



# **MOUNT PLEASANT OPERATION**

## **SURFACE AND GROUND WATER RESPONSE PLAN**

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## 1 INTRODUCTION

The Mount Pleasant Operation (MPO) is located in the Upper Hunter Valley of New South Wales (NSW), approximately 3 kilometres (km) north-west of Muswellbrook and approximately 50 km north-west of Singleton (Figure 1). The village of Aberdeen and locality of Kayuga are also located approximately 5 km north-northeast and 1 km north of the MPO boundary, respectively (Figure 1). MACH Energy purchased the MPO from Coal & Allied Operations Pty Ltd (Coal & Allied) in 2016.

MACH Mount Pleasant Operations Pty Ltd is the manager of the MPO as agent for, and on behalf of, the unincorporated Mount Pleasant Joint Venture between MACH Energy Australia Pty Ltd (MACH Energy) (95 per cent [%] owner) and J.C.D. Australia Pty Ltd (5% owner). This Surface and Ground Water Response Plan (SGWRP) is implemented at the MPO by MACH Energy.

The initial development application for the MPO was made in 1997. This was supported by an Environmental Impact Statement (EIS) prepared by Environmental Resources Management (ERM) Mitchell McCotter (ERM Mitchell McCotter, 1997). On 22 December 1999, the then Minister for Urban Affairs and Planning granted Development Consent DA 92/97 to Coal & Allied. This allowed for the “Construction and operation of an open cut coal mine, coal preparation plant, transport and rail loading facilities and associated facilities” at the MPO. The consent allowed for operations 24 hours per day seven days per week and the extraction of 197 million tonnes (Mt) of run-of-mine (ROM) coal over a 21 year period, at a rate of up to 10.5 Mt of ROM coal per year.

The Mount Pleasant Project Modification (MOD 1) was submitted on 19 May 2010 with a supporting Environmental Assessment (EA) prepared by EMGA Mitchell McLennan (EMGA Mitchell McLennan, 2010). MOD 1 included the provision of an infrastructure envelope for siting the mine infrastructure, the provision of an optional conveyor/service corridor linking the MPO facilities with the Muswellbrook-Ulan Rail Line and modification of the existing Development Consent DA 92/97 boundaries to accommodate the optional conveyor/service corridor and minor administrative changes. MOD 1 was approved on 19 September 2011.

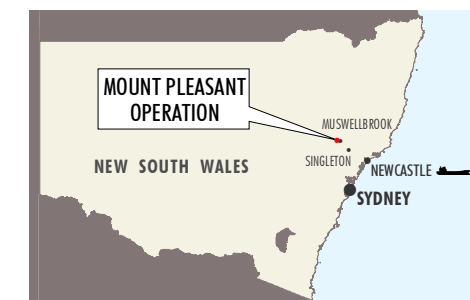
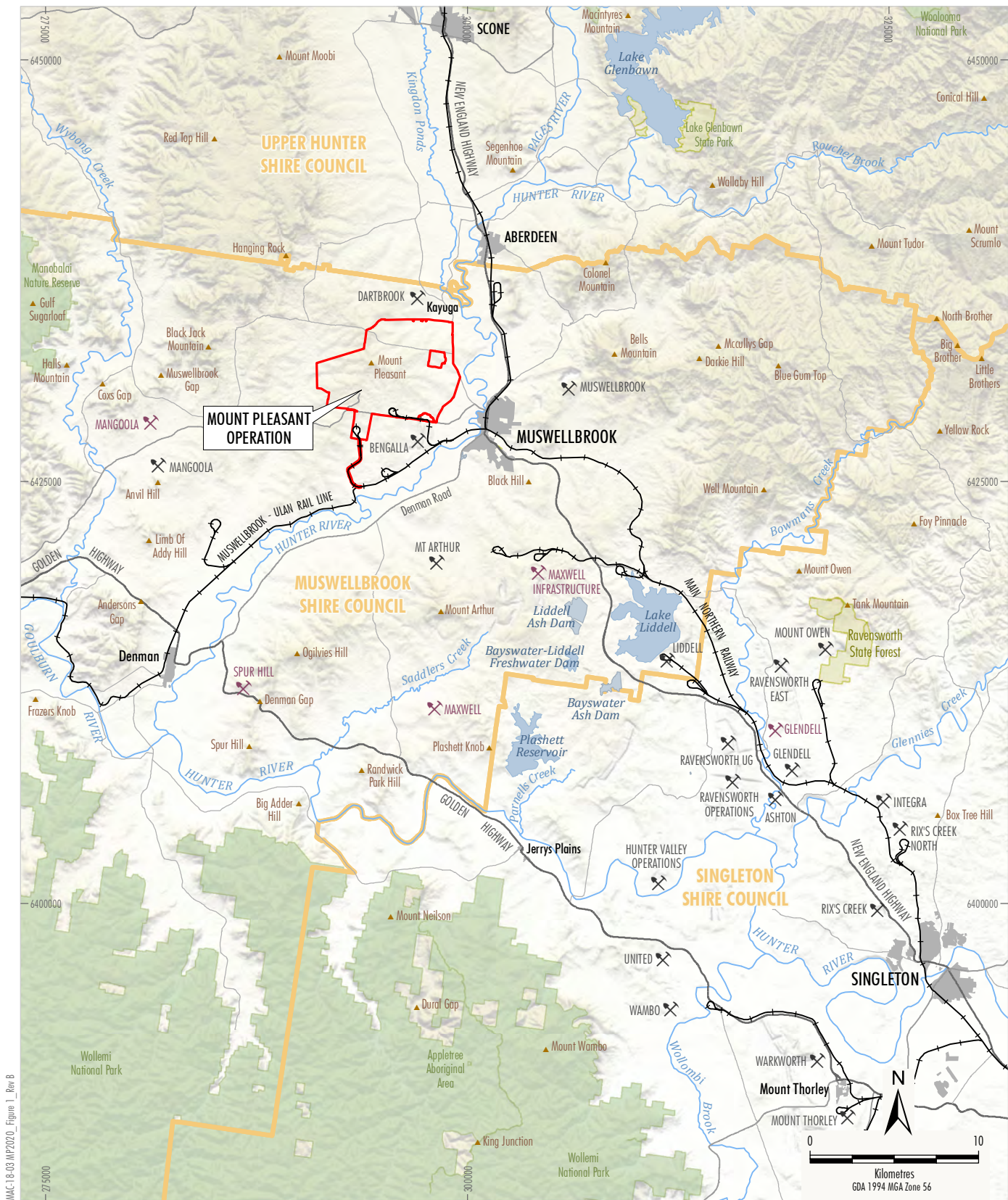
The MPO South Pit Haul Road Modification (MOD 2) was submitted on 30 January 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017a). MOD 2 proposed to realign an internal haul road to enable more efficient access to the South Pit open cut, with no other material changes to the approved MPO. MOD 2 was approved on 29 March 2017.

