

# Phase 2 Clean-Up Options Evaluation Report and Clean-Up Protocol



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## Phase 2 Clean-Up Options Evaluation Report and Clean-Up Protocol

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WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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# Abbreviations

BAPL	BIO-ANALYSIS Pty Limited
CCL	Consolidated Coal Lease
EPL	Environment Protection Licence
HCPL	Helensburgh Coal Pty Limited
MCPL	Metropolitan Coal Pty Limited
ML	Mine Lease
NSW EPA	New South Wales Environment Protection Authority
Peabody	Peabody Australia Pty Ltd
PCT	Plant Community Types
PMST	Protected Matters Search Tool
EPBC Act	Environment Protection and Biodiversity Conservation Act
BC Act	Biodiversity Conservation Act
WHSE	Work Health Safety and Environment
NPWS	National Parks and Wildlife Services
WH&S	Work Health and Safety
HSEP	Health, Environmental and Safety Plan
SWMS	Safe Work Method Statement
PPE	Personal Protective Equipment
pH	Potential Hydrogen
EC	Electrical Conductivity
TSS	Total Soluble Salts
EP&A Act	Environmental Planning and Assessment Act 1979
REF	Review of Environmental Factors
DPE	Department of Planning and Environment
DPI Fisheries	Department of Primary Industries Fisheries
EES	Environment, Energy and Science
LALC	Local Aboriginal Land Council

# 1 Project background

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## 1.1 Introduction

The Metropolitan Coal Mine (Metropolitan Coal) is owned and operated by Helensburgh Coal Pty Ltd which is a wholly owned subsidiary of Peabody Energy Australia Pty Ltd (Peabody). It is located adjacent to the township of Helensburgh and approximately 30 km north of Wollongong in New South Wales (NSW) (refer Figure 1.1, Section 1.4).

Metropolitan Coal is located within Consolidated Coal Lease (CCL) 703, Mining Lease (ML) 1610 and ML 1702. Metropolitan Coal is one of the earliest established and longest continually running coal mining operations in Australia, with a history dating back to the 1880s. Metropolitan Coal was granted approval (08-0149) for the Metropolitan Coal Project (the Project) by the Minister for Planning under section 75J of the *NSW Environmental Planning and Assessment Act, 1979 (EP&A Act)* on 22 June 2009.

The Project comprises the continuation, upgrade and extension of underground coal mining operations and surface facilities at Metropolitan Coal. The Project involves the extraction of coal by longwall mining methods from the Bulli Seam. The potential environmental consequences of the Project were assessed in the Metropolitan Coal Project Environmental Assessment (the Project EA) (Helensburgh Coal Pty Ltd [HCPL], 2008) and the Metropolitan Coal Project Preferred Project Report (the Preferred Project Report) (HCPL, 2009).

The Mine Site operates under approval 08-0149 and Environment Protection Licence (EPL) No: 767. The licence (EPL 767<sup>1</sup>) allows for the discharge of stormwater to Camp Gully Creek following treatment through the Mine site wastewater treatment facility. Stormwater storage is managed on the Mine Site within: two large and one small storage ponds identified as the Sedimentation Pond (SP1), located west of the coal stockpile area; and Turkeys Nests 1 (SP2) and 2 (SP3), located along the eastern boundary of the coal stockpile area. Stormwater collected at the Mine Site is recirculated through the washery and the ponds with surplus water treated prior to discharge to Camp Gully Creek.

Above average rainfalls have been experienced within the general area, including the Sydney Basin. As a result of prolonged and heavy rainfall the Mine site stormwater management system has been overwhelmed resulting in untreated stormwater entering Camp Gully Creek.

The New South Wales Environment Protection Authority (NSW EPA) issued a Penalty Notice for a blockage and stormwater system in March 2022. Metropolitan Collieries Pty Limited (MCPL) has commenced civil works to improve the stormwater system with works expected to be completed by December 2022.

The NSW EPA carried out a Mine Site inspection on the 17 August 2022 and observed fine coal material located off-site within the creek bed and embankment of Camp Gully Creek.

The NSW EPA issued a Variation to the EPL (Notice Number 1621831) with special Conditions (E1) requiring all reasonable efforts be made to recover the material, in a manner that will not damage the bed or banks or cause deterioration of water quality. The NSW EPA also issued a Prevention Notice (Notice Number 3503648) on 9 September 2002 relating to water management practices on the Mine Site.

In response to the Licence condition E1, MCPL engaged BIO-ANALYSIS Pty Ltd (BAPL) to prepare Clean-up Protocol (Phase 1) prior to remediation works commencing (BAPL, 2022). The Clean-up Protocol responds to NSW EPA Clean Up Notice Number 3503716, dated 16 September 2022, which required Phase 1 works to commence by 20 September 2002. The Notice also required consideration to be given to the engagement of consultants to develop a program of Phase 2 Clean-Up works.

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<sup>1</sup> The licensee is listed as Metropolitan Collieries Pty Limited (MCPL).



A second Clean-Up Notice (Number 3503769) issued on 30 September 2022 details the requirements of the Phase 2 Clean-Up Protocol. Specifically, the Notice reiterates the required Phase 1 Clean-Up actions and the requirement to prepare this Phase 2 Clean-Up Evaluation Report and include Phase 2 Clean-Up Protocols herein.

Peabody has commenced Phase 1 clean-up protocols in accordance with the initial Clean-up Notice and the BAPL (2022) Camp Gully Creek Clean-Up Protocol requiring Peabody to undertake removal of residual coal material downstream of the site between the embankment and within 100 mm of the waterline.

These works are currently limited to areas above the water line and the exposed creek embankments within Camp Gully Creek between the operational area of the Mine Site and McKinnon Gully (Refer to Section 3).

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## 1.2 Report scope

The scope of this Phase 2 Clean-Up Options Evaluation Report and Clean-Up Protocol includes:

- review of the environmental setting of the Remediation Site including the local water quality and flora and fauna
  - visual assessment and description of the extent of coal material deposited within Camp Gully Creek and Hacking River associated with the recent release
  - identification and assessment of viable potential remedial options that could be implemented to address areas of recently accumulated coal material observed below the water line. This review will draw on the findings from the works completed as part of the Phase 1 Clean-Up
  - recommendation of preferred remedial option and identification of associated consultation and approvals processes
  - development of Stage 2 clean-up protocols and validation criteria to assess the success of clean-up works
  - definition of environmental management controls during the proposed works
  - resourcing and delivery schedule for implementation of Phase 2 Clean-Up
  - supervision and reporting requirements for the Phase 2 Clean-Up works.
- 

## 1.3 Regulatory context

As detailed in Section 1 Peabody undertakes mining operations in accordance with the Site Project Approval (08-0149) and Environment Protection License (EPL 737).

This Phase 2 Clean-Up Options Evaluation Report has been prepared and will be implemented in accordance with the Clean-up Notice (3503769, REG-3251) issued by NSW EPA on 30 September 2022. Refer to Appendix A.

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## 1.4 Phase 2 Remediation Site definition

The Phase 2 Remediation Site (as shown in Figure 1.1 to Figure 1.3) is defined as:

- Camp Gully Creek between embankments and including the bed of the creek, extending from the licensed discharge point to the confluence with the Hacking River
- Hacking River between the embankments and including the bed of the river from the confluence with Camp Gully Creek extending in the first instance to Red Cedar Campgrounds.
- Hacking River between the embankments and including the bed of the river from Red Cedar Campgrounds to McKell Avenue intersection.

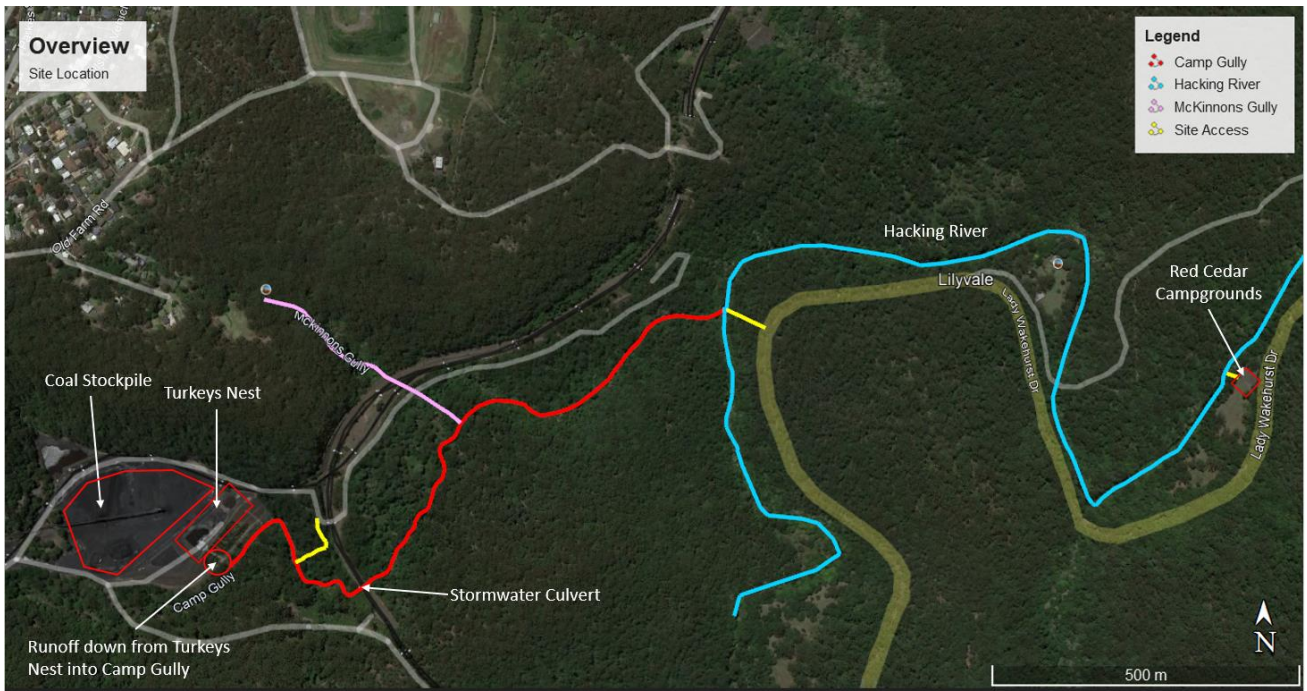


Figure 1.1 Phase 2 Remediation Site – Camp Gully / Hacking River

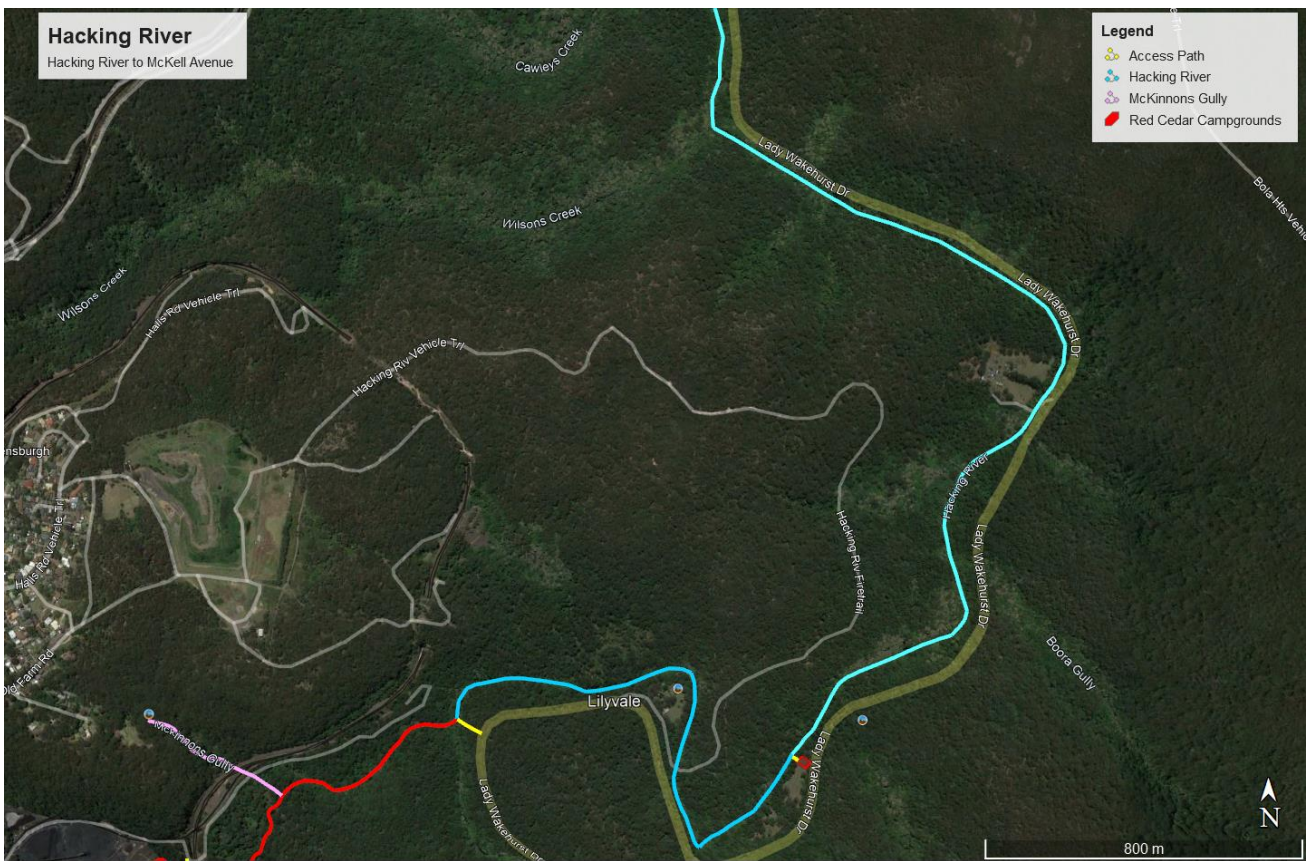


Figure 1.2 Phase 2 Remediation Site – Hacking River from Red Cedar Campgrounds



Figure 1.3 Phase 2 Remediation Site – Hacking River to McKell Ave

## 2 Review of available information

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### 2.1 Discharge events

There have been three uncontrolled discharge events from the Metropolitan Mine Site reported by Peabody to the NSW EPA as follows:

- In March 2022, as a result of a blockage within onsite stormwater management pipework, coal sediment laden stormwater was discharged to Camp Gully Creek following extended and heavy rainfall.
  - Between 3–4 July and sometime between the 2 and 8 September 2022, coal sediment laden stormwater was discharged to Camp Gully Creek due to extended and heavy rainfall which resulted in excess water being discharged from the Turkeys Nest.
- 

### 2.2 Remediation site environmental setting

#### 2.2.1 Plant community types

The following Plant Community Types (PCT) are present along and adjacent to Camp Gully Creek:

- 1 PCT 3028: Illawarra Escarpment Warm Temperate Rainforest
- 2 PCT 3154: Illawarra Blackbutt Moist Forest
- 3 PCT 3153: Illawarra Escarpment Bangalay × Blue Gum Wet Forest.

