permanent loss of production from primary production land >10 ha. Loss of annual – seasonal primary production from >100 ha of land.<br>Irreversible or long-term environmental damage (with rehabilitation taking years or longer) to >1 ha of National Park or other conservation reserve.<br>**Public & private property:**<br>Total damage to private or public property or infrastructure or loss of income resulting from this damage >$10 million.<br>Total loss of value of private property equivalent to >$10 million.<br>**Services provided by infrastructure:**<br>Important community services (e.g. transport, energy, health, telecommunications, education, water) suspended or significantly disrupted for extended period (weeks or longer). | **Environmental contamination event:**<br>Environmental contamination event (of air, soil-land and/or water) of a magnitude that a State-level incident response is required. Incident response, clean-up and rehabilitation expected to run for years and/or cost ≥$10 million.<br>**Native vegetation, flora species or fauna species:**<br>Environmental contamination event or other form of environmental damage leading to bioregional, State or national extinction of listed threatened species of native flora or fauna or vegetation community.<br>Irreversible or long-term (years) damage or environmental harm to ≥10 ha of native vegetation (not listed threatened vegetation community) or to ≥1 ha listed threatened native vegetation community. Deaths of hundreds (or more) of listed native flora or fauna species or native mammals.<br>Contamination or other environmental damage leading to deaths of native fauna well beyond (>1 km) the boundaries of the operation.<br>**Surface water or groundwater:**<br>Contamination of surface water / groundwater aquifer leading to change in environmental values as defined by Environmental Reference Standard for more than year.<br>Water extraction or diversion reduces surface water flows or groundwater available for environmental uses, with a critical effect on dependent species or ecosystems well beyond (>1 km) the boundaries of the operation that is irreversible or long-term (years). |

