

METROPOLITAN COAL LONGWALLS 308-310

BUILT FEATURES MANAGEMENT PLAN



METROPOLITAN COAL

LONGWALLS 308-310

BUILT FEATURES MANAGEMENT PLAN

WOLLONGONG CITY COUNCIL [OLD PRINCES HIGHWAY]

Revision Status Register

Section/Page/ Annexure	Revision Number	Amendment/Addition	Distribution	DPE Approval Date
All	LW308-310 BFMP_WCC- R01-A	Original	WCC, MEG and DPE	-

February 2022

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1 INTRODUCTION

The Metropolitan Coal Mine is owned and operated by Metropolitan Coal Pty Ltd (Metropolitan Coal), which is a wholly owned subsidiary of Peabody Energy Australia Pty Ltd (Peabody). The Metropolitan Coal Mine is located adjacent to the township of Helensburgh (Figure 1), approximately 30 kilometres (km) north of Wollongong in New South Wales (NSW).

Metropolitan Coal was granted approval for the Metropolitan Coal Project (the Project) under section 75J of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) on 22 June 2009. A copy of the Project Approval is available on the Peabody website (<http://www.peabodyenergy.com>).

The Project comprises the continuation, upgrade and extension of underground coal mining operations (Longwalls 20-27 and Longwalls 301-317) and surface facilities at Metropolitan Coal. Longwalls 308-310 are situated to the west of Longwalls 301-307 and define the next mining sub-domain within the Project underground mining area (Figures 1, 2 and 3). Longwall 311 will be subject to future Extraction Plan.

1.1 PURPOSE AND SCOPE

In accordance with Condition 6(f), Schedule 3 of the Project Approval, this Built Features Management Plan – Wollongong City Council (BFMP-WCC) has been developed to manage the potential consequences of longwall extraction on the Wollongong City Council assets.

The relationship of this BFMP-WCC to the Metropolitan Coal Environmental Management Structure is shown on Figure 4.

This BFMP-WCC includes post-mining monitoring and management of Wollongong City Council assets subject to the previously approved Metropolitan Coal Longwall 305-307 Extraction Plan.

In accordance with Condition 6, Schedule 3 of the Project Approval, the suitably qualified and experienced experts that have prepared this BFMP-WCC, namely representatives from Mine Subsidence Engineering Consultants (MSEC) and Metropolitan Coal were endorsed by the Secretary of the Department of Planning and Environment (DP&E) (now the NSW Department of Planning and Environment¹ [DPE]). This BFMP-WCC has been prepared in consultation with Wollongong City Council, including consideration of prior consultation during the development of the previously approved Built Features Management Plans.

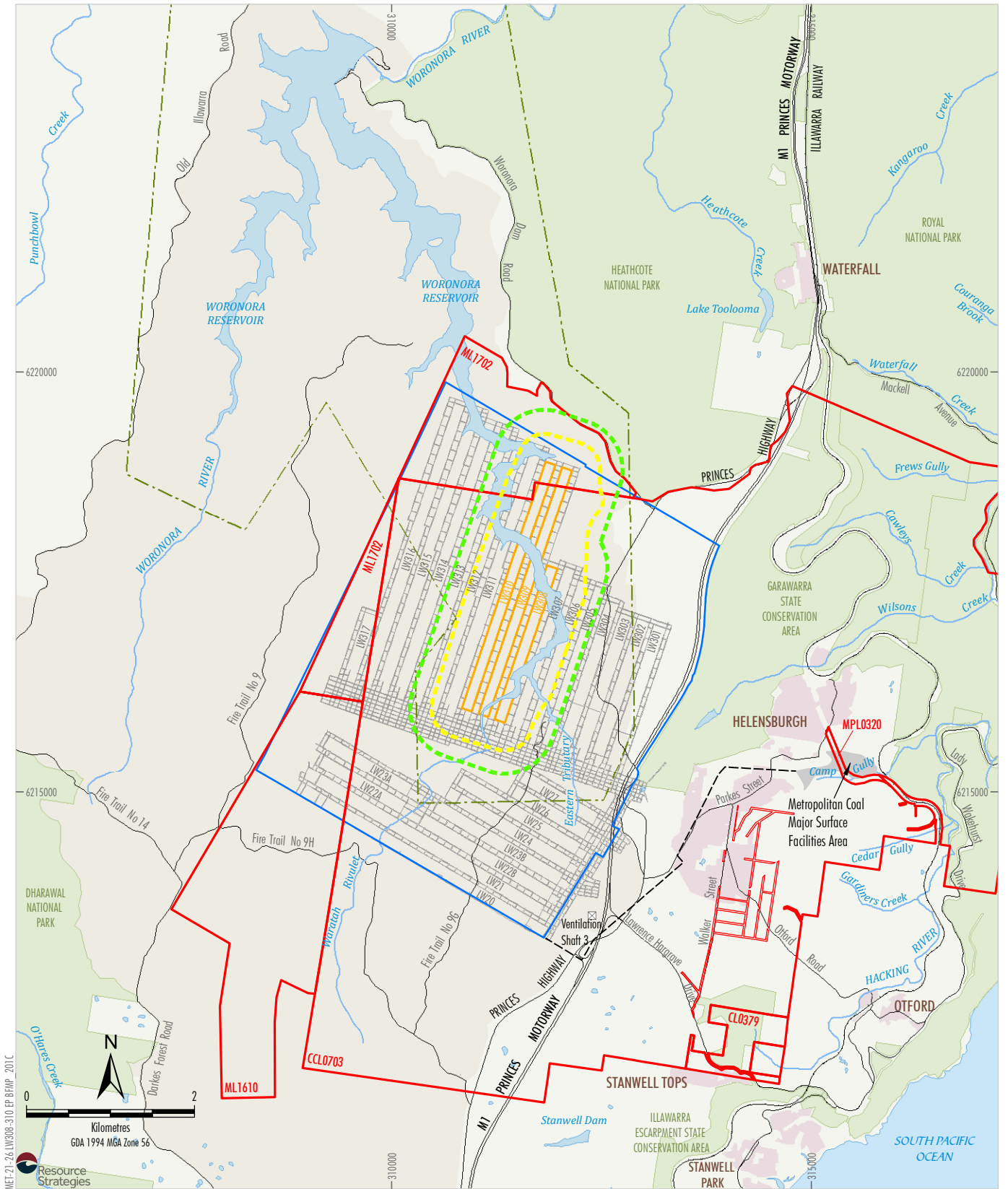
1.2 STRUCTURE OF THE BFMP-WCC

The remainder of the BFMP-WCC is structured as follows:

- Section 2: Describes the review and update of the BFMP-WCC.
- Section 3: Outlines the statutory requirements applicable to the BFMP-WCC.
- Section 4: Provides a revised assessment of the potential subsidence impacts and environmental consequences for Longwalls 308-310.
- Section 5: Details the performance measures and indicators that will be used to assess the Project.
- Section 6: Provides the detailed baseline data.
- Section 7: Describes the monitoring program.