The Illawarra Escarpment Warm Temperate Rainforest is restricted to the edges of Camp Gully along the drainage line and lower slopes. The vegetation on the slopes above the rainforest consists of a mix of Illawarra Blackbutt Moist Forest and Illawarra Escarpment Bangalay × Blue Gum Wet Forest. The Plant Community Types present along Camp Gully are illustrated in Photo 2.1 to Photo 2.4 (below).

While quantitative data on vegetation integrity was not collected during the site walkover, these three Plant Community Types can be expected to be in or near benchmark condition with the exception of small areas directly adjacent to the rail embankments which contain significant growth of weed species notably *Lantana camara*.



Photo 2.1 PCT3028: Illawarra Escarpment Warm Temperate Rainforest at the edge of Camp Gully



Photo 2.2 PCT3028: Illawarra Escarpment Warm Temperate Rainforest up slope of Camp Gully



Photo 2.3 PCT 3154: Illawarra Blackbutt Moist Forest on the upper slope north of Camp Gully



Photo 2.4 PCT 3153: Illawarra Escarpment Bangalay x Blue Gum Wet Forest on the north facing slopes adjacent to Camp Gully

### 2.2.2 Threatened ecological communities

The native vegetation along Camp Gully and the Hacking River does not meet the final determination of any threatened ecological communities listed under the *BC<sup>2</sup> Act* or *EPBC Act<sup>3</sup>*.

### 2.2.3 Threatened flora species

A search of the BioNet Atlas indicates that 18 threatened plant species have previously been recorded within 10 km of the discharge point from the Mins Site Turkeys Nest, along Camp Gully Creek to the confluence with the Hacking River.

The *EPBC Act* Protected Matters Search Tool (PMST) indicates that there are 26 threatened plant species that are known to occur or are considered as having potential to occur based on modelled habitat.

Of these threatened species returned from the database searches, *Rhodamnia rubescens* listed as Critically Endangered under the *BC Act* and *EPBC Act* is the most likely to occur in the habitats along Camp Gully. There is also likely to be suitable habitat for the threatened plants *Arthropteris palisotii*, *Cynanchum elegans*, *Rhizanthella slateri* and *Solanum celatum* in Camp Gully.

The Vulnerable fungus species *Hygrocybe reesiaae* is also known to be associated with PCT3028: Illawarra Escarpment Warm Temperate Rainforest and the habitat in Camp Gully appears to be suitable for *Hygrocybe* species based on the site walkover (based on similar habitats where threatened species of *Hygrocybe* are known to occur in other parts of the Sydney Basin). There may also be habitat for the Endangered moss species *Calomnion complanatum* in PCT3028: Illawarra Escarpment Warm Temperate Rainforest along Camp Gully.

<sup>2</sup> Biodiversity Conservation Act 2016

<sup>3</sup> Environment Protection and Biodiversity Conservation Act 1999

#### 2.2.4 *Threatened fauna species*

A search of the BioNet Atlas indicates that 59 threatened animal species have previously been recorded within 10 km of the discharge point from the Mine Site Turkeys Nest, along Camp Gully Creek to the confluence with the Hacking River. This includes 35 birds, 17 mammals, four frogs and three reptiles.

The *EPBC Act* Protected Matters Search Tool (PMST) indicates that there are 69 threatened animal species that are known to occur or are considered as having potential to occur based on modelled habitat. This includes 39 birds, 13 mammals, five frogs, six reptiles, five fish, and one insect.

The habitat along Camp Gully is high quality and contains a full suite of habitat features typical of relatively undisturbed rainforest habitats common to the Sydney Basin. Of these species returned from the database searches, Camp Gully is most likely to provide habitat for threatened fauna species including:

- birds such as Sooty Owl and Powerful Owl
- mammal species including Greater Glider, Yellow-bellied Glider, Spotted-tail Quoll, and Eastern Pygmy-possum
- frogs including Giant Burrowing Frog, Red-crowned Toadlet and Stuttering Frog.

#### 2.2.5 *Aquatic habitat and species*

The *EPBC Act* Protected Matters Search Tool (PMST) indicates that there are five fish species that are known to occur or are considered as having potential to occur based on modelled habitat. Four of these fish species are however marine or estuarine so would not occur in Camp Gully. One species, Australian Grayling, may occur in Camp Gully.

Based on a review of the NSW DPI Fisheries Spatial Data Portal, Camp Gully is mapped as Key Fish Habitat. The Freshwater Threatened Species mapping indicates that Camp Gully is not known habitat for listed fish species.

Based on the site walkover the aquatic habitats of Camp Gully appear to be in good condition. The creek is natural apart from one location at the rail tunnel where the creek bed is concreted. The creek banks are covered in relatively undisturbed native vegetation (see Photo 2.5). The creek banks are fully stabilised by trees, shrubs and rocks. Channel form is typical of a rocky sandstone stream in the Sydney Basin. There was frequent alternation of riffles and pools providing a variety of instream habitats (see Photo 2.6). The creek contains many natural retention devices including large boulders and rocks (logs were minimal due to recent heavy flows). Sediment accumulation was evident in some locations with sand beds and gravel bars. The stream bottom was generally composed of clean stones with obvious interstices and some areas of clean sand beds. The water in the stream itself was clear and had limited macrophyte or algal growth. Large crayfish were observed in the pools of Camp Gully during the site walkover indicating that the stream health is good (decapods such as crayfish are known to be sensitive to contamination in freshwater bodies and are closely linked with the health of the system).



Photo 2.5 The aquatic habitat at Camp Gully showing natural vegetation and in stream rocky habitat



Photo 2.6 Pool and riffle sequence in Camp Gully showing clear water and boulders

# 3 Phase 1 clean-up protocols

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## 3.1 Clean-up protocols (Phase 1)

As stated in Section 1.0, BAPL were engaged by Peabody to develop clean-up protocols in response to NSW EPA Clean-up Notice (3503716, REG-3216) issued on 16 September 2022.

Initial works were required to focus on concentrated areas immediately downstream of the discharge point from the Mine Site Turkeys Nest, along Camp Gully Creek to the confluence with the Hacking River some 1200 m downstream of the Mine Site discharge point.

Phase 1 protocols were limited to the manual excavation and removal of coal material observed on the banks and areas of exposed creek bed where coal material had accumulated. Works are limited to areas above the water line and the exposed embankment within Camp Gully Creek between the operational area and McKinnon Gully.

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## 3.2 Works completed to date

Following approval of the Phase 1 Clean-up Protocol (BAPL, 2022), Peabody mobilised its workforce and subcontractors on or about Wednesday 21 September 2022.

At the time of preparation of this Report, works had progressed to approximately 600 m downstream of the culvert with approximately 8 tonnes of material removed from the creek bed. Further progress has been hindered due to ongoing rainfall which has restricted the safe and efficient accessing of the creek bed.



Photo 3.1 Water Quality Monitoring downstream of Phase 1 work area

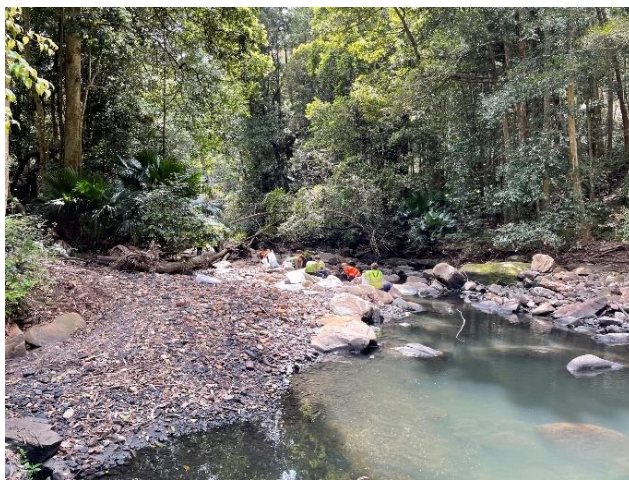


Photo 3.2 Work crews collecting coal sediment from the exposed embankment downstream of Stormwater Culvert





Photo 3.3 Work crew removing accumulated coal sediment from the creek floor

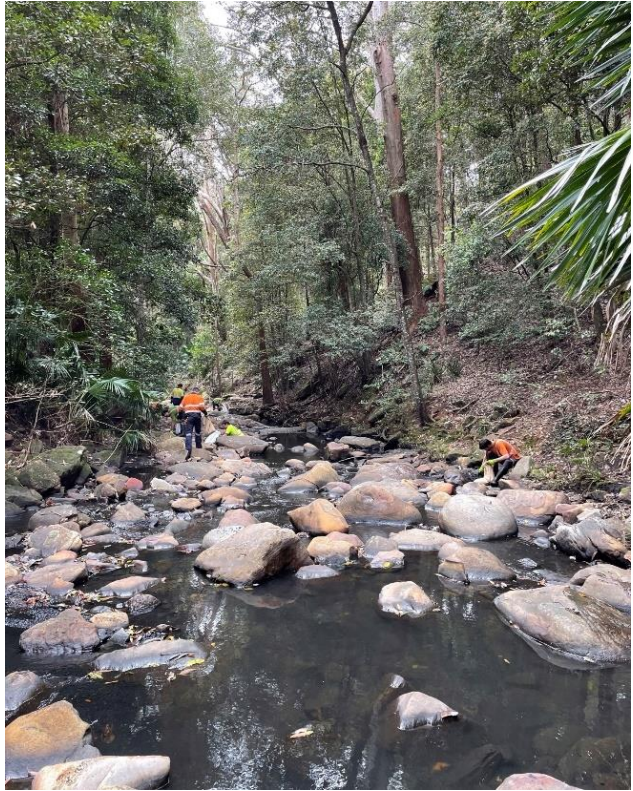


Photo 3.4 Work crews removing coal sediment amongst creek bed structure

# 4 Assessment of Phase 2 extent of impact

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## 4.1 Remediation site walkover assessment

Multiple Remediation Site walkovers have been undertaken by WSP personnel during the period 20 September to 4 October 2022 in response to ongoing rainfall and changes in accessibility to the creek embankments and riverbed. Site walkovers were completed by several personnel from WSP including a Principal Environmental Scientist, a Senior Environmental Scientist, a Principal Ecologist, and a Civil Engineer.

As noted above access to some sections of the creek/river were hindered due to flow and water levels at the time of the inspections.

At the time of the inspections Phase 1 clean-up protocols were in progress and were being undertaken by mine workers under supervision of BAPL along Camp Gully Creek between the Turkeys Nest and McKinnon Gully.

The area inspected is presented in Figure 4.1 to Figure 4.4 presented below.

The South Coast railway line extends along the eastern boundary of the Mine Site and operational area. Camp Gully creek flows beneath the railway corridor via a brick lined culvert which also provides an access route for the mine workers completing the Phase 1 Clean-Up to transport bags of collected coal and sediment to the stockpile area located in the Mine Site. The culvert poses a Work Health Safety and Environment (WHSE) risk due to algae growth on the painted concrete surface, which has created a slip hazard.

Coal deposits and accumulated fines observed along Camp Gully were recorded as like those observed along the Hacking River. It was noted, however, that minimal deposits were observed along the Hacking River and near the Red Cedar Campgrounds.

The WSP assessment team collected photographic examples of a range of coal deposits observed in the creek bed with the intention of grouping similar deposition scenarios and then formulating remedial options for each specific scenario encountered.

Camp Gully is accessible from the Mine Site with light vehicle access possible to the edge of the creek with further access limited to pedestrian traffic.

At the time of inspections, mine workers were carrying collected coal fines and sediments in bags to the bottom of the vehicle access point for transfer via front loader machine to a stockpile area within the operational area of the Mine Site. Access constraints for equipment in and out of Camp Gully from the Mine Site presents limitations on the range of viable remedial options.



Figure 4.1 Turkeys Nest and Camp Gully access

The area between the stormwater culvert and where Camp Gully Creek meets the Hacking River is shown in Figure 4.2 below.

Two Coal waste deposition zones were identified along the Creek bed that are >5 m<sup>2</sup> in area. The majority of accumulated fines were, however, noted to have settled into small pockets along the creek embankment. These accumulations will all be accessible as they are above the water line. Mine workers were observed along the stream completing the Phase 1 Clean-Up Protocols between the Mine site and McKinnon Gully.

There was evidence (debris accumulated in trees bordering creek line) that surface flows in the area can be high following rain events and, on this basis, remedial solutions involving creating coffer dams will be challenging,. Further it was noted that any proposed mechanical removal methods will likely cause physical damage to ecosystems in the locality with the majority of the deposits situated on a sand bed which will and will require physical disturbance to facilitate removal.

There is an existing path of travel along the top of the embankment that has only been cleared for personnel access.