The MPO Mine Optimisation Modification (MOD 3) was submitted on 31 May 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017b). MOD 3 comprised an extension to the time limit on mining operations (to 22 December 2026) and extensions to the South Pit Eastern Out of Pit Emplacement to facilitate development of an improved final landform. MOD 3 was approved on 24 August 2018.

The MPO Rail Modification (MOD 4) was submitted on 18 December 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017c). MOD 4 proposed the following changes:

- duplication of the approved rail spur, rail loop, conveyor and rail load-out facility and associated services;
- duplication of the Hunter River water supply pump station, water pipeline and associated electricity supply that followed the original rail spur alignment; and
- demolition and removal of the redundant approved infrastructure within the extent of the Bengalla Mine, once the new rail, product loading and water supply infrastructure has been commissioned and is fully operational.





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**Project Location**

**Figure 1**

MOD 4 was approved on 16 November 2018 by the Secretary of the Department of Planning and Environment (under Delegation). Appendix 2 of the modified Development Consent DA 92/97 illustrates the Conceptual Project Layout Plan of the approved MPO at 2021 and 2025, Approved Surface Disturbance Plan and Conceptual Final Landform (Attachment 1) incorporating the MOD 4 infrastructure relocations.

## **1.1 PURPOSE AND SCOPE**

This SGWRP has been prepared by MACH Energy to satisfy the requirements under Development Consent DA 92/97 (as modified) and specifically Condition 28(e), Schedule 3.

The SGWRP applies to all employees and contractors at the MPO and covers all areas within the MPO boundary. The SGWRP applies to the life of the MPO, including (but not limited to) the period of mining operations specified in Development Consent DA 92/97, which currently permits mining until 22 December 2026. As required by Condition 5, Schedule 2 of Development Consent DA 92/97, the SGWRP will continue to apply (excluding mining operations) beyond 22 December 2026, as required, until the rehabilitation and any additional undertakings (required by the Secretary of the Department of Planning, Industry and the Environment [DPIE], or the Division of Mining, Exploration and Geoscience [MEG] within the Department for Regional NSW) have been carried out satisfactorily.

This SGWRP has been prepared to manage surface water and groundwater related impacts associated with construction and operation of the MPO, including for example, initial establishment and development works, open cut mining, operation of the coal handling and preparation plant, rail spur/loop and Fines Emplacement Area, and the supply of water to the MPO.

## **1.2 STRUCTURE OF THE SGWRP**

This SGWRP is a component of the Water Management Plan (WMP) for the MPO.

The remainder of the SGWRP is structured as follows:

- Section 2: Outlines the statutory requirements relevant to this SGWRP.
- Section 3: Describes the response protocols for trigger events which may occur at the MPO.
- Section 4: Provides potential contingency measures for the MPO.
- Section 5: Describes the review process for MPO documentation, including in particular for this SGWRP.
- Section 6: Outlines the reporting procedures proposed for the MPO.
- Section 7: Provides a list of references cited in this report.

## 2 STATUTORY OBLIGATIONS

MACH Energy's statutory obligations are contained in:

- the conditions of Development Consent DA 92/97 (as modified);
- the condition of the Commonwealth Approval EPBC 2011/5795;
- relevant licences (including Environment Protection Licence [EPL] 20850), permits and mining leases (MLs) (ML 1645, ML 1708, ML 1709, ML 1713, ML 1750 and ML 1808); and
- other relevant legislation.

Obligations relevant to this SGWRP are described below.

### 2.1 DEVELOPMENT CONSENT DA 92/97

The conditions of Development Consent DA 92/97 relevant to the content and structure of this SGWRP are described below. A comprehensive list of all conditions in Development Consent DA 92/97 relevant to water is provided in the WMP.

#### 2.1.1 SGWRP Requirements

Condition 28(e), Schedule 3 of Development Consent DA 92/97 requires the preparation of a SGWRP (refer Table 1).

**Table 1**  
**Surface and Groundwater Response Plan Development Consent DA 92/97 Conditions**

MPO Development Consent DA 92/97 Schedule 3	Section where addressed in this SGWRP Document
<p>28. The Applicant must prepare a Water Management Plan for the development to the satisfaction of the Secretary. This plan must be prepared in consultation with DoI Water and EPA, and be submitted to the Secretary for approval by 30 June 2019, unless otherwise agreed by the Secretary.</p> <p>The plan must include:</p> <p>...</p> <p>(e) a Surface and Ground Water Response Plan, which must include:</p>	
<ul style="list-style-type: none"> <li>• a response protocol for any exceedances of the surface water and groundwater assessment criteria;</li> </ul>	Section 3
<ul style="list-style-type: none"> <li>• measures to offset the loss of any baseflow to watercourses caused by the development;</li> </ul>	Section 4.1
<ul style="list-style-type: none"> <li>• measures to prevent, minimise or offset groundwater leakage from alluvial aquifers caused by the development;</li> </ul>	Section 4.2
<ul style="list-style-type: none"> <li>• measures to compensate landowners of privately-owned land whose water supply is adversely affected by the development; and</li> </ul>	Section 4.3
<ul style="list-style-type: none"> <li>• measures to mitigate and/or offset any adverse impacts on groundwater dependent ecosystems or riparian vegetation.</li> </ul>	Section 4.4



## 2.1.2 Management Plan (General) Requirements

Condition 2, Schedule 5 of Development Consent DA 92/97 outlines the general management plan requirements that are applicable to the preparation of the SGWRP.

Table 2 presents these requirements and indicates where each is addressed within this SGWRP.

**Table 2**  
**General Development Consent DA 92/97 Conditions**

<b>MPO Development Consent DA 92/97 Schedule 5</b>	<b>Section where addressed in this SGWRP Document</b>
2. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	
(a) detailed baseline data;	Refer to the Surface Water Management Plan (SWMP) and Groundwater Management Plan (GWMP)
(b) a description of: <ul style="list-style-type: none"> <li>the relevant statutory requirements (including any relevant consent, licence or lease conditions);</li> </ul>	Section 2
<ul style="list-style-type: none"> <li>any relevant limits or performance measures/criteria;</li> </ul>	Refer to the SWMP and GWMP
<ul style="list-style-type: none"> <li>the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</li> </ul>	Section 3
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Sections 3 and 4 and refer to the SWMP and GWMP
(d) a program to monitor and report on the: <ul style="list-style-type: none"> <li>impacts and environmental performance of the development;</li> <li>effectiveness of any management measures (see c above);</li> </ul>	Refer to the SWMP and GWMP
(e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 4
(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 5
(g) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>incidents;</li> <li>complaints;</li> <li>non-compliances with statutory requirements; and</li> <li>exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul>	Section 6
(h) a protocol for periodic review of the plan. <i>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i>	Section 5

## 2.2 LICENCES, PERMITS AND LEASES

A description of licences, permits and leases relevant to the MPO is provided in the WMP, SWMP and GWMP.

## 2.3 OTHER LEGISLATION

A description of other legislation relevant to the MPO is provided in the WMP, SWMP and GWMP.