¹ The former Department of Planning, Industry and Environment (DPIE) was renamed to the Department of Planning and Environment (DPE) on 21 December 2021. References to DPIE have been retained throughout the remainder of this document.

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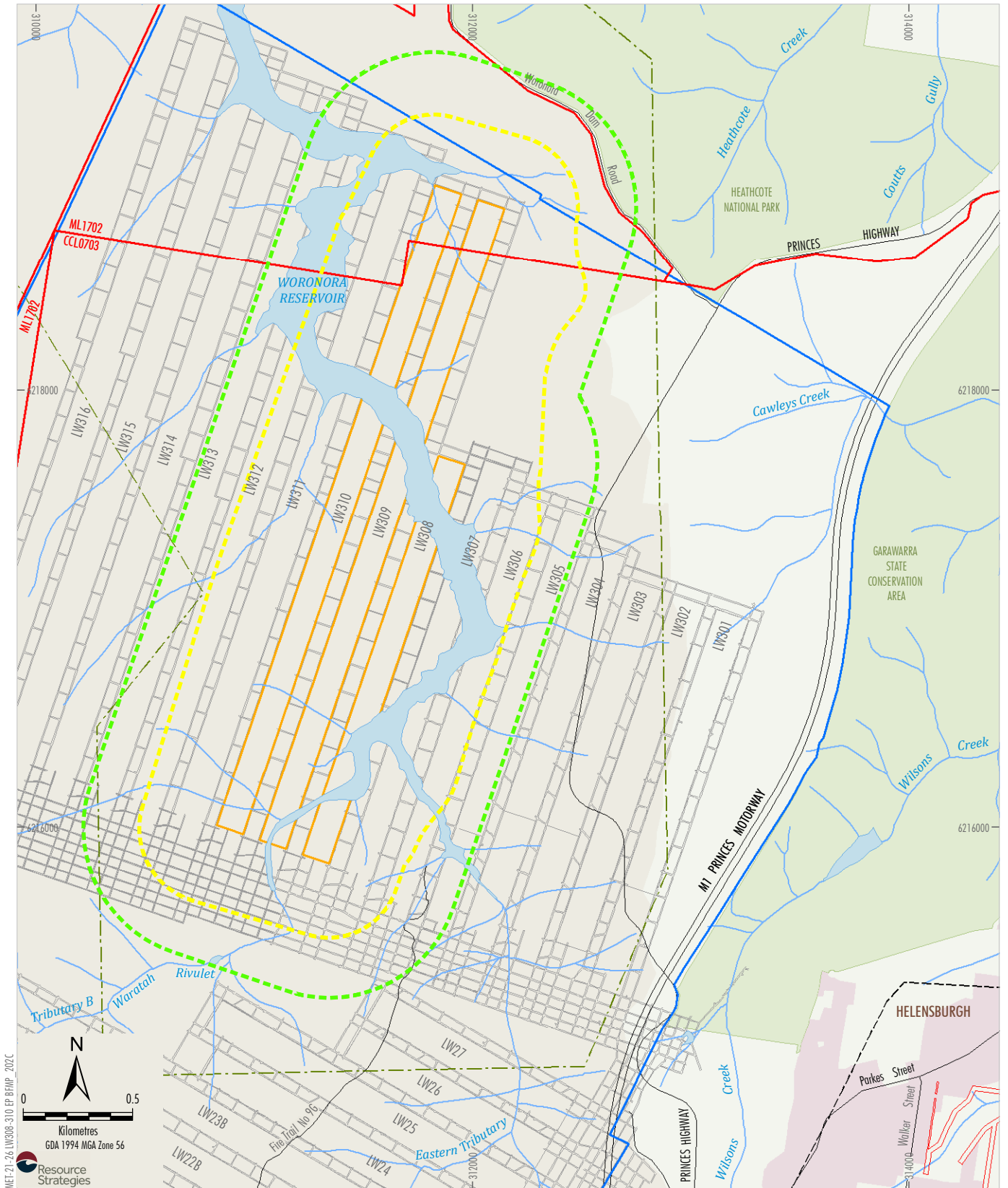
MET-21-26 LW308-310 EP BEMP 201C
Resource Strategies

- LEGEND**
- Mining Lease Boundary
 - Woronora Special Area
 - Railway
 - Project Underground Mining Area Longwalls 20-27 and 301-317
 - Longwalls 308-310 Secondary Extraction
 - Longwalls 308-310 35° Angle of Draw and/or Predicted 20 mm Subsidence Contour
 - 600 m from Longwalls 308-310 Secondary Extraction
 - Woronora Notification Area
 - Existing Underground Access Drive (Main Drift)

Source: Land and Property Information (2015); Department of Industry (2015); Metropolitan Coal (2021); MSEC (2021)