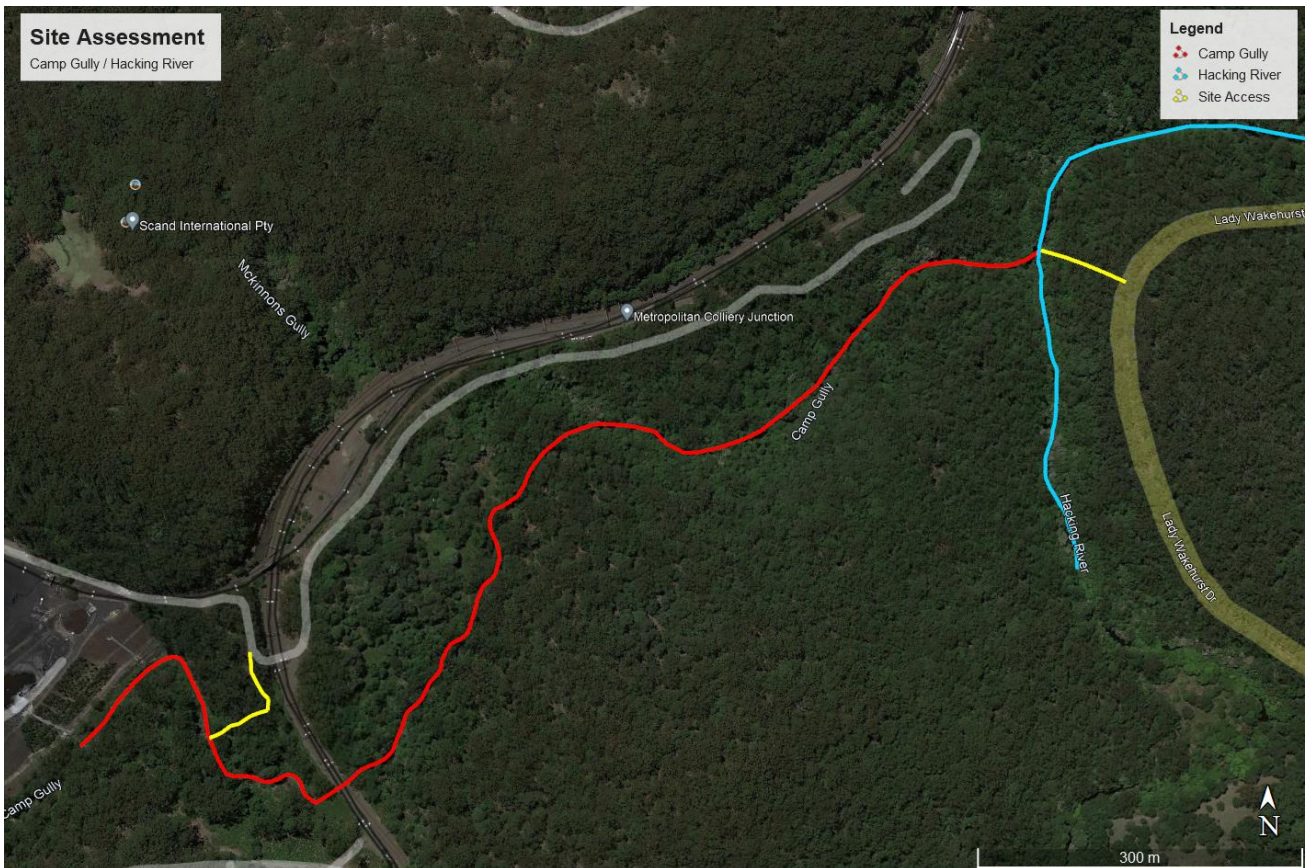


Figure 4.2 Section 2 – Camp Gully/Hacking River confluence

Camp Gully is accessible to foot traffic from Lady Wakehurst Drive but this walking track crosses fairly steep, vegetated terrain. At the time of inspections, mine workers had not commenced Phase 1 Clean-Up Protocols in the locality of the confluence with the Hacking River as the area is located on National Parks and Wildlife Services (NPWS) land which requires access approval to work.

The deposits observed in this locality were noted to be similar to those observed during the site walkover in the upper section of Camp Gully Creek, with some notable features including accumulated fine deposits  $>5 \text{ m}^2$  in area situated on top of sandstone bedrock. Removal of sediment in these areas will likely cause minimal environmental disturbance due to the sandstone bed. The solid bedding should minimise disturbance of excess sediment. Additionally, flow in this locality was observed to be lower, presenting a greater range of viable remedial options.

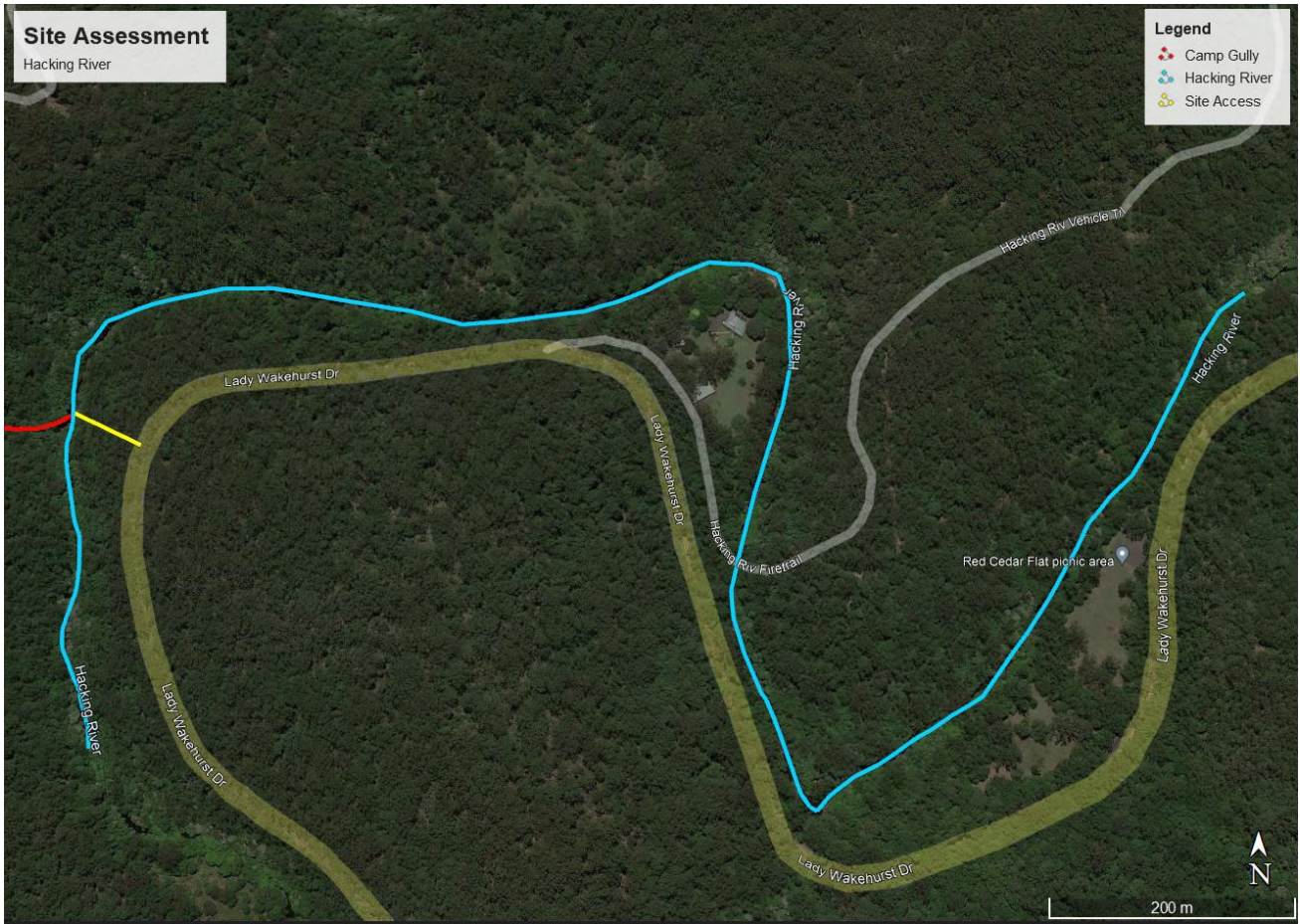


Figure 4.3 Section 3 – Hacking River

The section of Hacking River between the existing path of travel = on Lady Wakehurst Drive and the Red Cedar Campgrounds was in accessible at the time of the Remediation Site inspections due to recent rainfall events.

Recommendations for remedial options can still be provided for this Section 3 by referring to the deposition scenarios observed in Sections 1 and 2 of the Remediation Site.

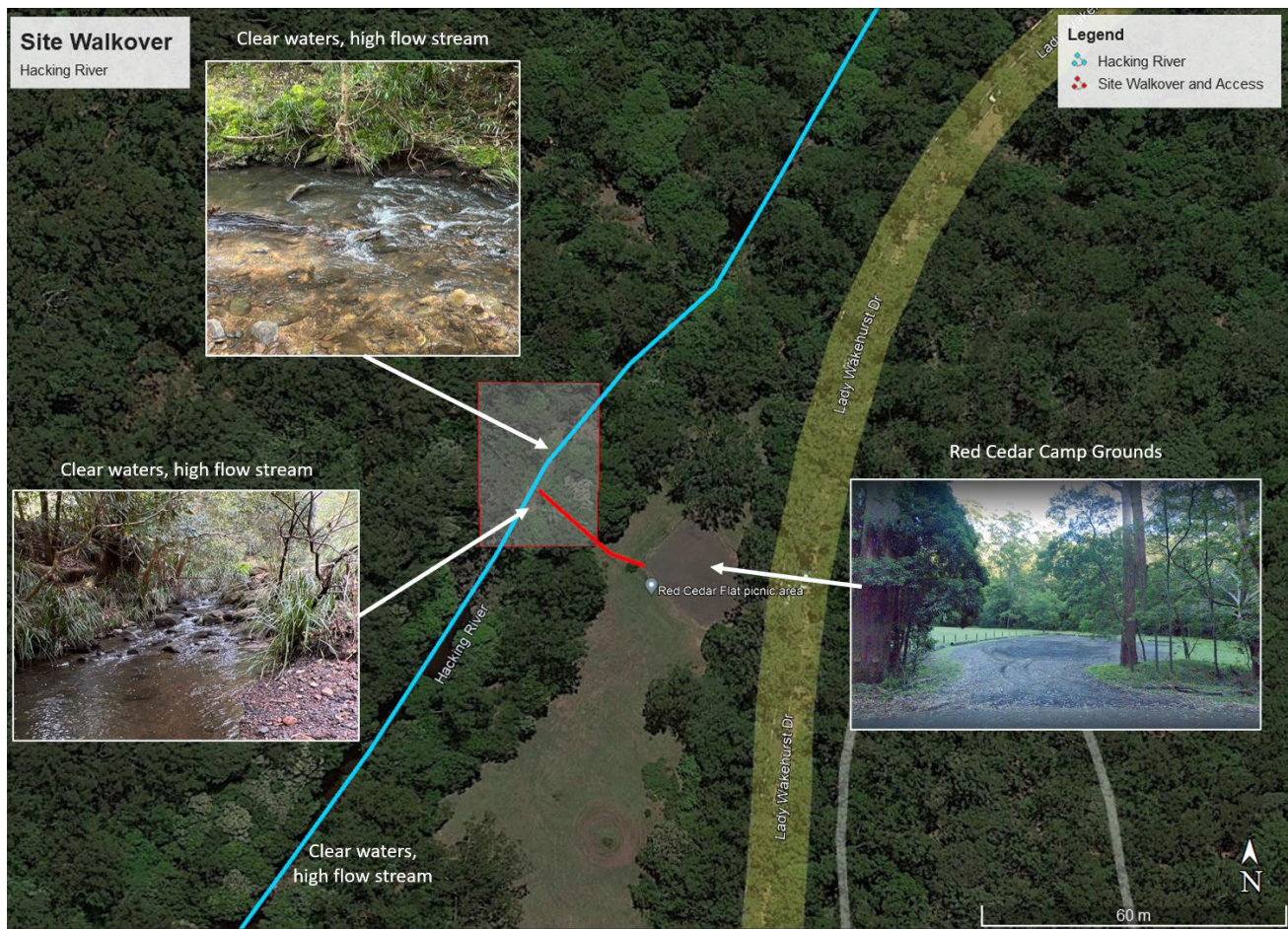


Figure 4.4 Section 4 – Hacking River/Red Cedar Campgrounds

Section 4 of the Remediation Site, comprising the area of the Hacking River accessible from the Red Cedar Campgrounds, was observed to have a high flow split stream. There was no visual evidence of coal sediment deposits apparent at the locality at the time of the Remediation Site walkover. Evidence of high flow levels were however noted in the locality with old deposits of coal observed caught in trees as they have been washed down the stream.

This area is located on NPWS land. Vehicle access from this entry point is limited to the campground.

## 4.2 Summary of visual assessment

Most of the coal sediment deposits and accumulated fines were observed along Camp Gully between the mine operation area (the Mine Site) and the confluence with Hacking River. Deposits were largely observed to be above the waterline with coal fines distributed below the waterline in areas where water flows were reduced, or physical structures (sandstone cobbles and boulders) were seen to catch deposited material in areas of <math><1\text{ m}^2</math> to




Coal sediment/accumulated fines of varying quantities were observed within the section of the Hacking River inspected during the site visits. It is noted that heavy flows and turbidity, following excessive rainfall events, within the Hacking River impeded further inspection and areas of accumulated material maybe present but not observed. It was observed that the flows within the Hacking River were larger than those along Camp Gully Creek.




Deposits along the Hacking River were observed above and below the water line largely consisting of small areas (<math><2\text{ m}^2</math>) with some areas of accumulated medium to coarse coal pieces. Concentrations of coal materials generally coincided with physical structures (sand banks, sandstone cobbles and boulders) or areas of the river where water flows were slower.