### 3 RESPONSE PROTOCOLS

Trigger response protocols have been developed by MACH Energy to address potential impacts to surface water and/or groundwater that may arise from mining activities. These include surface water impact and stream health assessment criteria defined in the SWMP and groundwater impact assessment criteria defined in the GWMP.

Each response protocol outlines the trigger conditions for potential impacts and the investigation and response protocols that will be implemented if an incident or trigger exceedance has occurred or a complaint is reported. If at any time during the investigation protocol the trigger exceedance/complaint is deemed not to have occurred as a result of activities at the MPO, the response protocol can be ceased without completing the remaining steps.

#### 3.1 SURFACE WATER INVESTIGATIONS

MACH Energy has developed a surface water response protocol to ensure all trigger exceedances and complaints related to surface water are appropriately investigated and addressed. Details are included in the individual response protocols below.

##### 3.1.1 Surface Water Quality Response Protocol

Site specific triggers for surface water quality criteria have been set for electrical conductivity (EC), pH and total suspended solids (TSS) levels at three monitoring locations downstream of the MPO on the Hunter River.

Consistent with the Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Guidelines (2000), these criteria have been defined in terms of persistent statistical variation from baseline data and comparison with upstream monitored values. Default trigger levels developed using the ANZECC & ARMCANZ (2000) guidelines have been established for other sites in the MPO area which did not have sufficient data to generate site specific trigger values. Details are provided in Section 6.1 of the SWMP.

In the event that one of the water quality impact assessment criteria is triggered at the monitoring locations above, the response protocol in Table 3 will be implemented.

**Table 3**  
**Surface Water Quality Response Protocol**

Response Protocol	
Trigger	<ul style="list-style-type: none"> <li>a water quality indicator at a downstream water monitoring location is above (or outside the range) of trigger levels (refer to Table 9 of the SWMP) for three consecutive sampling events; and</li> <li>a water quality indicator at a downstream water monitoring location is above (or below in event of a trigger of the lower pH limit) the corresponding upstream monitoring location (where such a monitoring location exists) sampled on the same day.</li> </ul>

**Table 3 (Continued)**  
**Surface Water Quality Response Protocol**

Response Protocol	
Investigation	<ol style="list-style-type: none"> <li>1. Notify the MACH Energy Environmental Superintendent within 24 hours of becoming aware of the trigger event.</li> <li>2. Check and validate the data which indicates an exceedance of the trigger conditions.</li> <li>3. Collect and analyse supplementary samples of the exceedance parameter (as well as any other relevant parameters) upstream (where possible) and downstream of the MPO, to assess whether the exceedance is ongoing.</li> <li>4. Assess any changes to MACH Energy activities and inspect all relevant water management structures and infrastructure, and erosion and sediment controls in the area of the trigger event.</li> <li>5. Assess conditions (climatic, hydrological, hydrogeological and changes in land use activities in the catchment – including other mining activities and riparian revegetation works), both preceding and during the event and assess their impact.</li> <li>6. For the Hunter River monitoring locations, investigate changes in continuously recorded salinity values over time and compare with Department of Planning, Industry and Environment– Water (DPIE Water) stream gauging stations located on the river, to assess if any trends are evident.</li> <li>7. For the Hunter River, assess whether releases were occurring from Glenbawn Dam or other mines.</li> <li>8. Identify plausible and possible causes of the exceedance.</li> <li>9. Decide if the exceedance was directly caused by or predominantly as a result of activities being undertaken by or directly related to the MPO.</li> <li>10. If required (i.e. if it is deemed that the exceedance was directly caused by or predominantly as a result of activities being undertaken by or directly related to the MPO), engage a suitably qualified aquatic ecologist or similar to determine if any material harm to the surface water ecosystems have occurred.</li> <li>11. Provide a preliminary investigation report to the DPIE, Environment Protection Authority (EPA) and DPIE Water within seven days of identifying the trigger exceedance.</li> </ol>
Response	<ul style="list-style-type: none"> <li>• Develop/design contingency and remedial measures based on the results of the above investigations. Contingency and remedial measures considered practical for implementation may include: <ul style="list-style-type: none"> <li>– notifying local landholders;</li> <li>– providing an alternative water source for the duration of water quality impact caused by the incident/non-compliance;</li> <li>– reviewing and refining the Surface Water Management Plan;</li> <li>– reviewing and refining processes for inspection, maintenance and siting of water management infrastructure (e.g. dams, pipelines, pumps);</li> <li>– repairing, replacing, or constructing new water management infrastructure; and</li> <li>– developing and implementing a training package specifically related to the cause of the incident/non-compliance.</li> </ul> </li> <li>• Communicate results of investigation, contingency and remedial measures to government agencies as required and summarise in the Annual Review.</li> <li>• Review and update the WMP and resubmit to the DPIE (if required).</li> </ul>

### 3.1.2 Stream Health Response Protocol

Stream health assessment triggers have been developed based on the Spring 2017 monitoring round results, which is the only contemporary survey undertaken prior to commencement of operations at the MPO. Using the Spring 2017 monitoring results, baseline stream health band of impairment scores were allocated to each stream health monitoring site based upon where their O/E<sup>1</sup> taxa values fell within a standardised range. Details are provided in Section 6.2 of the SWMP.

In the event that the stream health assessment criteria is triggered at a downstream monitoring site, the response protocol in Table 4 will be implemented.

<sup>1</sup> O/E taxa scores are obtained by comparing the Observed (O) numbers of macro invertebrates at the site with the Expected (E) number of macro invertebrates which could be found at the site, if the site was in a natural state (i.e. had not been disturbed).

**Table 4**  
**Stream Health Response Protocol**

Response Protocol	
Trigger	A stream health indicator at a particular downstream monitoring site falls below the specified trigger levels (refer to Table 11 of the SWMP), and the stream health indicator at a corresponding upstream monitoring site remains the same for two successive monitoring rounds <sup>2</sup> .
Investigation	<ol style="list-style-type: none"> <li>1. Notify the MACH Energy Environmental Superintendent within 24 hours of becoming aware of the trigger event.</li> <li>2. Check and validate the data which indicates an exceedance of the trigger conditions.</li> <li>3. Compare data with other stream health data available in the vicinity (e.g. Muscle Creek and Dart Brook).</li> <li>4. Undertake supplementary stream health investigations upstream (where possible) and downstream of the MPO.</li> <li>5. Assess any changes to MACH Energy activities and inspect all relevant water management structures and infrastructure, and erosion and sediment controls in the area of the trigger event.</li> <li>6. Assess conditions (climatic, hydrological, hydrogeological and changes in land use activities in the catchment – including other mining/pastoral activities and riparian revegetation works), both preceding and during the event and assess their impact.</li> <li>7. Check water quality data to see if any trend is evident.</li> <li>8. Identify plausible and possible causative mechanisms and assess/quantify these against all relevant data and information to identify most likely causes.</li> <li>9. Decide if the exceedance was directly caused by or predominantly as a result of activities being undertaken by or directly related to the MPO. If required (i.e. if it is deemed that the exceedance was directly caused by or predominantly as a result of activities being undertaken by or directly related to the MPO), engage a suitably qualified aquatic ecologist or similar to determine the cause of the stream health deterioration.</li> <li>10. Provide a preliminary investigation report to the DPIE, EPA and DPIE Water when stream health monitoring and investigation is complete.</li> </ol>
Response	<ul style="list-style-type: none"> <li>• Develop/design contingency and remedial measures based on the results of the above investigations. Contingency and remedial measures considered practical for implementation may include: <ul style="list-style-type: none"> <li>– undertaking stream bank remedial works including desilting and revegetation works;</li> <li>– reviewing and refining the stream health and surface water monitoring programs;</li> <li>– reviewing and refining processes for inspection, maintenance and siting of water management infrastructure (e.g. dams, pipelines, pumps);</li> <li>– repairing, replacing, or constructing new or enlarged water management infrastructure; and</li> <li>– restricting stock access to affected areas of the stream.</li> </ul> </li> <li>• Communicate results of investigation, contingency and remedial measures to government agencies as required and summarise in the Annual Review.</li> <li>• Review and update the WMP and resubmit to the DPIE (if required).</li> </ul>