Peabody
METROPOLITAN COAL
Longwalls 308-310 and
Project Underground Mining Area

Figure 1



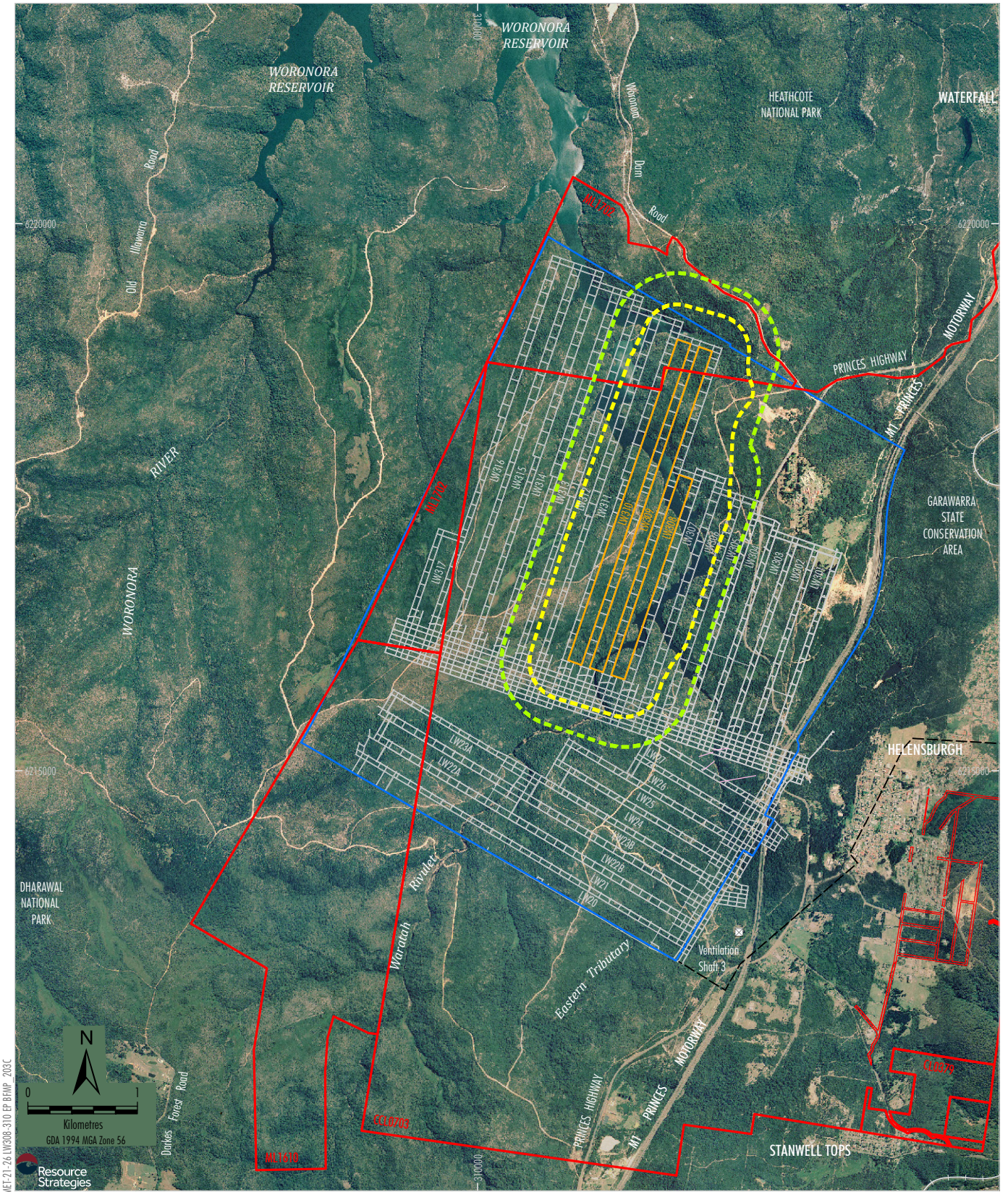
LEGEND

- Mining Lease Boundary
- Woronora Special Area
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Longwalls 20-27 and 301-317
- Longwalls 308-310 Secondary Extraction
- Longwalls 308-310 35° Angle of Draw and/or
Predicted 20 mm Subsidence Contour
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Secondary Extraction
- Woronora Notification Area
- Existing Underground Access Drive (Main Drift)

Source: Land and Property Information (2015); Department of Industry (2015);
Metropolitan Coal (2021); MSEC (2021)

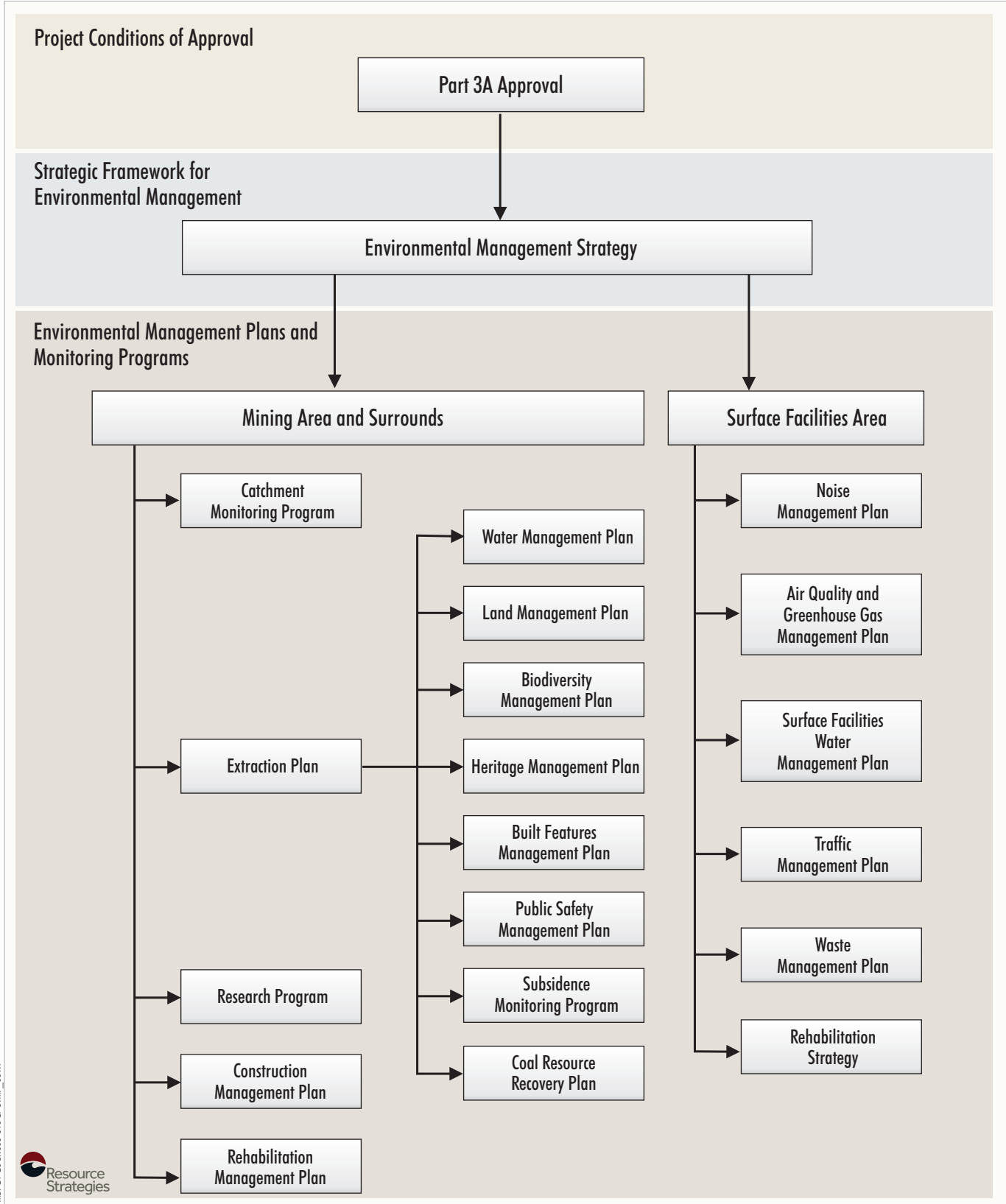
Peabody
METROPOLITAN COAL
Longwalls 308-310 Layout