Examples of the observed coal deposits (as shown in Table 4.1) were photographed and have been characterised as a series of deposition scenarios to assist with assessment, selection and implementation of remedial strategies.

See below Table 4.1 for different observations and scenarios.

Table 4.1 Examples of Impacted areas

Scenario	Image	Description
1		<p>Cloudy water caused by mobilisation of accumulated coal fines downstream.</p> <p>The fines will mobilise during further rainfall events due to increased flows within the creek and river.</p>
2		<p>Accumulated coal fines typically covering an area of less than 1 m<sup>2</sup> in size. Fine deposits commonly located where physical structure exists with the base of the creek observed to be a sand/gravel base.</p> <p>The collection pools are typically shallow, approximately &lt;0.3 m depth.</p>
3		<p>Accumulated coal fines ranging in area between 1 m<sup>2</sup> to 5 m<sup>2</sup>.</p> <p>These areas have a mix of coarse and fine grain coal sediment situated on a sand/gravel strata.</p> <p>Sandstone bedrock was observed within the base of Camp Gully Creek primarily between McKinnon Gully and the Hacking River.</p> <p>The water depth in these areas ranged from ~0.2 m to ~0.8 m.</p>

Scenario	Image	Description
4		<p>Accumulated medium/coarse coal sediment of an area larger than 5 m<sup>2</sup>.</p> <p>Depth of water in these areas are typically 0.4 to 0.8 m.</p> <p>The number of locations with this volume of material is limited and concentrated where flows are less due to existing structures.</p>
5		<p>Fine sediment observed in sandy pools along Hacking River.</p> <p>Accumulated fines are deposited on the sandy embankments/beds as water levels recede following heavy rainfall events.</p> <p>Sediment above the waterline will be easily accessible and able to be removed manually.</p>
6		<p>Deposits situated in and near high flow areas ranging from 1 m<sup>2</sup> to 2 m<sup>2</sup> in area. Access to many of these coal deposits are restricted as they are wedged in and around medium to large sized rocks.</p>



# 5 Phase 2 remedial options

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## 5.1 Remediation objective

The objective of the Phase 2 remediation is: the physical reduction, to the extent practical, of the visible and *recently*<sup>4</sup> accumulated mass of coal fines within the Remediation Site, whilst minimising potentially adverse impacts to the surrounding environment.

The remedial options proposed for consideration to achieve the objective need to adequately address:

- the material volumes required to be removed
  - minimising physical disturbance of the existing fauna and flora both within the creek bed and along the adjoining creek banks
  - minimisation of adverse impacts to the aquatic ecosystem
  - the need to execute the Phase 2 remediation works in a timely manner to minimise further potential for environmental harm.
- 

## 5.2 Constraint considerations

This section outlines the environmental and physical working constraints that may impact the proposed remedial options.

Areas that require remediation cross multiple land holdings including Mine lease, National Parks and Wildlife Service land and Crown Land. Currently Phase 1 clean-up works is prohibited on the latter two lands areas, pending landowner permission.

Due to Remediation Site location and restricted physical access issues, remedial options may be limited to manual removal of coal impacts. Access to the creek is currently limited to pedestrians and there is no vehicular access introducing mobilisation challenges for any type of plant or machinery.

Additional permission from NPWS would also be required should vehicles and machinery be required to be mobilised to complete the works.

Environmental considerations have also been identified for each remedial option highlighting the need to minimise footprint disturbance. Any option requiring the establishment of stockpile and laydown areas would require vegetation clearance works as would the construction of new access tracks. As a result, remedial options involving cut through tracks or area clearance may not be feasible as more damage to the environment may be caused than if the area was left undisturbed.

If civil solutions are introduced, existing freshwater ecosystems must be maintained.

At the present time, continual rainfall events in the area will increase the water levels of the stream, increasing flows and rapids which will cause challenges to implementation of some of the identified remedial options. Additional controls and safety requirements may be required to facilitate the works.

The proposed options listed in Section 5.3 aim to work within the abovementioned constraints.

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<sup>4</sup> With a coal mining history in the locality dating back to the 1880s it is acknowledged that there are legacy deposits of coal fines located in the local environment which have been either discharged from the mining operations or physically placed in the locality before the existence of legislative controls on the off-site disposal of coal wastes. It is, however, further acknowledged that irrespective of the material age, all coal materials present in the Deposition Scenarios described in Table 4.1 will be removed as part of the proposed methods, irrespective of the age of the deposit.

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## 5.3 Remedial options considered

Remedial options considered are as follows:

- Option One – Mechanical Filtration Systems.
  - Option Two – Establishment of coffer dams, dewatering and filtration of water followed by the collection of residual coal material.
  - Option Three – Passive Collection of medium to coarse coal sediments using nets/manual screening.
  - Option Four – Removal of accumulated coal fines and turbid water using a Vacuum Recovery System (Sucker Truck or similar).
  - Option Five – Establishment of Civil infrastructure within the creek bed to collect coal material.
  - Option Six – Monitor flows and manual collection of exposed coal material as it presents.
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## 5.4 Remediation options appraisal

### 5.4.1 *Option One – Mechanical filtration systems*

#### 5.4.1.1 Description/Methodology

Extraction of suspended solids within a liquid matrix can be achieved through mechanical filtration systems readily available in the market or manufactured specifically for an application. For the purpose of this evaluation WSP has grouped the types of mechanical filtration according to similarities including, but not limited to, extraction and flow volumes, footprint requirements and energy consumption. Mechanical Filtration systems include:

- Cyclonic System
- Decantation System.

To support the infrastructure required for these options, additional vegetation/land clearing to establish laydown areas, stockpile areas and access tracks would be required. Establishing stockpile areas and any cutting of vegetation will be consulted by an ecologist on site prior to carrying out the works. Mechanical filtration systems require the addition of generators to power these systems.

Cyclonic Filtration utilises a cyclone to work like a centrifuge to separate solids from liquids. The liquid spins through the separation chamber and centrifugal force forces the solids into the separation chamber as the liquid exits via the outlet channel.

The Decantation System involves large infrastructure relative to other options. The process involves pumping water into settlement tanks and regular gravity discharge through a filter media.

### 5.4.1.2 Evaluation of remedial option

Table 5.1 Evaluation of Option One – Mechanical filtration

Advantages	Disadvantages	Environmental considerations
<ul style="list-style-type: none"> <li>— Effectively removes coal sediment from water column.</li> <li>— Can process large volumes of water.</li> <li>— Excels at removal of coarse and medium grained coal sediment.</li> <li>— Low operating costs once set up is completed.</li> </ul>	<ul style="list-style-type: none"> <li>— Requires significant infrastructure when compared to other options.</li> <li>— Large volumes of disturbance and water treated.</li> <li>— Impact to existing environmental setting.</li> <li>— Large waste stream (coal and existing sediments).</li> <li>— Ability to mobilise equipment and personnel quickly is unlikely.</li> <li>— Size of work force required to operate systems is large.</li> <li>— Power consumption when compared to other options is high.</li> <li>— Effectiveness is dependent on particle size, will struggle to filter light, accumulated fines.</li> <li>— These methods have historically been used in industrial applications and may not be suitable for this remediation work.</li> </ul>	<ul style="list-style-type: none"> <li>— Will require laydown areas (10 m × 10 m) to be established.</li> <li>— Access tracks (2 to 3 m width) cut into and along the creek to run hoses, power and provide access to work force.</li> <li>— Mechanical filtration causes the largest footprint disturbance relative to the other options.</li> <li>— Increased erosion from clearing/surface disturbance (requires an erosion and sediment control plan).</li> </ul>

## 5.4.2 Option Two – Establishment of Cofferdams

### 5.4.2.1 Description/methodology

Cofferdams is a method that involves disturbance within the creek bed. The dams are established by sandbagging around the targeted area to divert water away. Sandbags would be required to be carried in by manual labour or flown in using a helicopter. Sandbags would be located to surround the targeted area to create an isolated pool of water which will then be disturbed to extract accumulated coal fines.

Once the area is isolated, workers would collect the large coal sediment deposits using nets or other manual collection tools. Water within the isolated area would be pumped out using small submersible pumps. Extracted water would be passed through sediment controls such as geobags or filter socks to remove suspended solids and filtered water would be returned to the creek system.

The removal of the water would allow for the manual collection of large amounts of coal sediments as per the Phase 1 clean-up methods. Geobags would require a temporary stockpile area to lay down during the process. Geobags full of sediment would be transported off site for management/disposal.

Removal of sediment within the coffer dams will be aided by an aquatic ecologist to oversee environmental impacts marine life. Additionally, establishing stockpile areas and any cutting of vegetation on site will be consulted by an ecologist prior to carrying out the works.

Removal of geobags presents a manual handling risk if suitable stockpile areas are not established. For areas within the mine lease, geobags can continue to be stockpiled where bags from current Phase 1 clean-up protocols are being stored. The other downstream areas located on NPWS and Crown land may require a helicopter lift to transport waste off site.

Multiple areas can be isolated for remediation simultaneously, but this would be labour intensive and depend on the size of the available workforce.

### 5.4.2.2 Evaluation of remedial option

Table 5.2 Evaluation of Option Two – Establishment of Cofferdams

Advantages	Disadvantages	Environmental considerations
<ul style="list-style-type: none"> <li>— Cofferdams promote an isolated environment and control of disturbances.</li> <li>— Minimal environmental disturbance.</li> <li>— Coal sediment will be accessible by hand once area dammed.</li> <li>— Proposed equipment can be carried in or Heli lifted negating cutting of access tracks and vegetation removal.</li> <li>— Accumulated fines along the embankment will be easier to remove.</li> <li>— Geobag size can be customised to specific needs, having options to filter multiple range of sizes.</li> </ul>	<ul style="list-style-type: none"> <li>— Increase risk of injury from manual handling, i.e., transport of sandbags and sediment bags.</li> <li>— Flowing water causes difficulty damming areas of concern.</li> <li>— Requires the use of a pump, ideally pumps which can be transported by hand.</li> <li>— High flow pumps are typically vehicle mounted which will have the challenge of access.</li> <li>— Hand carried pumps will need to work within time constraints. (Multiple pumps may be used at the same time at different locations along the creek).</li> <li>— Not applicable to large pools of water in high flow areas.</li> </ul>	<ul style="list-style-type: none"> <li>— Will require laydown areas (10 m × 10 m) to be established.</li> <li>— Pump will cause disturbance to freshwater ecosystems, possibly pumping fish away from their habitat.</li> <li>— Vibration and noise from daily use of pumps.</li> <li>— Bunding required for pumps to avoid possible oil/diesel spill during use and/or refuelling.</li> </ul>

Advantages	Disadvantages	Environmental considerations
— Geobags use seaming techniques that withstand pressure during pumping operations.	— Spill potential when refuelling pumps.	

### 5.4.3 Option Three – Passive collection using scoops/netting

#### 5.4.3.1 Description/methodology

Coal sediment accumulated in pools would be collected using handheld equipment such as pool scoops or purpose-built netting. Workers would drag the bottom of the pools similar to how a pool cleaner would collect leaf and other debris in the base of the pool.

Movements would be slow and progressive to minimise disturbance of the underlying sediments and increases in turbidity. Turbidity monitoring would be required to be undertaken down gradient of the pools being remediated and works stopped when disturbance is considered too great. Works would resume following settlement of any suspended materials.

This method aims to minimise disturbance footprint and infrastructure requirements using existing walking tracks. Minor vegetation trimming would however be required to provide access along the entire creek.

Floating booms installed downstream of the remediation area can be used simultaneously to control mobilisation of disturbed sediment.

#### 5.4.3.2 Evaluation of remedial option

Table 5.3 Evaluation of Option Three – Passive collection using scoops/nets

Advantages	Disadvantages	Environmental considerations
<ul style="list-style-type: none"> <li>— Easily accessible on foot.</li> <li>— No requirement for power or vehicles.</li> <li>— Minimal set up required.</li> <li>— Minimal environmental disturbance.</li> <li>— Equipment and consumables are readily available.</li> <li>— Provides good recovery option in low/slow flow sections of the creek/river.</li> </ul>	<ul style="list-style-type: none"> <li>— Increase risk of injury from manual handling, trips, slips, falls.</li> <li>— Work affected by cycle time (filling and transport of waste bags to stockpile).</li> <li>— Suitability in high flow areas unlikely.</li> <li>— Labour intensive.</li> <li>— Productivity is weather dependent.</li> </ul>	<ul style="list-style-type: none"> <li>— Increased ground disturbance from personnel/foot traffic.</li> <li>— Minor vegetation clearance (trimming of vegetation) required.</li> <li>— Disturbance of sediment will increase turbidity within the creek/river during the works.</li> </ul>

## 5.4.4 Option Four – Removal of solids through vacuum recovery system

### 5.4.4.1 Description/methodology

Vacuum trucks have a range of uses such as waste removal, non-destructive digging and water extraction. This method is simple as all work is completed by the truck and an operator. It just requires direction of hose lines to areas of concern. Once set up this method involves minimal labour and a low level of supervision.

The challenge with using vacuum trucks in the creek however is largely in mobilisation, suction power and environmental disturbance. There are currently no identified locations for a sucker truck to access and park, the truck can be parked at the top of creek but will require a high-head pump due to distance from the vacuum truck to Camp Gully. Suction from the truck will largely disturb the water, possibly removing aquatic life along with sediment.

There is currently a track accessible on foot along Camp Gully via the entrance of the Mine Site. Widening the track may be an option however vegetation clearance in this area will result in increased risk of erosion from clearance and ground disturbance. Additional sediment and erosion plans will be required if this option is selected.

Access tracks would be required to be cut into the Remediation Site (within the National Park) to facilitate access of the truck or installation of long lines of suction hoses. Access tracks would need to be constructed to allow the safe egress of vehicles and personnel resulting in large volumes of material disturbance and clearance of wooded and vegetated areas.