MACH Energy commenced stream health monitoring at three additional sites in Spring 2017, including one on Sandy Creek and one on the Hunter River. Mangoola Coal Operations has established stream health trigger levels for monitoring sites on Sandy Creek (refer to Figure 3 of the SWMP). In the event a deterioration in stream health is observed at these locations, MACH Energy would consult with Mangoola Coal Operations during the implementation of their response mechanisms.

<sup>2</sup> There is no corresponding upstream site for site SC. The stream health investigation protocol would be initiated if the stream health indicator at site SC degrades below the specified trigger levels (refer to Table 11 of the SWMP) for two successive monitoring rounds.

### 3.1.3 Surface Water Supply on Privately-Owned Land Response Protocol

A number of privately-owned properties reside along unnamed drainage lines which flow out of the MPO to the east and west of the MPO boundary (Figure 2). MACH Energy has designed the surface water management system to ensure that all discharges from the site are controlled and meet acceptable water quality standards, and to avoid unlicensed discharges of contaminated water (refer Site Water Balance). Notwithstanding, in the event that a surface water-related complaint is received from a local landholder in relation to a potential MPO-related impact on their surface water supply, the response protocol in Table 5 will be initiated.

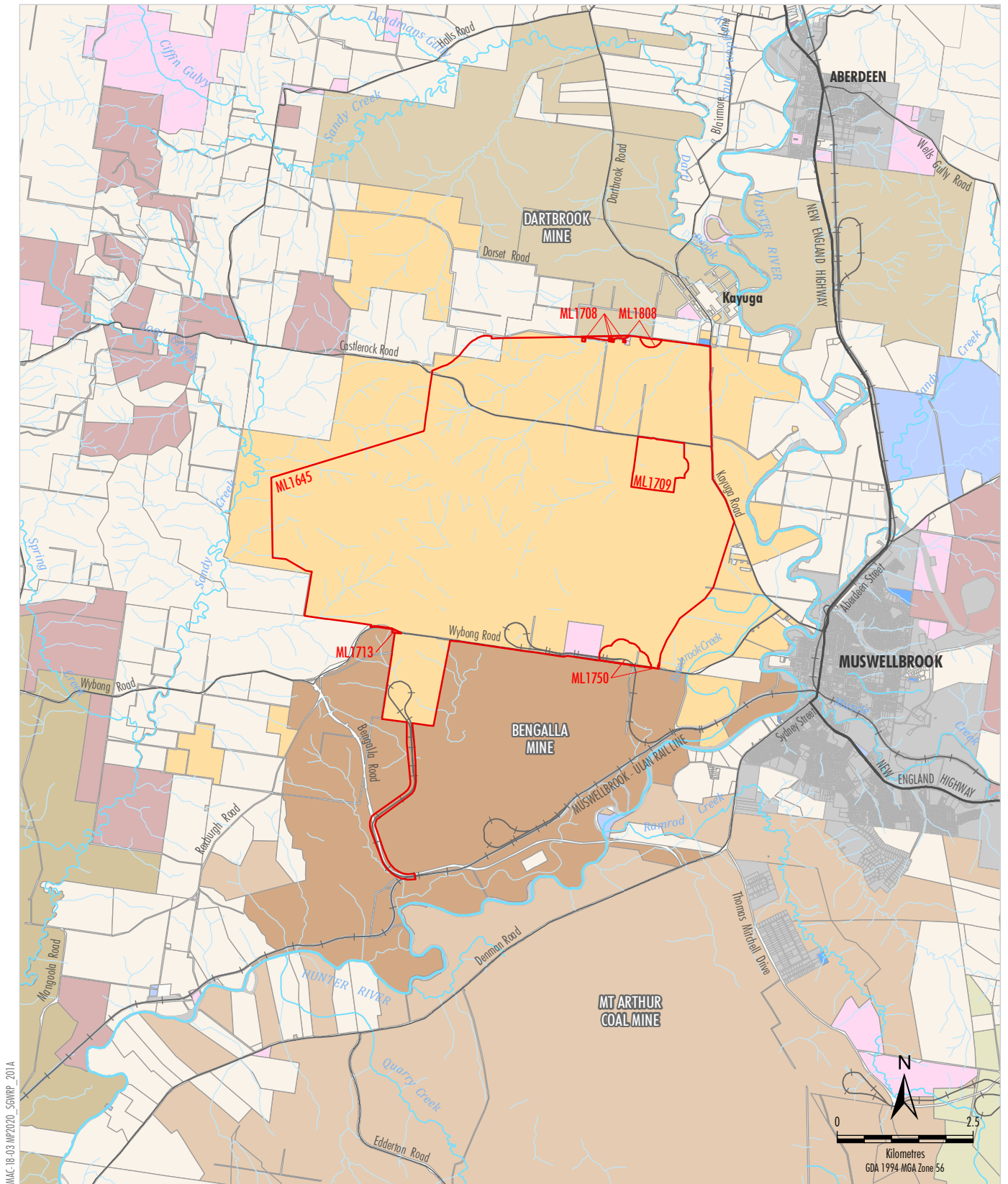
**Table 5**  
**Surface Water Supply Response Protocol**