Figure 2



Peabody
METROPOLITAN COAL
Longwalls 308-310 and
Project Underground Mining Area -
Aerial Photograph

Figure 3



MEF-21-26 LW308-310 EP BRMP_001A

Figure 4

- Section 8: Describes the management measures that will be implemented.
- Section 9: Provides a contingency plan to manage any unpredicted impacts and their consequences.
- Section 10: Describes the Trigger Action Response Plan (TARP) management tool.
- Section 11: Describes the program to collect sufficient baseline data for future Extraction Plans.
- Section 12: Describes the annual review and improvement of environmental performance.
- Section 13: Outlines the management and reporting of incidents.
- Section 14: Outlines the management and reporting of complaints.
- Section 15: Outlines the management and reporting of non-compliances with statutory requirements.
- Section 16: Lists the references cited in this BFMP-WCC.

2 BFMP-WCC REVIEW AND UPDATE

In accordance with Condition 4, Schedule 7 of the Project Approval, this BFMP-WCC will be reviewed within three months of the submission of:

- an audit under Condition 8, Schedule 7;
- an incident report under Condition 6, Schedule 7;
- an annual review under Condition 3, Schedule 7; and
- if necessary, revised to the satisfaction of the Director-General (now Secretary) of the DPIE, to ensure the plan is updated on a regular basis and to incorporate any recommended measures to improve environmental performance.

This BFMP-WCC will also be reviewed within three months of approval of any Project modification and if necessary, revised to the satisfaction of the DPIE.

The revision status of this plan is indicated on the title page of each copy of the BFMP-WCC. The distribution register for controlled copies of the BFMP-WCC is described in Section 2.1.

Revisions to any documents listed within this BFMP-WCC will not necessarily constitute a revision of this document.

2.1 DISTRIBUTION REGISTER

In accordance with Condition 10, Schedule 7 'Access to Information', Metropolitan Coal will make the BFMP-WCC publicly available on the Peabody website. A hard copy of the BFMP-WCC will also be maintained at the Metropolitan Coal site.

Metropolitan Coal recognises that various regulators have different distribution requirements, both in relation to whom documents should be sent and in what format.

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An Environmental Management Plan and Monitoring Program Distribution Register has been established in consultation with the relevant agencies and infrastructure owners that indicates:

- to whom the Metropolitan Coal plans and programs, such as the BFMP-WCC, will be distributed;
- the format (i.e. electronic or hard copy) of distribution; and
- the format of revision notification.

Metropolitan Coal will make the Distribution Register publicly available on the Peabody website.

Metropolitan Coal will be responsible for maintaining the Distribution Register and for ensuring that the notification of revisions is sent by email or post as appropriate.

In addition, Metropolitan Coal employees with local computer network access will be able to view the controlled electronic version of this BFMP-WCC on the Metropolitan Coal local area network. Metropolitan Coal will not be responsible for maintaining uncontrolled copies beyond ensuring the most recent version is maintained on Metropolitan Coal’s computer system and the Peabody website.

3 STATUTORY REQUIREMENTS

Metropolitan Coal’s statutory obligations are contained in:

- (i) the conditions of the Project Approval;
- (ii) relevant licences and permits, including conditions attached to mining leases; and
- (iii) other relevant legislation.

These are described below.

3.1 EP&A ACT APPROVAL

Condition 6(f), Schedule 3 of the Project Approval requires the preparation of a BFMP as a component of Extraction Plan(s) for second workings. Project Approval Condition 6(f), Schedule 3 states:

SECOND WORKINGS

Extraction Plan

6. *The Proponent shall prepare and implement an Extraction Plan for all second workings in the mining area to the satisfaction of the Director-General. This plan must:*

...

(f) *include a:*

...

- *Built Features Management Plan, which has been prepared in consultation with the owner of the relevant feature, to manage the potential environmental consequences of the Extraction Plan on any built features;*

In addition, Condition 2, Schedule 7 and Condition 7, Schedule 3 of the Project Approval outline management plan requirements that are applicable to the preparation of the BFMP-WCC. Table 1 indicates where each component of the conditions are addressed within this BFMP-WCC.

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**Table 1
Management Plan Requirements**

Project Approval Condition	BFMP-WCC Section
Condition 2 of Schedule 7	
2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	
a) detailed baseline data;	Section 6
b) a description of:	
• the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 3
• any relevant limits or performance measures/criteria;	Section 5
• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	Section 5
c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Sections 7, 8, 9 and 10
d) a program to monitor and report on the:	Sections 7, 8 and 12
• impacts and environmental performance of the project;	
• effectiveness of any management measures (see c above);	
e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 9 and Appendix 4
f) a program to investigate and implement ways to improve the environmental performance of the project over time;	Sections 7 and 12
g) a protocol for managing and reporting any:	
• incidents;	Section 13
• complaints;	Section 14
• non-compliances with statutory requirements; and	Section 15
• exceedances of the impact assessment criteria and/or performance criteria; and	Section 9 and Appendix 4
h) a protocol for periodic review of the plan.	Section 2
Condition 7 of Schedule 3	
7. In addition to the standard requirements for management plans (see condition 2 of schedule 7), the Proponent shall ensure that the management plans required under condition 6(f) above include:	
a) a program to collect sufficient baseline data for future Extraction Plans;	Section 11
b) a revised assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this approval;	Section 4
c) a detailed description of the measures that would be implemented to remediate predicted impacts; and	Section 8
d) a contingency plan that expressly provides for adaptive management.	Section 9 and Appendix 4

3.2 LICENCES, PERMITS AND LEASES

In addition to the Project Approval, all activities at or in association with the Metropolitan Coal Mine will be undertaken in accordance with the following licences, permits and leases which have been issued or are pending issue:

- The conditions of mining leases issued by the NSW Division of Resources and Geoscience (DRG) (now Mining, Exploration and Geoscience [MEG]), under the NSW *Mining Act 1992* (e.g. Consolidated Coal Lease [CCL] 703, Mining Lease [ML] 1610, ML 1702, Coal Lease [CL] 379 and Mining Purpose Lease 320).
- The *Metropolitan Coal Mining Operations Plan 1 October 2021 to 30 September 2023* approved by the Resources Regulator.
- The conditions of Environment Protection Licence (EPL) No. 767 issued by the NSW Environment Protection Authority (EPA) under the NSW *Protection of the Environment Operations Act 1997*. Revision of the EPL will be required prior to the commencement of Metropolitan Coal activities that differ from those currently licensed.
- The prescribed conditions of specific surface access leases within CCL 703 for the installation of surface facilities as required.
- Water Access Licences (WALs) issued by the NSW Department of Industry – Water (now DPIE – Water) under the NSW *Water Management Act 2000*, including WAL 36475 under the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011* and WAL 25410 under the *Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011*.
- Mining and workplace health and safety related approvals granted by the Resources Regulator and WorkCover NSW.
- Supplementary approvals obtained from WaterNSW for surface activities within the Woronora Special Area (e.g. fire road maintenance activities).