### 5.4.4.2 Evaluation of remedial option

Table 5.4 Evaluation of Option Four – Removal of solids through vacuum recovery system

Advantages	Disadvantages	Environmental considerations
<ul style="list-style-type: none"> <li>— Commonly used to clean-up waste spills.</li> <li>— Proven technology for the clean-up of spills.</li> <li>— Effectiveness of clean-up.</li> </ul>	<ul style="list-style-type: none"> <li>— Access tracks required to be constructed to allow access to impacted area.</li> <li>— Head difference between top and bottom of creek will require high powered pump and long hose lines.</li> <li>— Difficulty mobilising sucker truck.</li> <li>— No control on suction of truck, may excessively pick up other solids in addition to the targeted coal waste.</li> <li>— High potential of damage to existing aquatic ecosystem.</li> <li>— Long hose lines required which will add a WHSE risk if poor housekeeping is maintained.</li> </ul>	<ul style="list-style-type: none"> <li>— Access tracks (2 to 3 m width) cut into and along the creek to support equipment and provide access to work force.</li> <li>— Will require turning circle approximately 7–8 m diameter to be established.</li> <li>— Damage to aquatic ecosystems and key fish habitats. Notable Endangered fauna (Red-crowned toadlet, giant burrowing frog).</li> <li>— Continual disturbance through machinery vibration.</li> <li>— Increased noise footprint.</li> <li>— Increase erosion from clearing/surface disturbance for the mobilisation of the sucker truck (requires erosion and sediment control plan).</li> </ul>

## 5.4.5 Option Five – Establishment of civil infrastructure

### 5.4.5.1 Description/methodology

Establishment of civil infrastructure could be completed in various forms including but not limited to:

- weirs constructed of natural materials such as sandstone boulders and/or concrete structures
- sediment traps constructed using natural materials such as sandstone cobbles and boulders and/or concrete structures.

Establishment of weirs and sediment traps would be installed at narrow pinch points downstream of the release site and impacted areas to collect mobilised material during wet weather periods. These structures would need to be accessible by vehicle and construction plant for ongoing maintenance and removal of accumulated fines.

The establishment of general sediment controls such as silt fencing, hay bale, floating booms or similar are not considered viable due to the high flows encountered within the creek and river.

Machinery will be required to work within the boundaries of the creek/river requiring similar disturbance to Option One.

Table 5.5 Evaluation of Option Five – Establishment of civil infrastructure

Advantages	Disadvantages	Environmental considerations
<ul style="list-style-type: none"> <li>— Effective at capturing sediment once installed.</li> <li>— Sandstone structure will use same material as the creek and will appear natural.</li> </ul>	<ul style="list-style-type: none"> <li>— Permanent structure – could impede flows.</li> <li>— Footprint and level of disturbance within the creek/river and National Park.</li> <li>— High maintenance – structures will capture debris and natural sediment movement.</li> <li>— Will impact ‘key fish habitats’.</li> <li>— Will only work in low to medium flows.</li> </ul>	<ul style="list-style-type: none"> <li>— Large vegetation clearance requirement.</li> <li>— Impede flows within the creek/river.</li> <li>— Visual amenity.</li> <li>— Increased construction activity.</li> <li>— Directly impacts stream, possible impact to fish migration.</li> <li>— Legacy issues with permanent structures.</li> </ul>

## 5.4.6 Option Six – Monitor flows and manual collection of exposed coal material as it presents

### 5.4.6.1 Description/methodology

Where accumulation of coal sediments is relatively small and/or the impacts to the environment exceed those being incurred by the presence of the coal fines a “do nothing” and monitor the impacted areas would be adopted. Collection of wastes would only occur when the coal sediments mobilise to a more accessible area or water flows within the creek/river reduce and presents an opportunity for the collection of the coal sediments.

Visual monitoring would be undertaken following periods of wet weather (>10 mm per 24 hr period) or 6 monthly intervals.

Inspections would be undertaken by a suitably qualified environmental practitioner (environmental scientist/ecologist) and a report prepared documenting the results of the inspection.

Where coal sediments have mobilised and present an opportunity for the implementation of one of the other remedial options, works would be undertaken in accordance with this plan.

### 5.4.6.2 Evaluation of remedial option

Table 5.6 Evaluation of Option Six – Monitor flows and manual collection of exposed coal material as it presents

Advantages	Disadvantages	Environmental considerations
<ul style="list-style-type: none"> <li>— Minimal disturbance of the existing environment.</li> <li>— Provides an ongoing management strategy of residual coal materials.</li> <li>— Lower impact to the environment than attempting to collect residual coal materials.</li> </ul>	<ul style="list-style-type: none"> <li>— Visual amenity – coal sediments will not be removed.</li> <li>— Potential for further distribution of coal sediment downstream of existing impacted areas.</li> </ul>	<ul style="list-style-type: none"> <li>— Minimal impact to the existing flora and fauna.</li> <li>— Ongoing distribution of coal sediment downstream.</li> <li>— Evaluation of impacts when and where opportunistic collection of coal materials presents.</li> </ul>



# 6 Preferred Phase 2 remediation option

Based on the assessment of the Phase 2 extent of impact, the level of coal impacted areas is variable and as such a tiered remediation strategy is warranted. Three remedial approaches are proposed as follows:

- Remedial Approach One (RA1) – (Option Three) Passive collection of impacted materials (manual collection using scoops and screens)
- Remedial Approach Two (RA2) – (Option Two) Establishment of small Cofferdams, dewatering and collection of coal impacted material.
- Remedial Approach Three (RA3) – (Option 6) Monitoring of flows and distribution, collection of accessible material as and when it presents.

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## 6.1 Remedial Approach One (RA1)

RA1 will target areas where manual recovery of sediments can be achieved below the water line whilst utilising small equipment, manual labour workforce, limited vegetation clearance and minimise impact to the existing creek/riverbed. RA1 will apply to Scenarios 2, 3 and 4.

These impacted areas are typically small in size, shallow, within existing structures and low flow areas of the creek/river.

RA1 will involve the manual collection of accessible material above the waterline (Phase 1 Protocols) along the embankment and collection of coal sediment below the waterline using pool scoops or similar.

Ongoing monitoring will be implemented during the works consisting of:

- visual assessment by an Environmental Practitioner (scientist/ecologist) with respect to impacts of the works including but not limited to the volume of disturbance including below the waterline, creek bed and general environment
- water quality monitoring using a YSI ProDSS Water Quality Meter (or similar). The following parameters will be monitored during the works:
  - Total Suspended Solids (TSS)/Turbidity
  - Dissolved Oxygen (DO)
  - pH
  - Electrical conductivity (EC).

Material collected during the execution of the works will be placed in small bags for removal from the creek / river and return to the mine site for reprocessing or disposal offsite to a licensed landfill.

Material removed from the creek / river will be aided by an aquatic ecologist to oversee environmental impacts to marine life. Additionally, establishment of stockpile areas and any cutting of vegetation on site will be consulted by an ecologist prior to carrying out the works.

### 6.1.1 *Equipment and resources required*

Equipment and resources listed in this section are required to facilitate effective manual removal of accumulated coal fines above and below the waterline:

- labour workforce (10 to 20 personnel)
- ecologist / marine ecologist
- containers for the placement of collected fines
- wheelbarrow or similar to aid in the transporting of the collected materials

- shovel
  - sieves
  - pool scoop
  - waste bags
  - specific Personal Protective Equipment (PPE) including, but not limited to, gumboots, gloves, high visibility work wear, safety glasses
  - skip bin or stockpile area agreed with regulator/landowners/stakeholders for the storage of waste materials.
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## 6.2 Remedial Approach Two (RA2)

RA2 will target areas where large volumes of accumulated coal sediments and fines are observed in low flow areas of Camp Gully Creek and Hacking River. RA2 will be used should Scenario 1 and 2 be identified. This approach will aim to remove sediment in low flow, areas where the establishment of coffer dams is considered appropriate to facilitate the removal of the observed coal materials whilst minimising the overall impact to the surrounding environment.

Coffer dams will be established where the overall flow of the creek/river will largely remain unimpeded, and areas of impact are more than 5 m<sup>2</sup> but less than 20 m<sup>2</sup>.

Establishment of coffer dams are not proposed in high flowing areas or across the full width of the creek/river which would require mobilisation of large pumps to adequately implement this approach.

The general methodology to be implemented will be as follows:

- establishment of downstream controls including but not limited to floating booms and or silt curtains
- establish the coffer dam using sandbags
- using handheld tools (scoops, shovels or similar) remove coal sediments from within the coffer dam
- where significant coal sediment remains, water held within the coffer dam will be removed using submersible pumps. Water removed from the coffer dam will be discharged through filter materials such as a Geobag or filter sock
- following removal of water from within the coffer dam, coal sediment will be collected using hand tools and material removed from the Remediation Site
- on completion of the works, all equipment and controls will be removed from the Remediation Site.

Ongoing monitoring will be implemented during the works consisting of:

- visual assessment by an Environmental Practitioner (scientist/ecologist) with respect to impacts of the works including but not limited to the volume of disturbance including below the waterline, creek bed and general environment
- water quality monitoring using a YSI ProDSS Water Quality Meter (or similar). The following parameters will be monitored during the works:
  - Total Suspended Solids (TSS)/Turbidity (Nephelometric Turbidity Units (NTU))
  - Dissolved Oxygen (DO)
  - pH
  - Electrical conductivity (EC).

Coal material collected during the execution of the works will be placed within small bags for removal from the creek/river and return to the Mine Site for reprocessing or disposal offsite to a suitably licensed waste treatment and/or disposal facility.

Setup and collection of coal within the coffer dams will be aided by an aquatic ecologist to oversee environmental impacts marine life. Additionally, establishment of stockpile areas and any cutting of vegetation on site will be consulted by an ecologist prior to carrying out the works.

### 6.2.1 *Equipment and resources required*

Equipment listed in this approach are proposed to aid in damming and the manual collection of accumulated coal fines.

Equipment and resources required for this approach include, and are not limited to, the following:

- labour workforce (10 to 20 personnel)
- water quality monitoring equipment
- containers for the placement of collected coal fines
- wheelbarrow or similar to aid in the transporting of the collected materials
- floating booms/silt curtains
- sandbags
- Submersible Water Pump (TBA)
- portable generator (subject to submersible pump)
- portable bunds (storage of pumps and fuel and to contain refuelling activities)
- pool scoop
- waste bags
- filter sock
- shovel
- specific PPE including, but not limited to, gumboots, gloves, high visibility work wear, safety glasses.

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## 6.3 Remedial Approach Three (RA3)

RA3 will be implemented where the other listed remedial approaches would result in impacts to the existing environment which would be considered in excess of the actual impact observed. This is most likely applicable to areas of high flow which would require the construction of significant structures to divert, capture or remove water and sediment to facilitate collection of coal sediment.

RA3 is essentially a “do-nothing” approach until such time as less intrusive recovery methods as outlined in RA1, and to a lesser extent RA2, become relevant.

RA3 may become the preferred approach following execution of RA1 and RA2 where residual coal material remains as further works would adversely impact the surrounding environment. RA3 is applicable to Scenarios 5 and 6.

The methodology for RA3 will generally be as follows:

- the area will be inspected by a suitably qualified environmental practitioner (Scientist/Ecologist). The Environmental practitioner will document the impacted areas and complete a risk assessment to document the rationale for not implementing or ceasing RA1 or RA2
- these areas will be documented and recorded in a register maintained by the Peabody

- periodic inspections will be completed by suitably qualified personnel after high rainfall (>10 mm), prolonged rainfall periods (>5 days of <10 mm rainfall) or at six monthly intervals
- following inspection of the creek/river the register will be updated to reflect the current impacts and areas requiring remediation or removal from the register
- inspections will also include a monitoring program at key intervals along Camp Gully Creek and Hacking River identified as follows:
  - licensed discharge point
  - downstream pool – Stormwater Culvert
  - McKinnon Gully Confluence with Camp Gully Creek
  - confluence between Camp Gully Creek and Hacking River
  - Hacking River – Red Cedar Campground
- removal of RA3 requirements will be by agreement with NSW EPA and NPWS.

### 6.3.1 *Equipment and resources required*

Equipment and resources required for this approach include, and are not limited to, the following:

- suitably qualified Environmental Practitioner (Scientist / Ecologist)
- camera and documented procedures
- water quality monitoring equipment
- specific PPE including but not limited to: gumboots, gloves, high visibility work wear, safety glasses.

# 7 Planning and execution of Phase 2 remedial approaches

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## 7.1 Phase 2 remediation trial

A trial of the proposed remedial approaches RA1 and RA2 will be completed outside the NPWS and Crown lands to assess and fine tune methodologies and environmental controls.

The boundary of the remediation trial phase will be between the Mine Site and McKinnon Gully.

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## 7.2 Planning and WHSE considerations

Considering the complexity of the proposed remediation approaches, special attention to planning is required to achieve the expected outcomes. Prior to commencing the remediation activities, WSP, in conjunction with Peabody and other relevant stakeholders (if required), will develop work health safety and environment (WHSE) documentation which covers the key operational procedures, activities, and milestones required to achieve the objectives of this Phase 2 Remediation Protocol, including the trial phase. This will include (as a minimum):

- job safety analyses and/or safe work method statements (SWMS) will be prepared for tasks required to be undertaken under this Phase 2 Remediation Plan
  - induction of all site personnel to ensure that they are aware of the WHSE requirements relating to the Phase 2 remediation project
  - confirmation that the personnel and/or contractors engaged to conduct remediation activities have adequate training, safety equipment and has appropriate knowledge of the designated working areas to ensure risks to all staff, the general public and the environment are minimised for the duration of the remediation activities.
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## 7.3 Approvals

### 7.3.1 Preliminary approval pathway

This section provides a preliminary discussion on the approval pathway and information requirements. Additional information on the project, study area and proposed works is required before confirming the approval pathway.