Response Protocol	
Trigger	Complaint by local landholder regarding surface water supply.
Investigation	<ol style="list-style-type: none"> <li>1. Notify the MACH Energy Environmental Superintendent within 24 hours of receiving the complaint.</li> <li>2. Check and validate the information provided with the complaint.</li> <li>3. Undertake a review of monitoring data.</li> <li>4. Collect and analyse supplementary samples of the exceedance parameter (as well as any other relevant parameters) upstream (where possible) and downstream of the MPO, to assess whether the exceedance is ongoing.</li> <li>5. Assess any changes to MACH Energy activities and inspect all relevant water management structures and infrastructure, and erosion and sediment controls in the area of the complaint.</li> <li>6. Assess conditions (climatic, hydrological, hydrogeological and changes in land use activities in the catchment – including other mining/pastoral activities and riparian revegetation works), both prevailing and preceding the complaint and assess the potential impact.</li> <li>7. Identify plausible and possible causative mechanisms and assess/quantify these against all relevant data and information to identify most likely causes.</li> <li>8. Decide if the impact (i.e. impact on surface water supply) is solely attributable to activities being undertaken by or directly related to the MPO.</li> <li>9. Notify owner of the outcome of the investigation.</li> <li>10. Provide a preliminary investigation report to the DPIE, EPA and DPIE Water within seven days of identifying the trigger exceedance.</li> </ol>
Response	<ul style="list-style-type: none"> <li>• Develop/design contingency and remedial measures based on the results of the above investigations. Contingency and remedial measures considered practical for implementation may include: <ul style="list-style-type: none"> <li>– notifying local landholders;</li> <li>– providing an alternative water source for the duration of water quality impact caused by the incident/non-compliance;</li> <li>– reviewing and refining the SWMP;</li> <li>– reviewing and refining processes for inspection, maintenance and siting of water management infrastructure (e.g. dams, pipelines, pumps);</li> <li>– repairing, replacing, or constructing new or enlarged water management infrastructure; and</li> <li>– developing and implementing a training package specifically related to the cause of the incident/non-compliance.</li> </ul> </li> <li>• Communicate results of investigation, contingency and remedial measures to government agencies as required and summarise in the Annual Review.</li> <li>• Review and update the WMP and resubmit to the DPIE (if required).</li> </ul>

All complaints will be managed in accordance with the complaints procedure outlined in Section 5 of the WMP.

## 3.2 GROUNDWATER INVESTIGATIONS

MACH Energy has developed a groundwater response protocol to ensure all exceedances of groundwater triggers and complaints related to groundwater are appropriately investigated and addressed. These have been incorporated in the individual response protocols provided below.



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**MOUNT PLEASANT OPERATION**  
**Land Ownership Overview**  
**(July 2020)**

**Figure 2**



### 3.2.1 Groundwater Levels Response Protocol

As described in Section 7.1 of the GWMP, final groundwater level trigger values will be based upon the results of contemporary groundwater modelling yet to be completed. In the interim, groundwater level trigger values have been established to monitor for potential impacts on the alluvial groundwater system to the east of the MPO, associated with the Hunter River (this is anticipated to be where the majority of private groundwater users are accessing groundwater in the vicinity of the MPO). Trigger values have been developed in accordance with the *NSW Aquifer Interference Policy*, at three monitoring bores situated in this alluvial groundwater system. In the event that groundwater levels at these bores fall below these trigger values, the response protocol in Table 6 will be initiated.

**Table 6**  
**Groundwater Level Response Protocol**

Response Protocol	
Trigger	A groundwater level measurement at a relevant alluvial monitoring bore falls below the trigger value specified within Table 10 of the GWMP.
Investigation	<ol style="list-style-type: none"> <li>1. Notify the MACH Energy Environmental Superintendent within 24 hours of becoming aware of the trigger event.</li> <li>2. Check and validate the data which indicates an exceedance of the trigger conditions.</li> <li>3. Undertake supplementary water level measurements to check if the exceedance is ongoing.</li> <li>4. Conduct a preliminary investigation, including a review of site activities being undertaken at the time, baseline groundwater monitoring results, groundwater results at nearby locations, the prevailing and preceding meteorological and streamflow conditions and changes to the land use/activities being undertaken in the area, including mining/pastoral activities. If necessary, engage a suitably qualified hydrogeologist to assist with the preliminary investigation (e.g. interpretation of monitoring results).</li> <li>5. Identify plausible and possible causative mechanisms and assess/quantify these against all relevant data and information to identify most likely causes.</li> <li>6. Determine if private groundwater supply bores in the vicinity of the monitoring bore have experienced cumulative drawdowns in excess of 2 metres (m) and an associated reduction in groundwater yield (The minimal impact consideration for privately owned groundwater bores under the <i>NSW Aquifer Interference Policy</i> is drawdowns greater than 2 m).</li> <li>7. Determine if there has been an effect on potential GDEs located along the Hunter River.</li> <li>8. Provide a preliminary investigation report to the DPIE, EPA and DPIE Water within seven days of identifying the trigger exceedance.</li> </ol>
Response	<ul style="list-style-type: none"> <li>• Implement appropriate contingency and remedial measures (including the privately-owned groundwater bores response protocol, if required).</li> <li>• Communicate results of investigation, contingency and remedial measures to government agencies as required and summarise in the Annual Review.</li> <li>• Review and update the WMP and resubmit to the DPIE (if required).</li> </ul>

### 3.2.2 Groundwater Quality Response Protocol

Water quality triggers for groundwater have been developed in accordance with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000). These triggers are based upon exceedance of the assigned beneficial use categories for EC values, and the exceedance/deterioration of pH values outside the 20<sup>th</sup> and 80<sup>th</sup> percentile range of baseline pH data. Details regarding the trigger values are provided in Section 7.2 of the GWMP. In the event that one of the groundwater quality assessment criteria is triggered, the response protocol in Table 7 will be implemented.

**Table 7**  
**Groundwater Quality Response Protocol**

Response Protocol	
Trigger	A monitoring bore records an EC or pH value above (or outside the range of) the trigger values specified in Table 12 of the GWMP at three successive monitoring rounds.
Investigation	<ol style="list-style-type: none"> <li>1. Notify the MACH Energy Environmental Superintendent within 24 hours of becoming aware of the trigger event.</li> <li>2. Check and validate the data which indicates an exceedance of the trigger conditions.</li> <li>3. In the event of an apparently anomalous groundwater monitoring result, conduct a resample/retest.</li> <li>4. Conduct a preliminary investigation, including a review of site activities being undertaken at the time, baseline groundwater monitoring results, groundwater results at nearby locations, the prevailing and preceding meteorological and streamflow conditions and changes to the land use/activities being undertaken in the area, including mining/pastoral activities. If necessary, engage a suitably qualified hydrogeologist to assist with the preliminary investigation (e.g. interpretation of monitoring results).</li> <li>5. Provide a preliminary investigation report to the DPIE, EPA and DPIE Water within seven days of identifying the trigger exceedance.</li> </ol>
Response	<ul style="list-style-type: none"> <li>• Subject to the outcomes of the investigation, develop/design contingency and remedial measures. Contingency and remedial measures considered practical for implementation may include: <ul style="list-style-type: none"> <li>– notification to local groundwater users;</li> <li>– providing an alternative water source for the duration of the water quality impact;</li> <li>– reviewing and refining the Ground Water Monitoring Program including undertaking additional specific monitoring of private landholder bores;</li> <li>– reviewing mine plan impacts on the alluvial groundwater source; and</li> <li>– repairing, replacing, or constructing new water management infrastructure.</li> </ul> </li> <li>• Communicate results of investigation, contingency and remedial measures to government agencies as required and summarise in the Annual Review.</li> <li>• Review and update the WMP and resubmit to the DPIE (if required).</li> </ul>

### 3.2.3 Privately-Owned Groundwater Bores Response Protocol

In the event that a groundwater-related complaint is received from a local landholder in relation to a potential mine-related effect on their groundwater supply, or an investigation undertaken in accordance with the response protocol in Table 6 indicates a drawdown of greater than 2 m at a privately owned bore, the response protocol in Table 8 will be initiated.