| SEVERITY | CONSEQUENCE FOR "ANY MEMBER OF THE PUBLIC" – PUBLIC HEALTH, SAFETY, AMENITY AND ABORIGINAL HERITAGE | CONSEQUENCES FOR "LAND, PROPERTY & INFRASTRUCTURE" BEYOND THE BOUNDARY OF THE LICENCE AREA | CONSEQUENCES FOR "THE ENVIRONMENT" – AIR, WATER, SOIL, VEGETATION, FLORA & FAUNA SPECIES OTHER THAN FOR PLANNED AND APPROVED DISTURBANCES WITHIN THE LICENCE AREA |
|---|---|---|---|
| **Major**<br>Hazard has major impact, in terms of severity, duration and/or frequency of occurrence.<br>Treatment or remediation effort is required. Some effects may be irreversible.<br>Remediation of environmental contamination would require significant private and public resources.<br>Hazard event would be the subject of widespread community concern. | **Public health & safety:**<br>One or more injuries or illness requiring surgery or resulting in long-term disablement. Public exposed to a hazard that results in hospitalization for treatment from injury or illness.<br>**Public amenity:**<br>Community or multiple individuals regularly experience (weekly-monthly basis) major losses of amenity due to dust, odour, fumes, noise, vibration or other similar hazards for multiple days on end.<br>**Heritage:**<br>Damage to a place, object or historical archaeological site listed on the Commonwealth National Heritage List, Victorian Heritage Register, Victorian Heritage Inventory, or local Heritage Overlay. Removal or relocation of elements associated with places, objects or historical archaeological sites. | **Land & land uses:**<br>Permanent loss of production from primary production land <10 ha. Loss of annual – seasonal primary production from 10-100 ha of land. Irreversible or long-term environmental damage to <1 ha of National Park or other conservation reserve or to ≥10 ha of other public land. Reversible damage to ≥1 ha of National Park or other conservation reserve or to ≥10 ha of other public land.<br>**Public & private property:**<br>Total damage to private or public property or infrastructure or loss of income resulting from this damage $1-$10 million. Total loss of value of private property equivalent to $1-$10 million.<br>**Services provided by infrastructure:**<br>Important community services (e.g. transport, energy, health, telecommunications, education) suspended or significantly disrupted for days or experiencing minor disruptions for long periods (weeks or longer). | **Environmental contamination event:**<br>Environmental contamination event (of air, soil-land and/or water) of a magnitude that would necessitate a regional emergency response management incident response.<br>Clean-up and rehabilitation expected to run for months and/or cost $1-$10 million.<br>**Native vegetation, flora species or fauna species:**<br>Environmental contamination event or other form of environmental damage leading to local extinction of listed threatened species of native flora or fauna or vegetation community.<br>Deaths up to ~100 listed native flora or fauna species or native mammals.<br>Major damage or environment harm to 1-10 ha of native vegetation (not listed threatened vegetation community) or to <1 ha listed threatened native vegetation community that will be irreversible or take years to recover from.<br>**Surface water or groundwater:**<br>Contamination of surface water / groundwater aquifer leading to change in environmental values as defined by Environmental Reference Standard for up to one year.<br>Water extraction or diversion reduces surface water flows or groundwater available for environmental uses, with a major effect on dependent species or ecosystems that will be irreversible or take years to recover from. |
| **Moderate**<br>Hazard has moderate impact, in terms of severity, duration and/or frequency of occurrence.<br>Moderate treatment or remediation effort may be required.<br>Hazard event would be the subject of limited community concern. | **Public health & safety:**<br>One or more injuries or illness requiring treatment by a physician or hospitalisation.<br>Public exposed to a hazard that results in injuries or health effects requiring treatment by a physician.<br>**Public amenity:**<br>Community or multiple individuals regularly (weekly-monthly basis) experience significant loss of amenity from dust, odour, fumes, light, noise, vibration or other similar hazards.<br>**Heritage:**<br>Works to a place, object or historical archaeological site that will not alter the cultural significance as stated on the Commonwealth National Heritage List, Victorian Heritage Register, Victorian Heritage Inventory, or local Heritage Overlay. | **Land & land uses:**<br>Loss of annual – seasonal primary production from <10 ha of land.<br>Short-term (days – weeks) disruption to 10-100 ha of primary production land.<br>Reversible damage to <1 ha of National Park or other conservation reserve or to <10 ha of other public land.<br>**Public & private property:**<br>Individual hazard event causes total damage to private or public property or infrastructure or loss of income resulting from this damage $50k - $1 million.<br>Total loss of value of private property equivalent to $1-$10 million.<br>**Services provided by infrastructure:**<br>Important community services (e.g. transport, energy, health, telecommunications, education) suspended or significantly disrupted for up to 1 day or experiencing minor disruptions for weeks. | **Environmental contamination event:**<br>Environmental contamination event (of air, soil-land and/or water) with clean-up and rehabilitation expected to run for weeks and/or cost $10k -$1 million.<br>**Native vegetation, flora species or fauna species:**<br>Environmental contamination event or other form of environmental damage leading to deaths of a small number of listed threatened flora or fauna species or native mammals.<br>Reversible damage or environment harm to <10 ha of non-listed native vegetation or <1 ha of listed native vegetation community.<br>**Surface water or groundwater:**<br>Localised contamination of surface water / groundwater aquifer leading to change in environmental values as defined by Environmental Reference Standard for weeks to months.<br>Water extraction or diversion reduces surface water flows or groundwater available for environmental uses, with a noticeable but short term (weeks or days) effect on dependent species or ecosystems. |