WSP understands that areas that require remediation cross multiple land holdings including Mine lease, NPWS land and Crown Land. Currently Phase 2 clean-up works is prohibited on land outside the Mine Lease and additional approvals are required for each parcel of land under separate ownership. This section does not address approval pathways for land outside the National Park.

WSP understands consultation has occurred with NPWS and the component of the work proposed within the National Park will occur as emergency works under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). A Review of Environmental Factors (REF) is required to be prepared to consider Division 5.1 Section 5.5 of the EP&A Act and examine and consider to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. Consultation is required with NPWS to confirm the approval pathway, timing and specialist reports required for the REF. The REF must also address the 'Guidelines for Division 5.1 assessments' (Department of Planning and Environment, 2022).

The REF must also consider legislation including that shown in Table 7.1 (please note this list is not exhaustive and additional investigation is required to confirm other relevant legislation).

Table 7.1 Relevant legislation

Act	Relevance
<i>Commonwealth Environmental Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)	Consistency is required with: <ul style="list-style-type: none"> <li>— objects of the Act</li> <li>— matters of National Environmental Significance</li> <li>— impact on Commonwealth land.</li> </ul>
<i>National Parks and Wildlife Act 1974</i>	Consistency is required with: <ul style="list-style-type: none"> <li>— objects of the Act</li> <li>— reserve management principles</li> <li>— leasing, licencing and easement provisions</li> <li>— management powers and responsibilities</li> <li>— Aboriginal objects and Aboriginal places.</li> </ul>
<i>Wilderness Act 1987</i>	Consistency is required with: <ul style="list-style-type: none"> <li>— objects of the Act</li> <li>— wilderness management principles</li> <li>— restrictions.</li> </ul>
<i>Biodiversity Conservation Act 2016</i>	Consistency is required with: <ul style="list-style-type: none"> <li>— objects of the Act</li> <li>— considerations for protection of plants and animals, including threatened species and threatened ecological communities.</li> </ul>
<i>Fisheries Management Act 1994</i>	Consistency is required with: <ul style="list-style-type: none"> <li>— activity affects fish, fish habitat or marine vegetation, including threatened species</li> <li>— dredging or reclamation.</li> </ul>
<i>Heritage Act 1977</i>	Consistency is required with: <ul style="list-style-type: none"> <li>— activity may affect: <ul style="list-style-type: none"> <li>— State heritage</li> <li>— item identified by National Parks and Wildlife Service as being of potential State significance</li> <li>— Section 170 register</li> <li>— other heritage items.</li> </ul> </li> </ul>
<i>Water Management Act 2000</i>	Consistency is required with: <ul style="list-style-type: none"> <li>— objects of the Act.</li> </ul>

### 7.3.2 Consultation (REF)

Consultation is required as part of determining the approval pathway, other approvals required and environmental mitigation measures. Consultation is required with the following as a minimum:

- National Parks and Wildlife Service

- Department of Primary Industries – NSW Fisheries
- NSW Department of Planning and Environment – Environment & Heritage.

### 7.3.3 Consultation (outside of National Park)

Consultation is required with the following as a minimum:

- NSW Crown Lands
- any other landowners or managers on land affected.

## 7.4 Waste characterisation, management, and disposal

The proposed Phase 2 remediation works will generate waste soil materials containing coal fine particles. It is assumed that waste soil will be sufficiently dewatered at the collection point, such that the materials transferred in bags to stockpiling areas will not create runoff and any waste materials will be of a “spadeable” consistency to allow its assessment and classification as a solid (not liquid) waste. Appropriate management of this waste material will require temporary stockpiling and/or storage of small volumes throughout the remedial activities. A dedicated temporary stockpiling and/or storage area on the Mine Site is to be proposed by Peabody in consultation with relevant stakeholders, and approval should be sought if required. The material collected from the remediation works program will be transported to the Mine Site periodically and reprocessed by Peabody where appropriate.

### 7.4.1 Site Management

The stockpiling and/or storage area must be secured and adequate to prevent waste loss of containment during the remediation process. Temporary stockpiling areas are only to be established in consultation with and approval by the on-site aquatic ecologist and NPWS on a site-by-site basis where appropriate. Environmental controls/erosion and sediment controls will be established around any temporary stockpiling and/or storage area for the duration of the works program.

### 7.4.2 Offsite Disposal

It is understood that Peabody proposes to reprocess the coal waste material through the onsite facilities wherever possible. It is understood that NSW EPA are agreeable with this approach and that it will not trigger a requirement for a separate approval under the *Protection of the Environment and Operations Act 1997*.

If the waste soil material does require off-site disposal, it will require assessment and classification for offsite management in accordance with the provisions of the *POEO Act 1997*. Whilst waste soil materials typically require sampling and analysis for suspected contaminants to enable classification in accordance with the NSW EPA *Waste Classification Guidelines (2014)*, WSP notes that the nature of the waste may allow for its classification for potential offsite beneficial reuse under the Coal Washery Rejects Resource Recovery Order (RRO) 2014. This order specifies minimum sampling and analysis densities including a list of potential contaminants of concern to analyse the waste material for to allow potential offsite reuse. These primarily include metals, combustible content, and sulphur.

Any waste coal material not able to be processed on site or consigned for reuse under a RRO will require assessment and classification under the NSW EPA (2014) *Waste Classification Guidelines* prior to its removal from the Mine Site for treatment and/or disposal at a NSW EPA licenced waste facility approved to accept the class of waste to be disposed of. Prior to the consignment of waste fill material, approval would be sought from the facility to accept the waste.

All removed coal soil material to be treated on-site or reused/ treated and /or disposed of off-site should be tracked to provide detailed and accurate information about the location and quantity of all materials both on- and off-site from the time of their removal until their treatment, relocation, or disposal.

Off-site reuse or treatment/disposal facility locations will be determined by Peabody in consultation with WSP and other relevant stakeholders (if required), should excess material requiring disposal be generated. The offsite movement of material should be recorded by Peabody through the tracking system which records all vehicle movements offsite and

collates all waste reuse and or disposal records. For any vehicle moving waste material off-site, the following information will be recorded:

- material type/classification
- approximate volume
- final destination
- vehicle registration number

This information, along with the NSW EPA licenced waste facility docket/receipt numbers for any materials disposed of to an off-site facility, should be collated for remediation validation purposes.

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## 7.5 Site supervision

An experienced and suitably qualified environmental consultant from WSP will be on-site to provide full-time supervision of the remediation works throughout the Phase 2 remediation activities. The environmental consultant will be responsible for implementing the environmental and quality controls, designation of applicable remediation procedures, monitoring protocols, and reporting activities as established by this Phase 2 remediation protocol.

The appointed environmental consultant will have the authority to stop works immediately if any non-compliance with this remediation protocol is recorded. Examples of non-compliance may include any inadequate deviation from standard safety practices, exceedances in water quality parameters or aesthetic indicators, and incorrect management of waste.

The environmental consultant will be responsible for inspecting the remediation works daily and will maintain direct communication with Peabody about the progress of the remediation project. The environmental consultant will ensure that the WHES Plan, SWMSs and any other regulatory documentation (e.g., planning approvals) are correctly implemented on-site.

The environmental consultant may also be required to assist Peabody with waste classification and/or reuse assessments conducted on-site and tracking of any offsite of the waste materials.

During site supervision works, the environmental consultant will be available to provide advice on the remediation approaches to be applied and the associated activities. They will also be required to identify sources of improvement of the remediation works. Any WHSE incidents or unexpected finds, such as unexpected sources of contamination and heritage finds, will be immediately communicated by the environmental consultant to Peabody. The environmental consultant will ensure that reporting is timely delivered to Peabody about the progress of the remediation process. Progress reports will be provided on a weekly basis at minimum.

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## 7.6 Auxiliary works

### 7.6.1 *Vegetation clearing/minor ground disturbance*

It is noted that no major vegetation clearing has been proposed as part of the remedial option activities. Selective brush trimming or cutting of vegetation will be limited to clear existing paths of travel to the work areas. The selective trimming or cutting main purpose will be to provide safe, unobstructed access to site personnel and equipment to the remediation areas. The removal of mature trees is not contemplated within the scope of works of this remediation plan without prior consultation with Peabody and relevant stakeholders/ land owners.

Minor clearance of vegetation within the impacted areas may be also required to reduce the risk of trips, slips and falls, and improve safe working conditions, particularly for access in case of emergency. Within these impacted areas, vegetation clearing will be limited to low- to mid-storey vegetation.

At commencement of the remediation activities, an appropriately qualified ecologist will be on-site to supervise implementation of environmental controls. Once the appropriately qualified ecologist considers that controls are



effectively implemented to minimise any ecological impacts, the appropriately qualified ecologist will delegate the supervision of the ecological controls to the on-site environmental consultant from WSP.

If any clearance works are required, for example, to establish laydown areas (less than 5 m × 5 m) for waste and equipment or to define a helipad or heli-lift zones, an appropriately qualified ecologist shall be engaged to conduct a pre-clearance survey to avoid impacts on fauna and flora species. This clearance shall be confined to low and mid-storey vegetation to enable direct line of sight from the helicopter to the ground. These heli-lift or helipad zones must be identified within the trial phase. Any new proposed heli-lift or helipad areas must be reviewed and approved as remediation work in progress by Peabody and other relevant stakeholders.

The appropriately qualified ecologist will determine if any restoration activities are required post-remediation works.

Minor ground disturbance will be limited to the activities of collection of coal impacted materials, establishment of coffer dams and temporary waste storage/stockpiling. Ground disturbance is to be generated primarily from the utilisation of manual tools to collect coal impacted material and levelling areas of less than 10 m × 10 m for laydown purposes. Any minor ground disturbance activities will be conducted in areas that have been previously authorised by the site supervisor and/or appropriately qualified ecologist..

### 7.6.2 *Work health and safety*

Peabody's safety principles will be considered during the establishment of the site-specific Work Health Safety (WHS) controls for this remediation project. Appropriate WHS controls would be established by WSP for the personnel involved in remedial works at the site. This will involve the finalisation of a detailed WHSE Plan (or HESP) by WSP prior to mobilisation to the site. The WHSE plan will be prepared prior to commencing on-site works associated with this remediation protocol, including trial works.

The plan will address the WHS of site users and workers in the surrounding area. As a minimum, it will consider:

- site security
- manual excavation safety
- working near gullies and creeks
- wildlife risks
- working remotely
- noise
- odour; and
- dust.

Work associated with the remediation activities will conform, at a minimum, to the requirements of the SafeWork NSW requirements and associated Regulations. Typically, the WHSEP will address the following issues:

- regulatory requirements
- responsibilities
- hazard identification and control
- chemical hazard control
- sample and chemical handling procedures
- personal protective equipment
- work zones
- decontamination procedures

- emergency response plans
- contingency plans; and
- incident reporting.

The WHSEP should include emergency contact numbers such as police, fire brigade, hospital and contact details for all relevant personnel. Response to any incidents occurring on site should be in accordance with the WHSEP.

### 7.6.3 *Weed control*

Weed control activities and equipment must be implemented to reduce the potential for weed spread prior to, during, and post the remediation works. Based on the context of the site, the higher risk of weed spread is from introducing weed seeds to the remediation areas and to areas within the NPWS land at the site. It is recommended that decontamination units (i.e., bio-cleaning stations) are established at strategic locations prior the access to the remediation working areas.

The EPA-approved ecologist will determine if weed control measures are effective for implementation throughout the project and provide recommendations to manage any weed impacts (if any) post-remediation works.

### 7.6.4 *Erosion and sediment control*

An erosion and sediment control plan will be prepared for the site, including requirements for managing coffer dams and stockpiled/stored soil, and will be required to be prepared prior to commencement of remedial works, including the trial.

The location nominated for temporary stockpiling/storing waste soil material will be selected to fit with the expected stages of the project. Stockpiles will be located in accordance with the following general requirements:

- stockpiles will only be placed at approved locations
- stockpiles will be strategically located to mitigate environmental impacts while facilitating material handling requirements
- coal materials will only be stockpiled in non-remediated areas of the site or at locations that do not pose any risk of environmental impairment of the stockpile area or surrounding areas (i.e. bunded areas), and
- stockpiles will only be constructed in areas of the site that have been located and prepared in accordance with the requirements of this remediation protocol.

As with other soil handling, care should be taken not to create dust or track soil out of the designated remediation area.

Furthermore, prior to the removal of coal fines from the impacted areas, an adequate erosion and sediment control system will be installed. One of the most common erosion control alternatives is the use of gravel/sand bag barrier downslope of the immediate work area. Alternatively, filter socks may be filled with the sand along the stream to create sandbags. This will minimise manual handling risk carrying pre-filled sandbags.

The erosion control measures will assist in reducing any suspended particles that could potentially be transported following rainfall, particularly in sections that had recently been disturbed. Also, the erosion control will act as a secondary barrier for suspended coal fines and prevent the spread of disturbed coal fines downstream from the working areas.

The WSP site supervisor will regularly inspect the erosion control systems and undertake water quality monitoring (including turbidity) to determine their effectiveness. If the erosion control measures are observed to be failing, works shall stop immediately, and the system improved/repaired.

If deemed necessary, assistance should be sought from an erosion control specialist regarding the design, placement and maintenance of the erosion and sedimentation control for both the remediation work area during and following the remediation works in locations where vegetation clearance/ground disturbance has been implemented.

### 7.6.5 *Portable equipment*

It is anticipated that portable fuel powered equipment will be used, for example to power water pumps for RA2, as part of the remediation activities. The use of fuel power tools and equipment will be minimised where possible. All fuel power equipment must be within the manufacturers recommended service period, and the service certificate should be verified prior the operation of any fuel powered equipment. The operator of this equipment will keep records of the usage of the fuel powered equipment to ensure that this equipment is timely serviced. No fuel powered equipment is to be serviced on-site.