3.3 OTHER LEGISLATION

Metropolitan Coal will conduct the Project consistent with the Project Approval and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act.

The following Acts may be applicable to the conduct of the Project (Helensburgh Coal Pty Ltd [HCPL], 2008)²:

- *Biodiversity Conservation Act 2016*;
- *Biosecurity Act 2015*;
- *Contaminated Land Management Act 1997*;
- *Crown Land Management Act 2016*;
- *Dams Safety Act 2015*;
- *Dangerous Goods (Road and Rail Transport) Act 2008*;
- *Energy and Utilities Administration Act 1987*;

² The list of potentially applicable Acts has been updated to reflect changes to the Acts that were in force at the time of submission of the Metropolitan Coal Project Environmental Assessment (Project EA) (HCPL, 2008).

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- *Fisheries Management Act 1994;*
- *Mining Act 1992;*
- *Protection of the Environment Operations Act 1997;*
- *Rail Safety (Adoption of National Law) Act 2012;*
- *Roads Act 1993;*
- *Water Act 1912;*
- *Water Management Act 2000;*
- *Water NSW Act 2014;*
- *Work Health and Safety Act 2011; and*
- *Work Health and Safety (Mines and Petroleum Sites) Act 2013.*

Relevant licences or approvals required under these Acts will be obtained as required.

4 REVISED ASSESSMENT OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

4.1 EXTRACTION LAYOUT

Longwalls 308-310 and the area of land within 600 metres (m) of Longwalls 308-310 secondary extraction are shown on Figures 2 and 3. Longwall extraction will occur from north to south. The layout of Longwalls 308 and 309 include 138 m panel widths (void) and 70 m pillar widths (solid). The layout of Longwall 310 includes a 138 m panel width (void) and a 70 m tailgate pillar width. Approximately 1,370 m from the commencing end of Longwall 310, the maingate pillar width of Longwall 310 decreases from 70 m to 45 m until the finishing end of Longwall 310 (Figure 2).

The provisional extraction schedule for Longwalls 308-310 is provided in Table 2.

Table 2
Provisional Extraction Schedule

Longwall	Estimated Start Date	Estimated Duration	Estimated Completion Date
Longwall 308	February 2023	7 Months	August 2023
Longwall 309	September 2023	11 Months	July 2024
Longwall 310	August 2024	12 Months	July 2025

The future Extraction Plans will consider the cumulative subsidence effects, subsidence impacts and/or environmental consequences. Note that the total cumulative predicted subsidence effects, subsidence impacts and/or environmental consequences at the completion of the Project are considered in the Metropolitan Coal Project Environmental Assessment (Project EA) (HCPL, 2008) and the Preferred Project Report (HCPL, 2009).

4.1.1 Wollongong City Council Assets

Figure 5 illustrates the Wollongong City Council assets in relation to Longwalls 308-310 extraction. The assets include:

- Old Princes Highway, including:
 - pavement;
 - drainage structures (e.g. pipes, culverts); and
 - guard rails, marker posts and signage.

4.2 REVISED SUBSIDENCE AND IMPACT PREDICTIONS

4.2.1 Revised Subsidence Predictions

Subsidence predictions for Longwalls 20-44 in relation to the Wollongong City Council assets were conducted by MSEC (2008) as part of the Metropolitan Coal Project EA. MSEC (2008) includes a table summarising the incremental systematic subsidence parameters for the extraction of each longwall from Longwalls 20-44. These include:

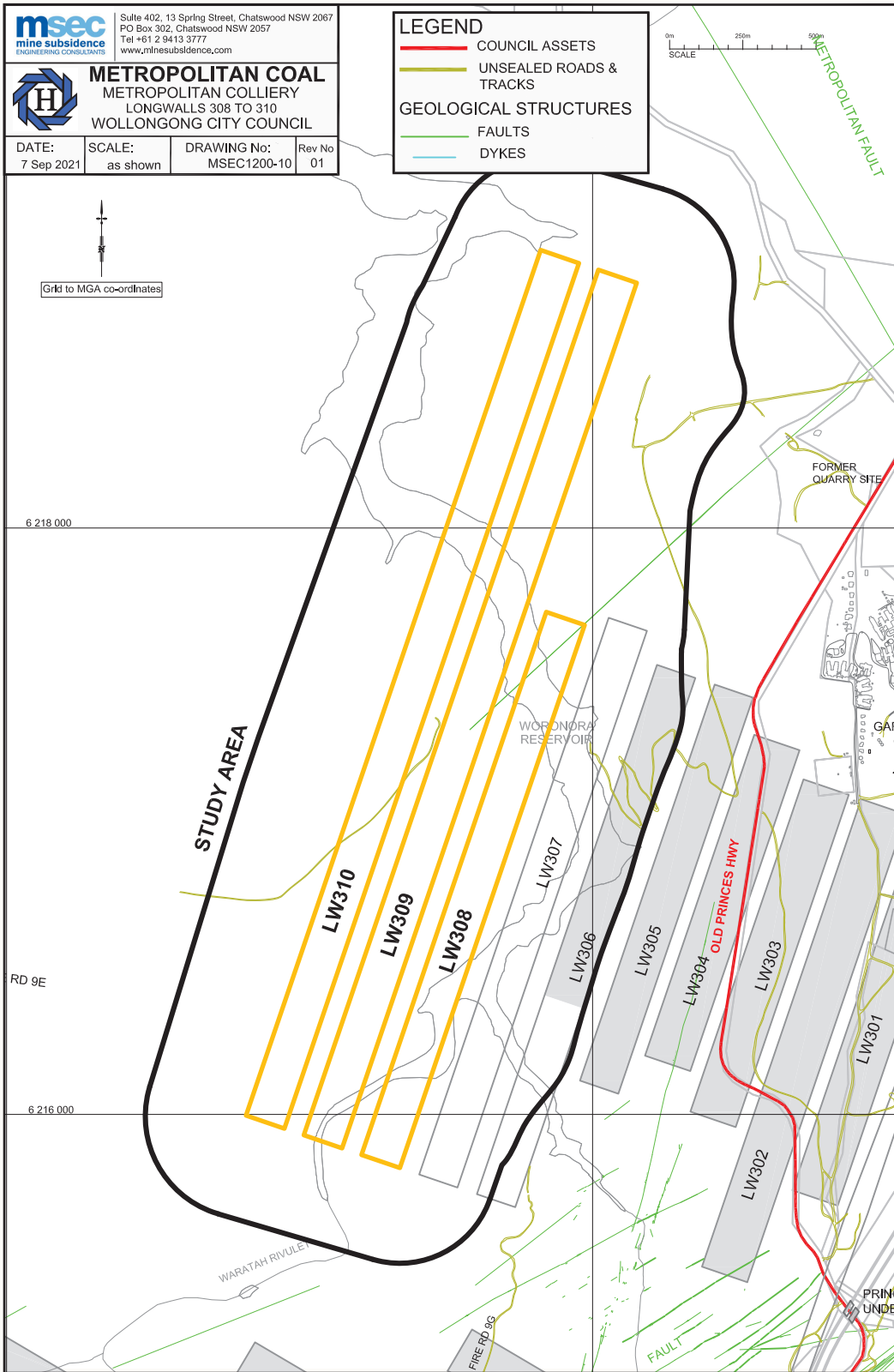
- maximum predicted incremental subsidence (vertical movement);
- maximum predicted incremental tilt along alignment;
- maximum predicted incremental tilt across alignment;
- maximum predicted incremental tensile strain; and
- maximum predicted incremental compressive strain.