| SEVERITY | CONSEQUENCE FOR "ANY MEMBER OF THE PUBLIC" – PUBLIC HEALTH, SAFETY, AMENITY AND ABORIGINAL HERITAGE | CONSEQUENCES FOR "LAND, PROPERTY & INFRASTRUCTURE" BEYOND THE BOUNDARY OF THE LICENCE AREA | CONSEQUENCES FOR "THE ENVIRONMENT" – AIR, WATER, SOIL, VEGETATION, FLORA & FAUNA SPECIES OTHER THAN FOR PLANNED AND APPROVED DISTURBANCES WITHIN THE LICENCE AREA |
|---|---|---|---|
| **Minor**<br>Hazard is perceived but has minor and typical temporary effects.<br>Some remediation may be required. | **Public health & safety:**<br>One or more injuries or illness requiring first aid treatment.<br>Public exposed to a hazard that results in injuries or adverse health effects requiring first aid treatment.<br>**Public amenity:**<br>Dust, odour, fumes, light, noise, vibration or other similar hazards infrequently (no more than monthly) have a minor effect on the amenity of the community or individual.<br>**Heritage**:<br>Isolated damage to regionally or locally significant natural or historic heritage features that is readily rectified. | **Land & land uses:**<br>Minor damage to agricultural land or public land not requiring active rehabilitation. Temporary and small-scale disruption to agricultural production (days, 1 – 10ha).<br>**Public & private property:**<br>Total damage to private or public property or infrastructure $1 - $50k.<br>Total loss of value of private property equivalent to $1 - $50k.<br>**Services provided by infrastructure:**<br>Important community services (e.g. transport, energy, health, telecommunications, education) suspended or significantly disrupted for short period (hours). | **Environmental contamination event:**<br>Minor environmental contamination event (of air, soil-land and/or water). Clean-up and rehabilitation may be required, but can be completed within days.<br>**Native vegetation, flora species or fauna** species:<br>Minor damage or environment harm to <1 ha of native vegetation (not listed threatened vegetation community) that can be recovered in weeks to months.<br>Minor contamination or other environmental damage that affects native fauna species populations, but does not kill individuals or disrupt breeding or other important ecological processes.<br>**Surface water or groundwater:**<br>Minor contamination of natural watery or wetland occurs, but water quality remains within applicable EPA or ANZECC guidelines for existing environmental values.<br>Water extraction or diversion reduces surface water flows or groundwater available for environmental uses, but with no detectable effect on dependent species or ecosystems and carried out within terms of water license. |
| **Insignificant**<br>Impacts are barely recognized and/or quickly recovered from. No specific remediation required. | **Public health & safety:**<br>An injury or ailment that does not require medical or first aid treatment.<br>**Public amenity:**<br>Dust, odour, fumes, light, noise, vibration or other similar hazards infrequently (no more than monthly) contribute to a small reduction in the amenity of the community or individual. | **Land & land uses:**<br>Minor, temporary disruptions to primary production (<days) from <1 ha of land.<br>**Public & private property:**<br>Total damage to private or public property or infrastructure <$1k.<br>Total loss of value of private property equivalent to <$1k.<br>**Services provided by infrastructure:**<br>Important community services (e.g. transport, energy, health, telecommunications, education) maintained, but experiencing minor disruptions or delays. | Hazard event with minimal environmental impact and no noticeable effect beyond the immediate occurrence or expression of the hazard. |

### Table 13.3: Likelihood Criteria

| LIKELIHOOD | DESCRIPTION | PROBABILITY OF EVENT OCCURRING |
|---|---|---|
| Almost Certain | The risk event is expected to occur in most circumstances. | 90 – 100% |
| Likely | The risk event will probably occur in most circumstances. | 70 – 90% |
| Possible | The risk event might occur at some time. | 30 – 70% |
| Unlikely | The risk event could occur in some uncommon circumstances. | 5 – 30% |
| Rare | Highly unlikely, but the risk event may occur in exceptional circumstances. | 0 – 5% |

### Table 13.4: Risk Assessment Matrix

| | INSIGNIFICANT | MINOR | MODERATE | MAJOR | CRITICAL |
|---|---|---|---|---|---|
| **Rare** | Low | Low | Medium | Medium | High |
| **Unlikely** | Low | Low | Medium | High | High |
| **Possible** | Low | Medium | Medium | High | Very High |
| **Likely** | Medium | Medium | High | Very High | Very High |
| **Almost Certain** | Medium | High | Very High | Very High | Very High |

# 5. Risk Indentification

A Source Pathway Receptor (SPR) model was used to collate risks in the DMRP Risk Register. This allowed for credible linkages of 'risk sources to receptors' to be identified. The SPR analysis captured factors that have the potential to impact the site, external receptors and may result in non-conformance to the stated closure objectives.

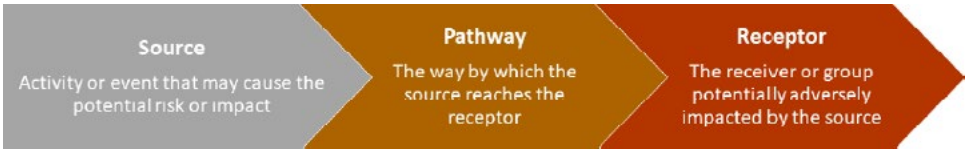


*Figure 13.1: SPR Critical Elements and Linkages*

Each individual risk source was assessed, with each having the potential to have more than one pathway leading to more than one receptor. Each risk source was reviewed for applicability against each of the phases described in Section 1.3, to replace the typical 'point-in-time' assessment completed on risks where 'inherent', 'current' and 'residual' language is used.