Equipment that contains fuel storage tanks will be bunded to contain any potential fuel leakages. The bunding volume capacity should exceed the volume of fuel stored in the equipment. No fuel is to be stored at the remediation working areas, and controls should be implemented to avoid leaving fuel powered equipment unsupervised (i.e. demobilising fuel powered equipment daily if possible).

Refuelling of equipment will be done with maximum care to avoid health or environmental risks. No equipment should be operating while it has been nominated for refuelling. Equipment should be refuelled outside the remediation area if possible. An emergency spill kit will be available on-site in case any minor hydrocarbon spills occur.

### 7.6.6 *Post remediation activities*

WSP and Peabody, in consultation with the NSW EPA and any other relevant stakeholder, will determine if any post remediation activities are required for the site once remediation has been validated as completed. The post-remediation activities may include, and are not limited to:

- decommissioning of all safety and erosion controls from the site
- additional weed control activities
- restoration and supplementary planting of endemic species if required
- stabilisation engineering controls for the gully embankment (if affected)
- rehabilitation of existing paths of travel/access tracks, laydown areas, heli-lift zones used as part of the remediation works
- further monitoring or inspection of the remediated area.

In addition to the above, an assessment will be undertaken by a suitable qualified ecologist.

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## 7.7 Risk management

Prior to the commencement of the remediation works, including trials, a risk workshop will be convened by Peabody and WSP to review the works to be completed, identify key risks to be managed, including controls to be implemented during the works.

A risk assessment will be completed which considers work health and safety, environmental impacts and change management. The risk assessment will be recorded in Peabody standard risk assessment format and reviewed by Peabody and relevant stakeholders prior to the works being initiated.

The works will generally be carried out in accordance with Peabody and WSP standard operating procedures including but not limited to:

- safe work procedures (manual handling, portal power tools etc.)
- environmental management procedures (erosion control, vegetation management etc.)
- Peabody operational procedures.

### 7.7.1 *Training/awareness/induction*

All site personnel will be required to complete the Peabody surface works induction and a site-specific induction prepared for the works. The induction will include but not be limited to:

- location and type of works to be undertaken
- emergency response contacts and procedures
- roles and responsibilities
- policies and procedures relevant to the works
- approvals, environmental controls required for the works
- stop work authority
- exposure settings and appropriate controls (if any)
- cultural and environmental areas of significance (if any).

It will be a requirement that any person entering the Remediation Site will be required to have completed all inductions and awareness training.

### 7.7.2 *Community and public safety*

Peabody and WSP hold the management of public safety in high regard and will put in place measures and controls to ensure the public are safely protected from any clean-up operations undertaken. Although it is unlikely to have large volumes of members of the public accessing the clean-up area, Peabody and WSP will implement a range of safety controls for protection of the public. These controls will include but are not limited to:

- the demarcation of work areas
- site signage with Peabody and WSP contact information
- temporary security fencing where required.

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## 7.8 Change management

Both Peabody and WSP have undertaken planning and reviewed potential remediation options in order to form the basis of this report and any actions required to be implemented as part of the Phase 2 clean-up protocol. There are however, circumstances that might arise that require further actions to be implemented that may not have been foreseen during the development of this Report.

Any changes to the remediation activities outside what has been communicated and approved will be assessed in consultation with the NSW EPA and any other relevant stakeholders.

The change management process helps to provide a framework for the assessment of risks associated with a proposed change to site activity to ensure that any changes outside an approved scope of work have been approved by the appropriate levels of management/ stakeholders. This ensures that any controls required have been identified and implemented prior to the change being accepted.

As part of the change management process, NSW EPA will be notified, and due diligence assessments will be undertaken if required in consultation with the NSW EPA. If required and if the change management process identifies, the remediation protocol herein may be modified in consultation with the NSW EPA.

## 7.9 Responsibilities

The following table outlines the responsibilities of various personnel associated with the implementation of the Phase 2 Clean-Up Protocols.

Table 7.2 Responsibilities

Position	Key responsibilities
Remediation Activity Operators (Peabody or nominated contractor)	<ul style="list-style-type: none"> <li>— Ensuring they undertake their remediation activities in accordance with the approved Phase 2 Remediation Protocol.</li> <li>— Be aware of the requirements of the Phase 2 Remediation Protocol and the key controls to be implemented associated with the activity they are undertaking.</li> <li>— Have an understanding and adhere to all safety and environmental controls required to complete their respective tasks.</li> <li>— Report any incidents immediately to the WSP Remediation Site Supervisor.</li> <li>— Participate in any safety or environmental toolbox talks.</li> </ul>
Remediation Site Supervisor (WSP)	<ul style="list-style-type: none"> <li>— Provide regular communication of all safety and environmental controls within the Phase 2 Remediation Protocol and associated Standard Operating Procedures (SOPs).</li> <li>— Coordinate day to day activities on site.</li> <li>— Undertake regular inspections of the remediation activities to ensure that all activities are being carried out in accordance with the approved Phase 2 Remediation Protocol.</li> <li>— Ensure all work party members are inducted and trained in the appropriate management systems applicable to the tasks they are undertaking.</li> <li>— Coordinate risk-based assessments where required for specific tasks.</li> <li>— Regularly report on remediation progress to Peabody.</li> <li>— Liaise with the Peabody Remediation Project Manager.</li> </ul>
Remediation Project Manager (Peabody)	<ul style="list-style-type: none"> <li>— Oversee remediation activities and undertake regular inspections of the work area to confirm activities are being undertaken in accordance with the Phase 2 Remediation Protocol.</li> <li>— Undertake Health Safety, Security and Environment (HSSE) visits to confirm activities are being undertaken in a safe and environmentally friendly manner.</li> <li>— Liaise with the WSP Remediation Site Supervisor regarding to remediation progress.</li> <li>— Collation of the remediation status reports for submission to NSW EPA.</li> <li>— Undertake regular reviews of the Phase 2 Remediation Protocol based on site progress and communicate any changes to the remediation team and NSW EPA.</li> </ul>

Position	Key responsibilities
Environment and Community Superintendent (Peabody)	<ul style="list-style-type: none"> <li>— Ensure adequate Peabody/nominated contractor resources are made available for overseeing the implementation of the Phase 2 Remediation Protocol.</li> <li>— Responsible for approving any changes to the Phase 2 Remediation Protocol.</li> <li>— Undertake regular consultation with NSW EPA on the implementation of the Phase 2 Remediation Protocol.</li> </ul>
NSW EPA Representative	<ul style="list-style-type: none"> <li>— Responsible for signoff of the proposed Phase 2 remediation works protocol.</li> <li>— Oversee remediation activities and provide advice as required during the implementation of the protocol.</li> </ul>
National Parks and Wildlife Representative	<ul style="list-style-type: none"> <li>— Facilitate the approvals required to undertake the works within the National Park.</li> <li>— Oversee remediation activities and provide advice as required during the implementation of the Phase 2 Remediation Protocol.</li> </ul>

# 8 Preliminary environmental impact assessment

The proposed remedial approaches have been selected to provide the least amount of disturbance to the current environment and impacts to potential biodiversity communities.

A preliminary assessment will be completed as part of the preparation of a REF being prepared by WSP.

The likely key impacts of proposed works have been identified as:

- **Erosion and Sedimentation** – Ground disturbance resulting in increased sediment impacted run off, impacts to potential endangered species such as the red crown toadlet (burrowing frog).
- **Vegetation clearance** – This is to be kept to a minimum with no felling of trees proposed. Existing paths of travel will be utilised for foot traffic and small handheld equipment. Laydown areas if required will target existing cleared areas.
- **Noise** impacts will be relatively minor with works limited to the use of small handheld equipment such as submersible pumps and generators. Work hours will be limited to Monday to Friday (7 am to 5 pm). No nightworks or weekend works are currently proposed.
- **Aboriginal and Cultural Heritage** – An initial review has not identified items of significance within the proposed works area, but a more detail review of available information is being completed as part of the REF.
- **Surface Water and Hydrology** – Proposed works are unlikely to impact the current surface water and hydrology of the area. Temporary structures may be constructed within the bed of the creek and river to allow the recovery of material. No permanent structures are proposed.
- **Flora and Fauna** – A preliminary assessment of flora and fauna will be undertaken as part of the REF.

# 9 Site supervision, monitoring, stakeholder engagement and reporting

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## 9.1 Site supervision

Project management and site supervision will include:

- coordination of the project team and any subcontractors.
- collaboration and communication with Peabody representatives regarding technical queries and progress updates.

A WSP ecologist will work alongside the WSP Site Supervisor to monitor and work within the Remediation Site environmental constraints.

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## 9.2 Monitoring

For the duration of Phase 2 Clean-Up works, WSP is proposing to monitor the following environmental values:

- surface water
- flora and fauna
- vegetation
- erosion and sedimentation.

### 9.2.1 *Surface water monitoring*

A surface water monitoring program will be implemented for the Remediation Site to monitor overall water quality in the surrounding catchment. A monitoring program will be proposed which includes sampling locations which provide water quality results upstream, from the affected channel, downstream as well as in reference channels. Samples will be taken during flow conditions for pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS).

### 9.2.2 *Flora and fauna monitoring*

As outlined in Section 2.2.3, several species are indicated to potentially appear within the locality. A suitably qualified specialist will undertake a field survey within the site to identify any potentially impacted flora and fauna. Should any potentially impacted flora and fauna be identified during this assessment Peabody and WSP, in consultation with NSW EPA, will arrange for Aquatic Habitat and Species monitoring to be undertaken, by a suitably qualified specialist, at a frequency to be agreed to by NSW EPA in the areas of concern.

### 9.2.3 *Vegetation monitoring*

A vegetation monitoring program will be established in consultation with a qualified ecologist and the NSW EPA to assist with monitoring the extent (and type) of vegetation growth within the Remediation Site. This will include quantitative surveys of the Remediation Site prior to, during and post remediation activities at a frequency agreed to by the NSW EPA.



#### 9.2.4 Erosion and sedimentation monitoring

As outlined in Section 7.6.4, existing sediments will be impacted from proposed work activities. Monitoring of erosion and sedimentation will be undertaken within the Remediation Site by a qualified specialist to identify the development of erosion and sedimentation impacts throughout Phase 2 Clean-Up works at a frequency agreed to by the NSW EPA.

### 9.3 Stakeholder engagement

Peabody and WSP will continue to consult with the NSW EPA, NPWS and any other identified stakeholders regarding the implementation and actioning of the Phase 2 clean-up protocols.

Table 9.1 below provides an overview of key external stakeholders that have been identified as well as the engagement methods that will be employed throughout the remediation program of works:

Table 9.1 Stakeholder engagement

Stakeholder	Engagement method	Frequency
NSW EPA	— Periodic Meetings — Operational Status Report	— Weekly — Fortnightly
National Parks and Wildlife Services	— Periodic Meetings — Operational Status Report	— Weekly — Fortnightly
Peabody	— Periodic Meetings — Operational Status Report	— Weekly — Fortnightly

### 9.4 Proposed schedule of works

An indicative Schedule of Works is provided in Table 9.2 below which outlines major tasks and milestones for the completion of the remediation works. The duration of works is dependent on Peabody's preferred remediation option and pending approvals. This schedule is only indicative and only identifies major tasks and as such should not be used for auditing or tracking purposes.

Table 9.2 Indicative schedule

Tasks/milestones	Time of completion
Submission of Draft Remediation Plan (this document)	10 October 2022
Stakeholder Approval of Remediation Options	17 October 2022
Submission of REF	17 October 2022
Approvals from Landowners (National Parks and Wildlife Services, Crown Land)	24 October 2022
Commence Trial Phase (Auxiliary Works and Sediment Removal)	17 October 2022
Commencement of Remedial works within Crown and National Park lands	31 October 2022
Completion of Remedial Works	30 November 2022
Submission of Final Report	21 December 2022

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## 9.5 Reporting

WSP will provide Peabody and other stakeholders with a fortnightly operational status report on remediation progress. The report will include at minimum the following:

- update on remediation progress against schedule of works
- any modifications to remediation methodologies agreed through consultation with stakeholders
- any safety and environmental incidents or concerns
- updates to monitoring results.

Upon completion of the remediation works WSP will prepare and submit a Factual Remediation Completion Report to Peabody and other stakeholders.

# 10 Remediation validation

This section identifies how successful implementation of remedial approach will be demonstrated. A validation process is required to be implemented to document whether the objectives of the Phase 2 remediation works have been achieved.

As noted in Section 5.1, the objective of the Phase 2 remediation is: the physical reduction, to the extent practical, of the visible and recently accumulated mass of coal fines within the Remediation Site, whilst minimising potentially adverse impacts to the surrounding environment.

WSP considers that based on the proposed remediation works, requirements for validation sampling and analysis within the Remediation Site is not an applicable validation method and as such a validation sampling and analysis quality plan will not be required.

The validation of the Phase 2 clean-up works will largely be based visual assessments, including a series of site walkover inspections and collection of photographic evidence to validate that the majority of the areas of impact. This process should aim to demonstrate that recent coal impacts have been physically removed from the Remediation Site to the extent practicable.

A proposed program of visual validation will be implemented as per the recommendations for Remedial Approach three, but for the entire Remediation Site.

Visual validation activities will be completed following all Phase 2 site works and will include:

- walkover inspections by a suitably qualified environmental practitioner (Scientist/Ecologist) to document coal finds in the remediated areas. Photographic records will be supplemented with GPS information and as necessary sketch plans. Where the remediated areas were previously recorded in the register maintained by the Peabody under Remediation Approach, the register will be updated with the new information
- walkover inspection records will also include surface water quality monitoring data collected at each completed remediation area and immediately up and down gradient of the area.