Revised subsidence and impact predictions for the extraction of Longwalls 308-310 on Wollongong City Council assets were conducted by MSEC and reported in MSEC (2021) (Appendix 1).

In relation to subsidence predictions for Longwalls 308-310, MSEC (2021) make the following conclusions:

- The Princes Highway crosses directly above previous Longwalls 301 to 304, but does not cross directly above Longwalls 308-310. The highway at a distance of 630 m or more from Longwalls 308-310 is located entirely outside the study area and is not expected to experience measurable conventional vertical subsidence, tilts, curvatures or strains (i.e. no greater than survey accuracy). This section of the highway comprises single and dual carriageway with a flexible asphalt pavement and grass verges.
- The Old Princes Highway does not cross any major streams within the Study Area. The highway, therefore, is not expected to experience any measurable valley closure effects.
- Whilst the highway could experience low level far-field horizontal movements, the associated tilts, curvatures or strains are not expected to be measurable.

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ME1-19-19_305-309 EP BFMF_010C

Source: MSEC (2021)



METROPOLITAN COAL
Wollongong City Council Assets
(Old Princes Highway)

Figure 5

- Approximately 1.7 km of the highway has been mined beneath by Longwalls 301 to 304. Minor tensile cracking impact to the pavement has been observed, predominantly adjacent to the commencing end of Longwall 305. An elevated tensile strain was observed at this location during the extraction of Longwalls 305 and 306. The location of the tensile cracking has a history of deterioration prior to longwall mining. Remediation of the tensile cracks has been undertaken.
- The Princes Highway is 630 m or more from Longwalls 308 to 310. Impacts to the highway are considered unlikely to occur at this distance. It is expected that the highway can be maintained in safe and serviceable conditions with the implementation of the appropriate monitoring and management strategies.

4.2.2 Risk Assessment

In accordance with the *Guidelines for the Preparation of Extraction Plans* (DP&E and DRE, 2015) a risk assessment meeting was held for Longwall 301-303 on 15 August 2016. Attendees at Longwalls 301-303 risk assessment meeting included representatives from Metropolitan Coal, Wollongong City Council, MSEC and Axys Consulting (risk assessment facilitator).

The investigation and analysis methods used during the risk assessment included:

- identification of Wollongong City Council assets;
- review of the revised subsidence predictions and potential impacts on Wollongong City Council assets (including consideration of experience from Longwall 301-303 extraction); and
- development of a monitoring plan and management decision tree.

A number of risk control measures and procedures were identified during the initial risk assessment in 2016 which considered the extraction of coal beneath the Wollongong City Council assets. The risk control measures and procedures were incorporated into the Longwalls 301-303 BFMP.

The risk control measures and procedures identified and implemented during the risk assessment for Longwalls 301-303 were continued for the extraction of Longwalls 304-307. At the request of the Wollongong City Council, the Longwalls 305-307 BFMP-WCC included a traffic control plan to divert traffic off the Princes Highway due to any unforeseen circumstances. This traffic control plan is provided in Appendix 2.

A review for Longwall 305-307 was held on 2 October 2019, attendees at the risk review included representatives from Metropolitan Coal, Wollongong City Council and MSEC.

The Princes Highway is located outside the study area of Longwalls 308-310, with no further subsidence predicted after the extraction of Longwall 306. It has been agreed by WCC and Metropolitan Coal to continue the Built Feature Management Plan to include monitoring for Longwall 308 to confirm cessation of subsidence.

The risk control measures and procedures in place for Longwall 301-307 are considered suitable to be continued for the extraction of Longwall 308-310.

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5 PERFORMANCE MEASURES AND INDICATORS

The Project Approval requires Metropolitan Coal not to exceed the subsidence impact performance measures outlined in Table 1 of Condition 1, Schedule 3. The subsidence impact performance measure specified in Table 1 of Condition 1, Schedule 3 in relation to built features is:

Safe, serviceable and repairable, unless the owner and the MSB agree otherwise in writing.

The performance indicators proposed to ensure that the above performance measure is achieved include:

- no pavement cracking exceeding 10 millimetres (mm), or other defects of the road pavement resulting in deterioration of ride quality;
- no ponding of water on the road surface as a result of changes in grade from subsidence associated with Longwalls 308-310;
- no joint displacement or cracking or other defects of the drainage structure (e.g. pipes/culverts) in excess of 5 mm; and
- serviceability of guard rails, marker posts and signage are maintained.

Section 7 of this BFMP-WCC describes the monitoring that will be conducted to assess the Project against the above performance indicators and performance measure. Sections 8 and 9 of this BFMP-WCC provides management measures and a Contingency Plan in the event the performance measure is exceeded.

6 BASELINE DATA

The Old Princes Highway is shown on Plate 1.



Plate 1 – Old Princes Highway (Source: MSEC, 2016)

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A baseline visual audit will be completed at the end of Longwall 306 for the future incremental comparison of LW308-310 with no further measurable subsidence expected beyond this longwall.

6.1 KEY CONTACTS LIST

The list of key contacts for Peabody and Wollongong City Council during the development and implementation of this BFMP are provided in Table 3.