# 6. Summary of Process

The DMRP Risk Register was initially prepopulated using existing Risk Assessments performed prior to the DMRP submission. This included gathering information from:

**Table 13.5: Risk Assessment References**

| NO. | TITLE | DOCUMENT DATE |
|---|---|---|
| 1 | Hazelwood Mine Rehabilitation & closure Plan – Volume 1, 2 & 3 | February 2019 |
| 2 | ENGIE Hazelwood Mine Risk Management Plan (RMP) | December 2019 |
| 3 | ENGIE Hazelwood Rehabilitation Closure Plan Tier 1 & Tier 2 Risk Assessment | November 2019 |
| 4 | Hazelwood Rehabilitation Project Ground Control Management Plan (GCMP) v8.1 | July 2023 |
| 5 | Fire Risk Management Plan (FRMP) | December 2019 / 2023 |
| 6 | Environment Management Plan (EMP) | April 2009 |
| 7 | Hazelwood Rehabilitation Project EES Risk Assessment Guidance Note v4 | November 2023 |

The risks identified across these references had slightly different scopes and looked at impacts outside of the scope of this DMRP. Therefore, risks were reviewed and only a relevant selection of the risks were adopted to assist with the initial review. The Risk Register was then revised in two sets of workshops. The first tranche of workshops was conducted in May 2024 which reviewed the initial identification of risks:

- Day 1: Water quality, dams & water retaining structures, contamination
- Day 2: Coal fire, vegetation fire, ground / batter stability, erosion
- Day 3: Environment

Beyond these workshops the Risk Register was updated to include details from the Bowties completed by ENGIE in 2019. These updates importantly drew upon ENGIE's network of Critical Controls and accompanying Performance Standards, currently employed as risk control measures for several of the major risk areas within the mine and its surrounds. The risks from the first set of workshops were also reviewed and separated into single source events to ensure an appropriate level of scrutiny and risk delineation.

The second tranche of workshops was conducted in July and August 2024 and were aimed at reviewing the updated Risk Register. The workshops looked at:

- Day 1: Geotechnical risks
- Day 2: Fire and Security risks
- Day 3 and 4: Environmental risks

This was the final set of workshops held in order to develop the DMRP Risk Register with a much broader group involving professionals from GHD, ENGIE, MLRA, WSP, ERM, AECOM, CQM and RGS. The objectives were to:

- Ensure the validation of listed controls,
- identify the necessary performance standards required for post relinquishment,
- ensure the level of detail in the Risk Register is applicable for the DMRP submission and,
- last opportunity to identify any missing risks.

## 6.1 SUMMARY OF THE NUMBER OF RISKS AND EVENTS

As indicated previously, a number of ENGIE technical studies, previous statutory documents, the RCP of 2019 and the EES were initially used to pre-populate this Risk Register with risk sources and events. This was then reviewed via a number of technical discipline workshops to align with the proposed DMRP assessment methodology and scope. Additional risks and missing events were then supplemented. A summary of all the identified risk sources / events is presented in Table 13.6. Refer to the *DMRP Risk Register in Appendix I* for full details.

### Table 13.6: Summary of Risk Events

| RISK ID | CATEGORY | SOURCE / EVENT (S) |
|---|---|---|
| 1, 2, 5 | Fire | Coal fire |
| 3, 4 | Fire | Vegetation fire |
| 6 | Security | Unauthorised access |
| 7 | Security | Authorised access |
| 8 | Security | Malicious acts or arson on site |
| 9, 10, 14 | Geotechnical | Geotechnical instability |
| 11, 12, 13 | Geotechnical | Erosion |
| 15 | Geotechnical | HARE failure |
| 16 | Geotechnical | Infiltration of water through Morwell Main Drain (MMD) |
| 17 | Geotechnical | Differential ground movement |
| 18 | Geotechnical | Floor heave |
| 19 | Environment | EPA Licensed landfills (ash, hard rubbish & asbestos landfill) loss of containment and seepage |
| 20 | Environment | Dams and water retaining structure failure |
| 21 | Environment | Extreme rainfall event |
| 22 | Environment | Acid Sulphate Soils (ASS) |
| 23 | Environment | Dust impact |
| 24 | Environment | Noise and vibration impact |
| 25 | Environment | Visual amenity impact |
| 26 | Environment | Odour and fumes impact |
| 27 | Environment | Greenhouse gas impact |
| 28 | Environment | Declared weed and pathogens impact |
| 29, 32 | Environment | Pit lake impacted |
| 30 | Environment | Water quality degrades in the pit lake |
| 31, 33, 34, 35, 36, 37 | Environment | Poor pit lake water quality |
| 38 | Environment | Poor quality seepage or runoff |
| 39 | Environment | Plant or animal pathogens |
| 40 | Environment | Unwanted natural recruitment of vegetation |
| 41 | Environment | Deterioration and damage of remnant and indigenous vegetation |
| 42, 43 | Environment | Aboriginal cultural and historic heritage values |
| 44 | Environment | Inappropriate management and disposal of materials and waste |
| 45 | Environment | Spread / increase numbers of pest animals including fox, rabbit, deer and carp |
| 46 | Environment | Rehabilitated land not meeting agricultural productivity requirements |