The validation records will be presented as a chapter/appendix to the Factual Remediation Completion Report

Other remediation validation records to be included in the Completion Report, as per the requirements of the NSW EPA (2020) Consultant Reporting on Contaminated Land guidelines will include:

- description of remedial activities completed with any deviations from the remediation protocol (e.g. volumes and characteristics of material removed, treated or disposed)
- plans showing areas remediated and areas of residual contamination
- quantities of materials recovered from the Remediation Site
- waste management records including:
  - waste classification reports in accordance with EPA (2014) Waste Classification Guidelines
  - summary of material handling and tracking and reconciliation of volumes or weight of soil removed from the Remediation Site and disposed off-site
  - statements regarding materials being disposed via appropriately licenced facility or re-used under an order or exemption
  - waste disposal dockets or other waste documentation for any disposed waste
- summary and evidence (for example documentation) of compliance with Project regulatory requirements
- summary of all validation findings
- conclusions addressing the stated remediation objectives

- recommendations for further work or management, if appropriate.

# 11 Limitations

This report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or part, for any other purpose (*Permitted Purpose*). A limitations statement pertaining to this report is presented and attached in Appendix B.

# Bibliography

BIO-ANALYSIS (2022). Camp Gully Creek Clean-Up Protocol. Prepared for Metropolitan Coal Pty Limited, dated 21 September 2022.

# Appendix A

Clean-up Notice (3503769, REG-3251)





# Clean-Up Notice

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Licence 767

METROPOLITAN COLLIERIES PTY. LTD.  
Trading as  
91 003 135 635  
PO BOX 402  
HELENSBURGH NSW 2508

Attention: STEPHEN LOVE

Notice Number           3503769  
Reference Number        REG-3251  
Date                        30-09-2022

## Clean-up Notice

### Why is the EPA writing to you?

The Environment Protection Authority (EPA) reasonably suspects that a pollution incident has occurred or is occurring on land that forms part of 1 PARKES STREET HELENSBURGH NSW 2508 (Premises). The EPA has issued you with this Clean-up Notice. Further information is set out in the notice below.

### What are you required to do?

Please read this notice carefully and carry out the clean-up action specified in this notice by the date required. If you have any queries about this matter, please contact Greg Newman on 0408 206 035.

### BACKGROUND

- A. The EPA has responsibility for the administration and enforcement of the *Protection of the Environment Operations Act 1997 (Act)*.





# Clean-Up Notice

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- B. METROPOLITAN COLLIERIES PTY. LTD. (Licensee) is the holder of environment protection licence no. 767 (Licence) issued under the Act in respect of the Premises. The Licence authorises the carrying out of *coal works* and *mining for coal*.
- C. As the holder of the Licence, the Licensee is the occupier of the premises for the purposes of s 91(1)(a) of the POEO Act.
- D. The EPA is the appropriate regulatory authority for licensed premises as per section 6 of the POEO Act.
- E. Between 3 - 4 July 2022 and 2-8 September 2022, discharges of water containing fine coal particles occurred at the premises. The July event occurred during rainfall when a pipe became blocked by coal sediment in the main sedimentation dam. Dirty water backed up in the pipe and flowed down an embankment into Camp Gully (Creek). Camp Creek flows to the Hacking River.
- F. The EPA inspected the premises on 17 August 2022 and 8 September 2022. The EPA observed coal fines deposited on the creek bank and in the creek bed. The coal fines were observed in the creek from discharge point 8 to at least 50 m downstream of the railway bridge. The coal fines covered the rocks and the sandy substrate of the creek bed. The amount of coal material was such that in many places it was not possible to see the bed material or surface of the rocks.
- G. Section 91 of the POEO Act enables the EPA to issue a Clean-up Notice in respect of a pollution incident.
- H. The Dictionary to the POEO Act defines:
- “Pollution incident” as an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise.
- I. The EPA reasonably suspects that a pollution incident is occurring or has occurred from the premises.
- J. On 19 August 2022, under licence condition E1 *Assessment of environmental impact and remediation options for coal spill*, the EPA directed the licensee to engage an ecologist to undertake an ecological assessment of any environmental impact that may have resulted due to the discharge and to examine options to recover the material.
- K. On 22 August 2022 the licensee proposed two ecologists to undertake the above assessment.
- L. On 24 August 2022 the EPA approved the proposed ecologists to undertake the assessment.
- M. On 9 September 2022 the licensee submitted the report required under licence condition E1.
- N. The approved ecologists recommended that the material “accumulated along the stream banks of Camp Creek should be removed manually as soon as possible to avoid further distribution of the coal material downstream”.
- O. The approved ecologists also recommended that “monitoring of water quality and aquatic macroinvertebrates undertaken on 24 August 2022 should be repeated at the same spatial scales 1 week prior to the clean-up and 2 weeks and 4 weeks following the clean-up”.
- P. EPA will require protocols for separate phases of the clean up. That is, Phase 1 for coal material above the water line and Phase 2 for coal material beneath water line.
- Q. The EPA is directing the Licensee to take clean-up action because the Licensee is the occupier of the premises, and the EPA reasonably suspects you of causing or having caused the pollution incident.



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- R. On 16 September 2022 the EPA issued Clean Up Notice Number 3503716 requiring the submission of a Phase 1 Clean Up Protocol by 19 September 2022, the commencement of the removal of coal from the Creek by 20 September 2022, and submission of a proposed independent, suitably qualified and experienced professional / company by 21 September 2022.
- S. On 19 September the licensee; submitted the *Camp Gully Creek Clean-Up Protocol*; on 20 September commenced clean up of the creek, and on 21 September proposed WSP Australia Pty Limited (WSP) as the independent, suitably qualified and experienced company to evaluate clean up options and recommend a preferred clean up method/s.
- T. The EPA has approved WSP as the independent company to develop the Phase 2 Clean Up Protocol.
- U. EPA is issuing this notice requiring an evaluation of clean up options and proposal of a preferred clean up option/s to inform the Phase 2 Clean Up Protocol.

Note: Clean-up actions are to be undertaken in an environmentally sensitive manner so as not to cause additional harm.

## DIRECTION TO TAKE CLEAN-UP ACTION

The EPA directs METROPOLITAN COLLIERIES PTY LTD to take the following clean-up action:

### Phase 1 Clean Up

Phase 1 of the clean-up operation involves the removal of coal material from above the water line along Camp Gully Creek and the impacted areas of the Hacking River in a manner that minimises impacts to the ecology, the bed and banks of the watercourse, and downstream water quality. Phase 1 of the clean-up commenced on 20 September 2022.

1. Clean up works as listed in the *Camp Gully Creek Clean up Protocol* must continue until the EPA notifies the licensee that the works have been completed.

Note: The EPA will draw on ecological advice in making this decision.

### Phase 2 Clean Up

Phase 2 of the Clean Up involves removal of coal material from beneath the water line, on the bed, and within the banks of Camp Gully Creek and the impacted areas of the Hacking River. Removal of coal material at these locations has a greater potential to cause water quality impacts due to the location and the fine nature of some of the coal material.

2. By **4:00 pm on 10 October 2022** the licensee must submit a Clean Up Options Evaluation Report (report) prepared by WSP which:
  - a. Draws upon the information presented in *Camp Gully Creek Clean up Protocol* (phase 1)
  - b. Defines or describes the type of coal material deposited in Camp Gully Creek and the Hacking River.



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- c. Demonstrates land owner consultation or steps undertaken to obtain approval/s.
- d. Presents an evaluation of a range of systems and techniques (options) which could be used to remove the coal material.

Note: The options evaluation should consider factors such as suitability, effectiveness, assessability, ecological & environmental impacts, logistics, and timeliness.

- e. Identifies preferred clean up option/s as an outcome of the above evaluation.
- f. Proposes a Clean Up Criteria which defines / describes the type of coal material deposited in Camp Gully Creek and the Hacking River which will be cleaned up using the preferred clean up options. For example, material description, size or quantity of deposit, and location.

## Notes:

- i. Clean-up actions are to be undertaken so as not to cause additional harm.
- ii. Different clean up options may be appropriate for different types of coal deposits.
- iii. The EPA is of the view there is a balance between removal of deposited coal and causing further environmental disturbance by clean up actions.
- iv. This section must include comments from a WSP ecologist supporting the above information and any proposed actions.
- g. Presents a proposed clean up protocol incorporating the Clean Up Criteria and the preferred clean up option/s.

Note: Access to the creek and river has been limited by recent increased rainfall and water levels during the evaluation period. Decisions about areas to be cleaned up can be made with consideration of observations from the time works commence.

The Phase 2 protocol included with the report must include a description of:

- h. the locations of Camp Gully Creek and the impacted areas of the Hacking River to be cleaned up
- i. the resourcing of the clean up works.
- j. an indicative schedule of works including any staging of waterway sections.



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Note: The aim of this schedule should be to complete the works as quickly as possible while monitoring and controlling any potential impacts to natural systems.

- k. the Clean Up Criteria and methodology / methodologies for removal of coal material.
- l. measures to minimise removal and disturbance of natural material.
- m. measures to minimise water quality and other pathogenic impacts.

Note: This must include pathogenic controls as listed in

<https://www.environment.nsw.gov.au/research-and-publications/publications-search/hygiene-guidelines>

- n. a real time monitoring program (visual and/or instrumentation) to detect disturbances from the works and any necessary responses to these disturbances.
- o. water quality and creek disturbance criteria that if exceeded for an unacceptable period would temporarily stop the clean-up.
- p. The clean up supervision.

Note: EPA expects supervision by WSP. The supervisor must be given the authority to stop the clean-up where the disturbance criteria are exceeded.

- q. stockpile or consolidation areas displayed on a map
- r. collection, handling, consolidation, transport, prompt removal of material from the creek areas, and disposal of waste.
- s. a "Validation Criteria" defining the measures to be utilised to determine that an area has been adequately cleaned of coal material associated with the incident.
- t. restorative works as needed
- u. weekly written progress reports to be submitted to the EPA listing quantities of materials removed and any proposed changes to clean up methodologies.
- v. A monitoring program to determine recovery of the creek from the incident (if required) and to evaluate any restoration of the creek.
- w. Endorsement from a WSP ecologist supporting the above protocol .

3. Once the EPA has approved the Protocol, and appropriate approval/s have been obtained for NPWS land, clean up must commence immediately.

Note: Clean up means implementing Phase 1 and 2 Protocols

## FEE TO BE PAID

- You are required by law to pay a fee for the administrative costs of issuing this notice. An invoice for the fee has been attached to this notice.
- It is an offence not to pay this fee. However you can apply for an extension of time to pay the fee or for the fee to be waived. At the end of this notice there is information about how and when to pay the fee and how to apply for an extension or a waiver of the fee.

# Clean-Up Notice

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**Greg Newman**  
**Unit Head**

(by Delegation)

## **WARNINGS AND INFORMATION ABOUT THIS CLEAN-UP NOTICE**

- This notice is issued under section 91 of the Act.
- It is an offence against the Act not to comply with a clean-up notice unless you have a reasonable excuse.
- Details provided in this notice will be available on the Public Register in accordance with section 308 of the Act
- If this notice is issued to a corporation and the notice is not complied with by the date specified, the EPA may, under s 91A(2) of the Act, issue a supplementary clean-up notice to a current or former director or manager, or a related body corporate, directing them to carry out, or ensure the carrying out of, clean-up action specified in the supplementary notice.

## **Penalty for not complying with this notice**

- The maximum penalty that a court may impose for a corporation is \$1,000,000 and a further \$120,000 for each day the offence continues. The maximum penalty that a court may impose for an individual is \$250,000 and a further \$60,000 for each day the offence continues.

## **When this notice begins to operate**

- This notice operates from the day the notice is given, unless a later date is specified in the notice.

## **Continuing obligation**

- Under section 319A of the Act, your obligation to comply with the requirements of this notice continues until the notice is complied with in full, even if the due date for compliance has passed.

## **Cost recovery from the person(s) who caused or contributed to the incident**

- If you comply with this clean-up notice but you are not the person who caused, or solely caused, the pollution incident to which the notice relates, you have a right to go to court to recover your costs, or part of your costs, of complying with the notice from persons who caused or contributed to the incident.



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## Deadline for paying the fee

- The fee must be paid by **no later than 30 days after the date of this notice**, unless the EPA extends the time to pay the fee, or waives the fee.

## How to pay the fee

- Possible methods of payment are listed on the last page of the attached invoice/statement.
- Please include the payment slip from the attached invoice/statement with your payment.

## How to apply for an extension of time to pay/waive the fee

- Any application for an extension of time to pay the fee or for the fee to be waived must be made in writing to the EPA. The application should set out clearly why you think your application should be granted.

## Other costs

- The Act allows the EPA to recover from you reasonable costs and expenses it incurs in monitoring action taken under this notice, ensuring the notice is complied with and associated matters.
- If you are required to pay these other costs and expenses you will later be sent a separate notice called a “Notice Requiring Payment of Reasonable Costs and Expenses”.

## Variation of this notice

- The requirements of this notice may only be varied or revoked by written notice issued by the EPA.

# Appendix B

Limitation statement





# Limitation Statement

This Report is provided by WSP Australia Pty Limited (*WSP*) for Peabody Energy Australia Pty Ltd (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 5 October 2022 and agreement with the Client dated 6 October 2022 (*Agreement*).

## PERMITTED PURPOSE

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (*Permitted Purpose*).

## QUALIFICATIONS AND ASSUMPTIONS

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (*Conclusions*) are based in whole or in part on information provided by the Client and other parties identified in the report (*Information*), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

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## About Us

WSP is one of the world's leading professional services consulting firms. We are dedicated to our local communities and propelled by international brainpower. We are technical experts and strategic advisors including engineers, technicians, scientists, planners, surveyors and environmental specialists, as well as other design, program and construction management professionals. We design lasting solutions in the Transport & Water, Property & Buildings, Earth & Environment, and Mining & Power sector as well as offering strategic Advisory, Engagement & Digital services. With approximately 6,100 talented people in more than 50 offices in Australia and New Zealand, we engineer future ready projects that will help societies grow for lifetimes to come. [www.wsp.com/en-au/](http://www.wsp.com/en-au/).