**Table 3
List of Key Contacts**

Company	Position	Contact
Peabody (Metropolitan Coal)	Jon Degotardi Technical Services Manager	Metropolitan Coal 24hr Control Room 02 4294 7333
Wollongong City Council	Nur Joy Civil Asset Management Unit Leader	Wollongong City Council 24hr Contact Number 02 4227 7111
	Peter Tobin Senior Geotechnical Engineer	
	Alan Davis City Maintenance Manager	
	Fred Siasat Civil Coordinator - North Works	
	Alan Davis Manager - Maintenance	
	Fred Siasat Coordinator North	
Traffic Logistics	Afterhours Call Out Traffic Control	Traffic Logistics 24hr 02 4271 4999
Roadworx	Afterhours Call Out Road works	Roadworx 02 4224 0222
NSW Police	Emergency Call Centre	Police 24hr 000

In the event of an emergency situation from a sudden major subsidence impact and the Princes Highway is not safely trafficable due to the impact, the following contacts would be notified:

1. NSW Police (000) to temporarily apply and enforce a speed restriction or road closure until traffic control can be implemented.
2. Traffic Control Company, (Traffic Logistics 02 4271 4999), to setup pre planned speed reduction controls or road closure/traffic diversion to enable road restoration works.
3. Metropolitan Coal to organise highway repair, (Roadworx 02 4224 0222), to restore pavement to normal trafficable conditions.
4. Wollongong City Council, (Local Emergency Manager 4227 7111), would be notified of the situation.

7 MONITORING

A monitoring program will be implemented to monitor the impacts of the Project on the Wollongong City Council assets. Table 4 summarises the BFMP-WCC monitoring components.

Where relevant, inspections of subsidence impacts will include photographic record of the impacts for comparison with baseline photographic records.

The Wollongong City Council or their delegates will conduct the various visual inspections. Metropolitan Coal will be notified of the timing of inspections and accompany the Wollongong City Council or delegates if considered necessary. All personnel will complete necessary inductions or orientation relevant to the tasks required.

**Table 4
BFMP-WCC Monitoring Program Overview**

Program	Aspect	Method	How	Why	Timing	Frequency
Baseline	Ground	Survey	Adjacent Old Princes Highway subsidence line points at approximately 20 m spacing	Establish base conditions Full extents of Old Princes Highway subsidence line	Prior to Longwall 308	Once
	Pavement	Photography and other available baseline information		Establish base condition		Once
	Drainage structures & other road furniture	Visual inspection of the drainage structures, guard rails, marker posts and signage		Establish base condition		Once
During mining	Ground	Survey	Adjacent Old Princes Highway subsidence line points at approximately 20 m spacing within zone of active subsidence	Monitor subsidence effects during mining (subsidence, tensile strain, compressive strain)	On commencement of LW308 at PH30 & PH32 to confirm no sustained increase in incremental tensile strain	Fortnightly on commencement for LW308 at PH30 & PH32
			Full extents of Old Princes Highway subsidence line		At the completion of Longwall 308	Once

Table 4 (Continued)
BFMP-WCC Monitoring Program Overview

Program	Aspect	Method	How	Why	Timing	Frequency
During Mining (cont.)	Pavement, drainage structures & other road furniture	Visual inspection by Metropolitan Coal		Pavement to identify the development of, or changes in existing pavement including cracks, buckling and stepping. Drainage structures to identify changes to the visible surfaces of the structures including cracking, buckling, shearing, and collapse, and impacts to furniture	At the completion of Longwalls 308 Full extents of Old Princes Highway subsidence line	Once
					During the extraction of Longwalls 308	Quarterly
Post Mining	Ground	Survey full extents of Old Princes Highway subsidence line		Determine level of impact of mining (if any)	Within 3 months of the completion of Longwall 308	Once
	Pavement, drainage structures and other furniture	Visual inspection and condition report by Metropolitan Coal Full extents of Old Princes Highway subsidence line		Determine level of impact of mining (if any)	Within 3 months of the completion Longwall 308	Once
		Visual inspection during Wollongong City Council routine inspections		Validation	Next scheduled post Longwall 308	Once

The frequency of monitoring will be reviewed either:

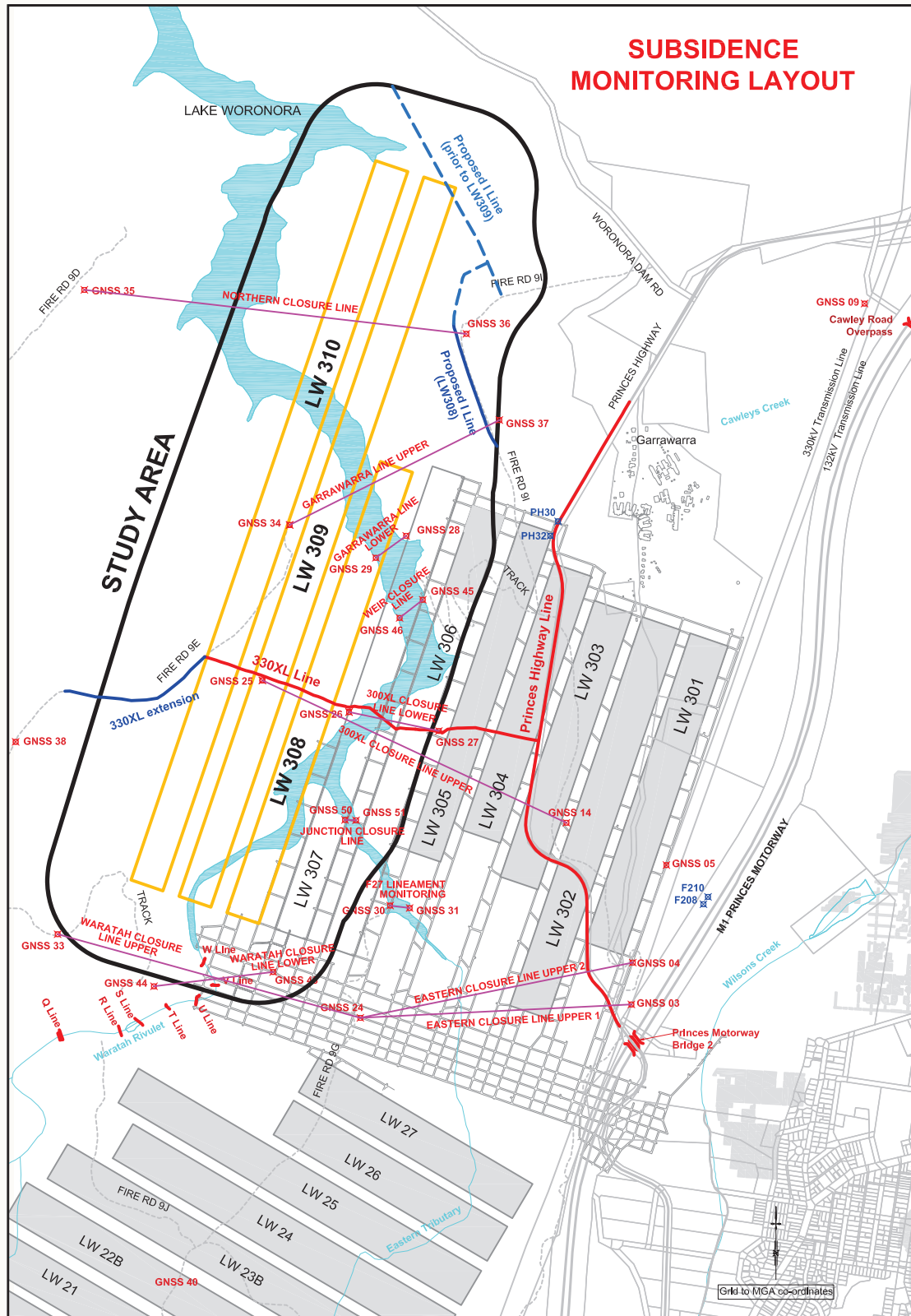
- in accordance with the Annual Review outlined in Section 12; or
- if triggered as a component of the Contingency Plan as outlined in Section 9 of this BFMP-WCC.