In addition, all complaints will be managed in accordance with the complaint protocols outlined in Section 5 of the WMP.

**Table 8**  
**Privately-Owned Groundwater Bores Response Protocol**

Response Protocol	
Trigger	Complaint by local landholder regarding water supply from groundwater bore.
Investigation	<ol style="list-style-type: none"> <li>1. Notify the MACH Energy Environmental Superintendent within 24 hours of receiving the complaint.</li> <li>2. Check and validate the information provided with the complaint.</li> <li>3. Conduct a preliminary investigation, including a review of site activities being undertaken at the time, baseline groundwater monitoring results, groundwater results at nearby locations, the prevailing and preceding meteorological and streamflow conditions and changes to the land use/activities being undertaken in the area, including mining/pastoral activities. If necessary, engage a suitably qualified hydrogeologist to assist with the preliminary investigation (e.g. interpretation of monitoring results).</li> <li>4. Where a preliminary investigation indicates a potential mining effect at the complainant's bore, conduct a detailed investigation to determine whether the MPO has contributed to a greater than 2 m cumulative drawdown or a detrimental water quality effect.</li> </ol>
Response	<ul style="list-style-type: none"> <li>• In the event that a detailed investigation conclusively attributes greater than 2 m drawdown, or a detrimental water quality effect, for an existing groundwater supply user to the MPO (or a contribution from the MPO to a cumulative 2 m drawdown or cumulative detrimental water quality effect), investigate appropriate contingency and remedial measures which may include: <ul style="list-style-type: none"> <li>– deepening the affected groundwater supply bore;</li> <li>– construction of a new groundwater supply bore; or</li> <li>– provision of an alternative water supply.</li> </ul> </li> <li>• Determine the exact nature of contingency/remedial measures in consultation with the affected landholder (and relevant regulatory agencies as required). Where a cumulative impact is identified, the costs associated with the contingency/remedial measures will be apportioned to the responsible parties based on their relative contribution to the identified impact.</li> <li>• Communicate results of investigation, contingency and remedial measures to government agencies as required and summarise in the Annual Review.</li> <li>• Review and update the WMP and resubmit to the DPIE (if required).</li> </ul>

## **4 POTENTIAL CONTINGENCY MEASURES**

### **4.1 LOSS OF BASEFLOW**

Potential impacts to Hunter River baseflow were considered as part of the Mt Pleasant Water Management Studies (PPK Infrastructure and Environment, 1997).

PPK Infrastructure and Environment (1997) concluded that a minor reversal in flow, resulting in downward leakage from the alluvium to the hard rock, would be offset by natural groundwater recharge. Accordingly, the water table within the alluvial sediments was predicted to remain largely unaffected by depressurisation and the impacts on Hunter River water supply were therefore predicted to be negligible.

Notwithstanding, contemporary groundwater modelling is being undertaken for the MPO. This contemporary groundwater modelling will include updated predictions of Hunter River baseflow loss due to the approved MPO.

Any incidental water take from the Hunter River would be licensed in accordance with requirements of the *Water Management Act, 2000*. Unnamed drainage lines in the MPO vicinity are unlikely to receive any significant baseflow given their ephemeral nature. On this basis, further measures to offset the loss of any baseflow to watercourses is not considered to be warranted.

### **4.2 GROUNDWATER LEAKAGE FROM ALLUVIAL AQUIFERS**

HydroSimulations (2016) has undertaken a desktop review of a number of groundwater studies in order to conservatively estimate the MPO groundwater pit inflows and associated alluvial groundwater licensing requirements (refer to Section 6.1.1 of the GWMP).

Groundwater leakage from alluvial aquifers will be licensed in accordance with requirements of the *Water Management Act, 2000*. On this basis, further measures to prevent, minimise or offset groundwater leakage from alluvial aquifers due to the MPO are not considered warranted.

### **4.3 ADVERSELY AFFECTED WATER SUPPLY ON PRIVATELY-OWNED LAND**

Response protocols have been developed for potential impacts on privately-owned surface water and groundwater users (Sections 3.1.3 and 3.2.3).

The *NSW Aquifer Interference Policy* includes minimal impact considerations relating to water table and groundwater pressure drawdown. The minimal impact consideration for privately owned groundwater bores is cumulative drawdowns greater than 2 m. In the event the MPO contributed to a drawdown greater than 2 m at a private bore was attributed to the MPO, and this has negative impacts on the landholder's water supply, the following potential make-good provisions may be implemented:

- deepening the affected groundwater supply bore;
- construction of a new groundwater supply bore; or
- provision of an alternative water supply.

If an unapproved, adverse impact occurs on a downstream surface water user due to the MPO, MACH Energy would implement the following contingency measures:

- providing an alternative water source during the duration of the impact; and
- reviewing and refining the surface water and groundwater monitoring programs.

These contingency measures would be assessed on a case by case basis and implemented in consultation with the affected landholder.

#### 4.4 ADVERSELY AFFECTED GROUNDWATER DEPENDENT ECOSYSTEMS AND RIPARIAN VEGETATION

Review of the relevant water sharing plans has indicated that there are no high priority groundwater dependent ecosystems (GDEs) in the vicinity of the MPO.

GDEs are likely restricted to the trees on the bank of the Hunter River, with the historic GDE vegetation on the main floodplain out from the river banks having been cleared for farming. Accordingly, the triggers established for alluvial groundwater levels are considered to be sufficient for monitoring potential effects on GDEs (refer to Section 7.3 of the GWMP).

As described in Section 4.3 of the SWMP, the Hunter River and its tributaries have been historically degraded due to agricultural and industrial use. Riparian condition at all four stream health monitoring locations was described as poor, with the majority of native flora species at the sites being replaced by exotic species (Hose and Turak, 2004).

Notwithstanding the above, a stream health monitoring program has been developed to detect any changes in macro invertebrate ecology in the vicinity of the MPO. This monitoring program includes macro invertebrate sampling at two downstream monitoring locations on the Hunter River, in the vicinity of the MPO.

In addition to aquatic macro invertebrate sampling, monitoring will also include:

- fish observations;
- site water quality;
- stream condition; and
- aquatic and riparian edge plants.

In the event that deterioration is identified in GDEs or in riparian vegetation condition during stream health monitoring, the response protocol outlined in Table 9 will be initiated.