### 6.2 SUMMARY OF THE NUMBER OF RISKS PER PHASES

A summary of the total risks identified for each category, as well as a breakdown of the number of risks at each phase, is shown in Table 13.7. Refer to the *DMRP Risk Register* in *Appendix I* for full details.

**Table 13.7: Summary of Contributors**

| CATEGORY | TOTAL RISKS IDENTIFIED | NUMBER OF RISKS AT EACH PHASE | | |
|---|---|---|---|---|
| | | ACTIVE REHABILITATION | PASSIVE REHABILITATION | POST CLOSURE |
| Fire | 5 | 5 | 5 | 5 |
| Security | 3 | 3 | 3 | 3 |
| Geotechnical | 10 | 10 | 10 | 10 |
| Environment | 28 | 26 | 25 | 21 |
| **Total risks** | **46** | **44** | **43** | **39** |

The number of environmental risks at each phase have been reduced due to the risk being either eliminated or not assessed during that stage as it is no longer deemed to be relevant.

# 7. Conclusion

This chapter presents the process undertaken to identify risk events, hazards and their associated impacts during the implementation of the Hazelwood Rehabilitation Project. The methodology is a continuation of a risk management process employed by ENGIE since 2015 and significantly expanded for the purpose of rehabilitation and closure in 2019. The process in 2024 has continued this development, importing refined knowledge gleaned from various additional rehabilitation and closure studies, stakeholder engagement and importantly the appreciation of the evolution of risks over the time periods of rehabilitation completion, project closure and finally, site relinquishment.

This Risk Assessment was facilitated by GHD with participation from ENGIE, the Mine Land Rehabilitation Authority (MLRA) and other subject matter specialists through a series of workshops. The Risk Assessment utilised the findings from the approved Risk Management Plan, Ground Control Management Plan, Fire Risk Management Plan and the 2019 Rehabilitation and Closure Plan (RCP), along with a suite of new analytical studies associated with rehabilitation and closure for the Hazelwood Mine, for the current DMRP submission.

A Source Pathway Receptor (SPR) model was used to collate risks in the DMRP Risk Register. This allowed for credible linkages of 'risk sources to receptors' to be identified. The SPR analysis captured factors that have the potential to impact the site, external receptors and may result in non-conformance to the stated closure objectives.

Each individual risk source was assessed, with each having the potential to have more than one pathway leading to more than one receptor. Each risk source was reviewed for applicability against each of the phases to replace the typical 'point-in-time' assessment completed on risks where 'inherent', 'current' and 'residual' language is used.

A total of 46 risks were identified in the DMRP Risk Register with:

- 5 risks associated with fire
- 3 risks associated with security
- 10 risks associated with geotechnical
- 28 risks associated with environmental

Most of the risks identified in the assessment are included in the Environment category as many of the activities associated with the Hazelwood Rehabilitation Project revolve around the modifying of the post mining landform to a safe, stable, sustainable and non-polluting final rehabilitation landform which presents a number of technical challenges when dealing with surface water, groundwater, native vegetation, flora and fauna.

*Chapter 14: Risk Assessment and Management* has been written to expand on the Risk Assessment outcomes per technical discipline and provide controls for management across the Rehabilitation Project. In addition, Appendix B provides information to be included in the *Post Closure Risk Management Plan*.