**Table 9**  
**Groundwater Dependent Ecosystems and Riparian Vegetation Condition Response Protocol**

Response Protocol	
Trigger	Detection of deterioration in GDEs or riparian vegetation along watercourses in the vicinity of the MPO.
Investigation	<ol style="list-style-type: none"> <li>1. Notify the MACH Energy Environmental Superintendent within 24 hours of becoming aware of the deterioration.</li> <li>2. Check and validate the data/information which indicates an impact.</li> <li>3. In the event of an apparently anomalous monitoring result, conduct a resample/retest where possible.</li> <li>4. Review the impact, including consideration of: <ul style="list-style-type: none"> <li>– any relevant monitoring data; and</li> <li>– current mine activities and land management practices in the relevant catchment, including other mining/pastoral activities.</li> </ul> </li> <li>5. Commission an investigation by an appropriate specialist into the impact, if considered appropriate by the Environmental Superintendent.</li> <li>6. Provide a preliminary investigation report to the DPIE, EPA and DPIE Water within seven days of identifying the trigger exceedance.</li> </ol>
Response	<ul style="list-style-type: none"> <li>• Develop appropriate contingency/remedial measures based on the results of the above investigations, in consultation with the relevant authorities if or as required.</li> </ul>



## **5 REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE**

### **5.1 ANNUAL REVIEW**

In accordance with Condition 3, Schedule 5 of Development Consent DA 92/97 MACH Energy will review and evaluate the environmental performance of the MPO by the end of March each year (for the preceding calendar year) or other such timing as agreed by the Secretary of the DPIE.

In relation to water, the Annual Review will:

- include a review of the surface and groundwater monitoring results at the MPO over the past year, which includes a comparison of the results to evaluate compliance against the:
  - relevant statutory requirements, limits or performance measures/criteria (refer Section 2.1.1);
  - monitoring results of the previous years; and
  - relevant predictions in the EIS and MOD 1, MOD 2, MOD 3 and MOD 4 EAs;
- identify any water-related non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the water monitoring data over the life of the MPO;
- identify any discrepancies between the predicted and actual water impacts of the MPO, and analyse the potential cause of any significant discrepancies; and
- describe what water-related measures will be implemented over the next year to improve the environmental performance of the MPO.

The Annual Review will be made publicly available on the MACH Energy website (<http://www.machenergyaustralia.com.au>) in accordance with Condition 11, Schedule 5 of Development Consent DA 92/97.

### **5.2 SGWRP REVISION**

In accordance with Condition 4, Schedule 5 of Development Consent DA 92/97, this SGWRP will be reviewed, and if necessary revised to the satisfaction of the Secretary of the DPIE, within three months of the submission of:

- an Annual Review (Condition 3, Schedule 5);
- an incident report (Condition 7, Schedule 5);
- an Independent Environmental Audit (Condition 9, Schedule 5); and
- any modification to the conditions of Development Consent DA 92/97.

Within 4 weeks of conducting any such review, the Secretary of the DPIE will be advised of the outcomes of the review and any revised documents submitted to the Secretary for approval.

In accordance with Condition 4A, Schedule 5 of Development Consent DA 92/97, MACH Energy may submit a revised SGWRP for the approval of the Secretary at any time, and may also submit any revision to this SGWRP required under Development Consent DA 92/97 on a staged basis.

If agreed with the Secretary of the DPIE, a revision to this SGWRP required under Development Consent DA 92/97 may be prepared without undertaking consultation with all parties nominated under the relevant Condition of Development Consent DA 92/97.

The approved SGWRP will be made publicly available on the MACH Energy website (<http://www.machenergyaustralia.com.au>), in accordance with Condition 11, Schedule 5 of Development Consent DA 92/97.

## **6 REPORTING PROCEDURES**

In accordance with Condition 2, Schedule 5 of Development Consent DA 92/97, MACH Energy has developed protocols for managing and reporting the following:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria.

These protocols are described in Section 5 of the WMP.

In accordance with Condition 8, Schedule 5 of Development Consent DA 92/97, MACH Energy will provide regular reporting on the environmental performance of the MPO on the MACH Energy website (<http://www.machenergyaustralia.com.au>).

## 7 REFERENCES

- Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.
- EMGA Mitchell McLennan (2010) *Mount Pleasant Project Modification Environmental Assessment Report*. Prepared for Coal and Allied Operations Pty Limited.
- Environmental Resources Management (ERM) Mitchell McCotter (1997) *Mount Pleasant Operation Environmental Impact Statement*.
- Hose, G. and Turak, E. (2004) *River Health in the New South Wales Lower North Coast, Hunter and Central Coast Catchments*. Report prepared for the NSW Environmental Protection Authority.
- HydroSimulations (2016) *Mt Pleasant Project – Groundwater Inflow and Licensing Estimates*.
- MACH Energy (2017a) *Mount Pleasant Operation (DA 92/97) – South Pit Haul Road Modification*.
- MACH Energy (2017b) *Mount Pleasant Operation – Mine Optimisation Modification Environmental Assessment*.
- MACH Energy (2017c) *Mount Pleasant Operation – Rail Modification Environmental Assessment*.
- PPK Environment & Infrastructure (1997) Water Management Studies. Supplementary Report 3 in *Mt Pleasant Mine Environmental Impact Statement*.

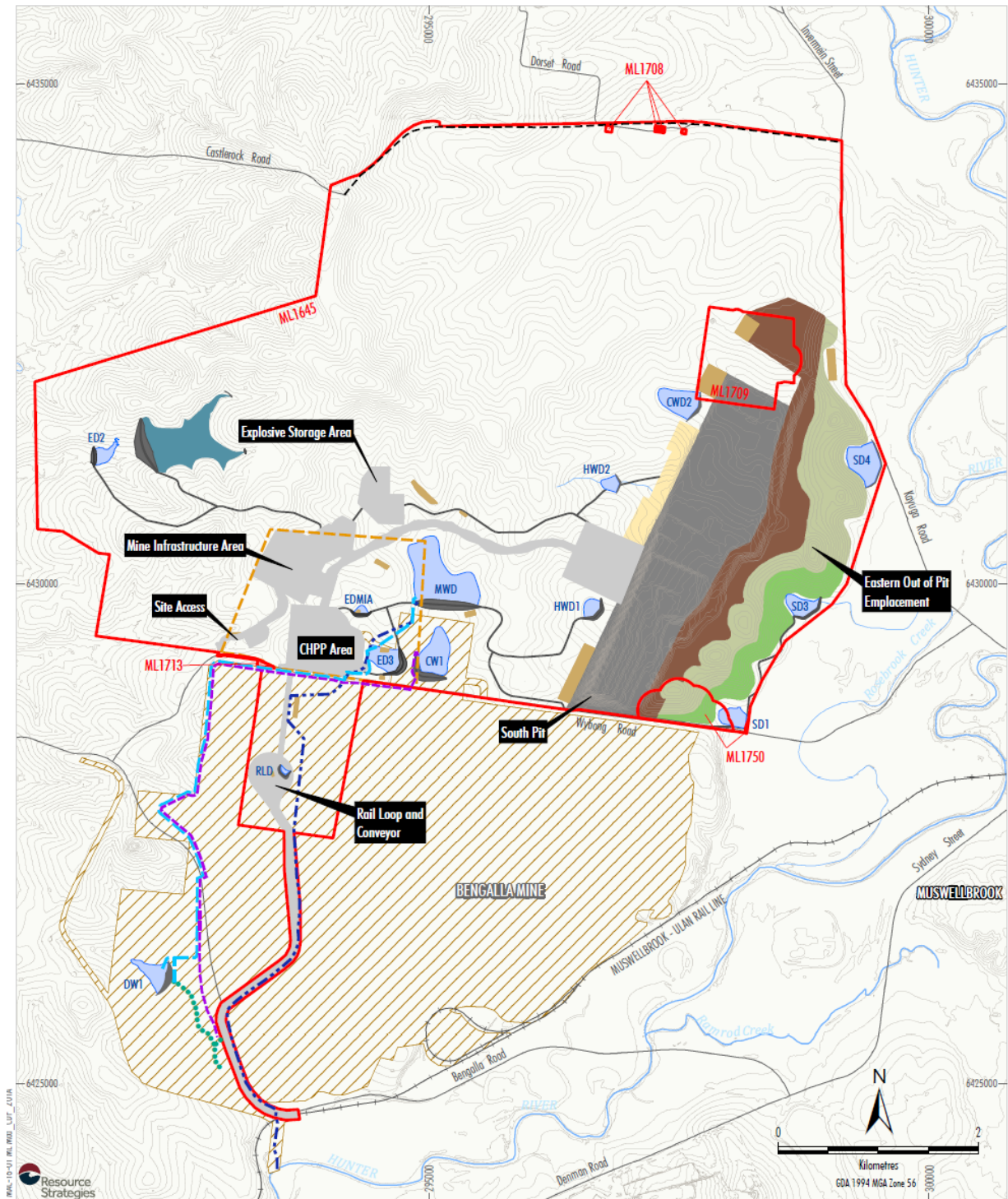
**ATTACHMENT 1**

**APPENDIX 2 OF DEVELOPMENT CONSENT DA 92/97**



## APPENDIX 2

### FIGURE 1 - CONCEPTUAL PROJECT LAYOUT PLAN AT 2021



- LEGEND**
- Mining Lease Boundary
  - Bengalla Mine Approved Disturbance Boundary (SSD-5170)
  - Infrastructure Area Envelope
  - Active Stripping Area
  - Active Mining Area
  - Active Overburden Emplacement Area
  - Topsoil Stockpile
  - Initial Rehabilitation
  - Established Rehabilitation
  - Infrastructure and Borrow/Stockpile Area
  - Access Road
  - Northern Link Road
  - Indicative Water Pipeline Alignment
  - MPO Hunter River Supply Pipeline
  - MPO DW1 Pipeline (Bi-directional)
  - Bengalla Mine CW1 Pipeline
  - Approximate Extent of Scour Protection
  - Water Dam
  - Fines Emplacement Area

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2017)

**MACHEnergy**  
MOUNT PLEASANT OPERATION



**FIGURE 2 - CONCEPTUAL PROJECT LAYOUT PLAN AT 2025**





**FIGURE 3 - APPROVED SURFACE DISTURBANCE PLAN**

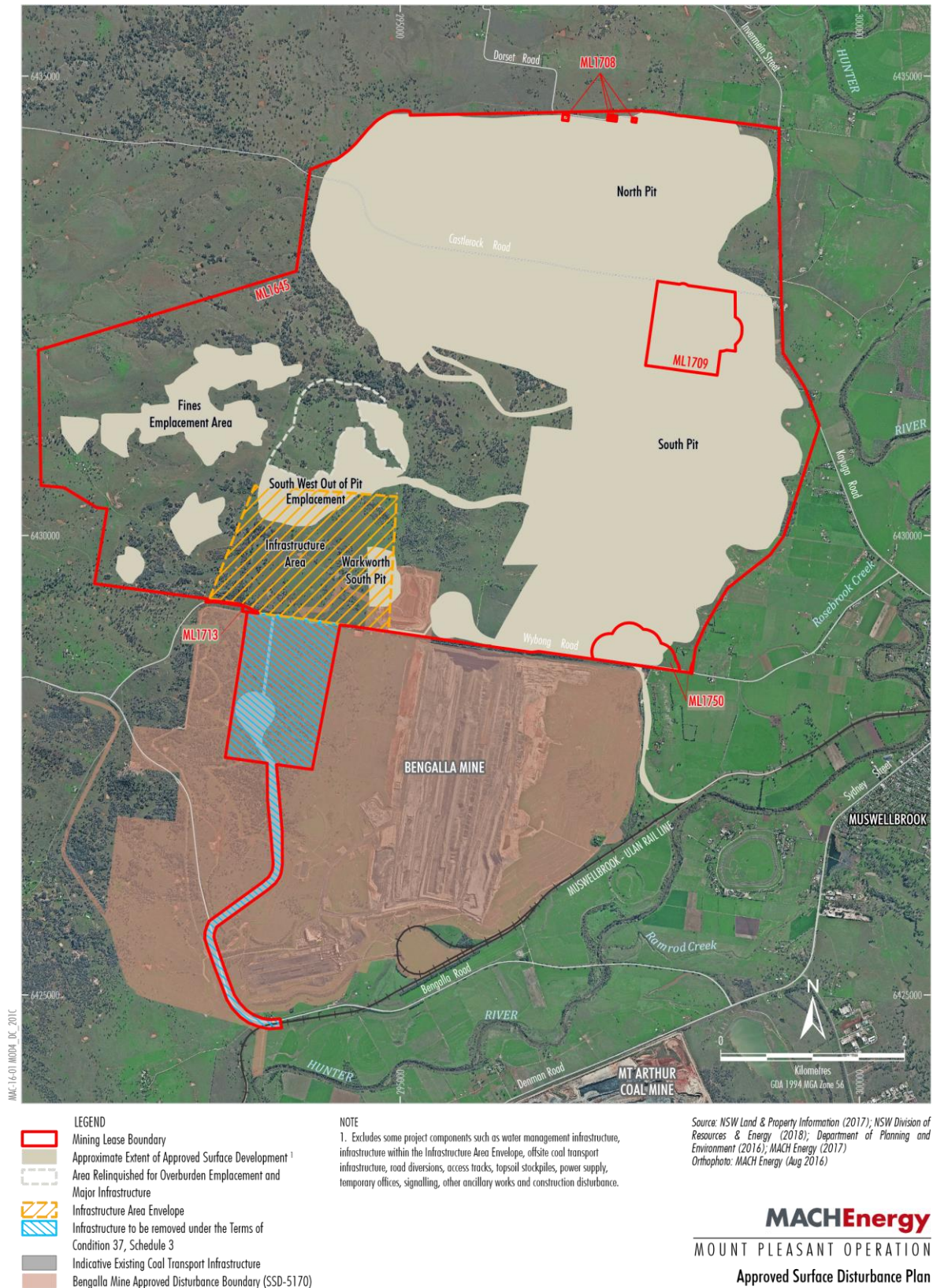




FIGURE 4 - CONCEPTUAL FINAL LANDFORM