7.1 SUBSIDENCE PARAMETERS

Subsidence parameters (i.e. subsidence, tensile strain, compressive strain, absolute horizontal translation) associated with mining will be measured in accordance with the Longwall 308-310 Subsidence Monitoring Program (Figure 6).

In summary, surveys will be conducted to measure subsidence movements in three dimensions using a total station survey instrument. Subsidence movements (i.e. subsidence, tilt, tensile strain and compressive strain) will be measured along subsidence lines that have been positioned across the general landscape.

Monitoring of subsidence parameters specific to the Wollongong City Council assets include the survey line along the Old Princes Highway. These surveys will monitor the general movement about the longwalls and the data will allow evaluation of the likely ground movements about the Old Princes Highway (by comparison between measured and predicted movements).



MET-21-26 LW308-310 EP BMP_017A

Source: MSEC (2021)

Figure 6

7.2 SUBSIDENCE IMPACTS

7.2.1 Pavement

Metropolitan Coal will undertake an inspection of the pavement prior to the commencement of Longwall 308 and thereafter fortnightly if the area being monitored at PH30-32 develops strain measurements above survey tolerance. An inspection of the full extents of the pavement monitoring, Garrawarra to Bridge 2, will occur within three months of the completion of Longwall 308. Metropolitan Coal will provide the visual inspections report to the Wollongong City Council for review.

Wollongong City Council will conduct additional observations of subsidence impacts during routine works and routine (quarterly) road condition inspections if deemed required by Wollongong City Council.

Specific details that will be noted and/or photographed include:

- the date of the inspection;
- the location of longwall extraction (i.e. the longwall chainage);
- assessment against the performance indicators and performance measure;
- whether any actions are required (e.g. initiation of the Contingency Plan, incident notification, implementation of appropriate safety controls, review of public safety, etc.); and
- any other relevant information.

The information will be recorded in the Built Features Management Plan - Subsidence Impact Register (Appendix 3) and reported in accordance with the Project Approval conditions.

7.2.2 Drainage Structures (Pipes/Culverts)

An inspection of the drainage structures (e.g. pipes/culverts) within the Study area will be carried out to provide an assessment of the baseline condition of these features prior to the longwall 308 (or as otherwise agreed with the Wollongong City Council). The inspections will be organised by Metropolitan Coal with the inspection footage and report to be supplied to the Wollongong City Council. The inspection will include:

- recording of existing cracks; and
- recording of other defects such as joint displacement and general condition.

Metropolitan Coal will organise another inspection to assess changes to the pipes/culverts from the baseline condition as a result of the extraction of Longwall 308. A site inspection of the pipes/culverts will also occur following the completion of Longwall 308. The visual assessment will be carried out by representative(s) from the Wollongong City Council and representative(s) from the Metropolitan Coal, if deemed required by the Wollongong City Council.

The information will be recorded in the Built Features Management Plan - Subsidence Impact Register (Appendix 3) and reported in accordance with the Project Approval conditions.

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7.2.3 Guard Rails, Marker Posts and Signage

Pre and post audits of guard rails, marker posts and signage will be conducted using the results of the dilapidation survey described in Section 6 and recorded following the completion of Longwalls 308 to assess changes from the baseline condition.

7.3 ENVIRONMENTAL CONSEQUENCES

Metropolitan Coal will compare the results of the subsidence impact monitoring against the built features performance measure and performance indicators. Wollongong City Council will review and endorse the findings of the comparison. In the event the observed subsidence impacts exceed the performance measure or performance indicators, Metropolitan Coal will assess the consequences of the exceedance in accordance with the Contingency Plan described in Section 9. Metropolitan Coal will inform of the exceedance and propose treatment measure to the Wollongong City Council. The Wollongong City Council will review and endorse the treatment plan.

8 MANAGEMENT MEASURES

A number of potential management measures in relation to pavement, drainage structures and other furniture are considered to be applicable and are described below.

Follow-up inspections will be conducted to assess the effectiveness of the management measures implemented and the requirement for any additional management measures.

Management measures will be reported in the Annual Review (Section 12).

8.1 ROAD PAVEMENTS

The potential management measures in relation to the Old Princes Highway pavement include:

- mill and/or replace pavement layers; and
- crack sealing/repair.

In the event that repairs are required, traffic control measures such as contra-flow of traffic or partial carriageway closures may be used to divert traffic off one carriageway, lane or shoulder. Repairs would be carried out as soon as practicable in consultation with the Wollongong City Council.

8.2 DRAINAGE STRUCTURES (PIPES/CULVERTS)

The potential management measures in relation to drainage structures (pipes/culverts) include:

- point repairs;
- replace sections of pipe/culvert; and
- grouting/sealing of cracks.

In the event that repairs are required, traffic control measures such as contra-flow of traffic or partial carriageway closures may be used to divert traffic off one carriageway, lane or shoulder. Repairs would be carried out as soon as practicable in consultation with the Wollongong City Council.

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8.3 GUARD RAILS, MARKER POSTS AND SIGNAGE

The potential management measures in relation to guard rails, marker posts and signage include repairs and/or replacement of furniture.

In the event that repairs are required, traffic control measures such as contra-flow of traffic or partial carriageway closures may be used to divert traffic off one carriageway, lane or shoulder. Repairs would be carried out as soon as practicable in consultation with the Wollongong City Council.

9 CONTINGENCY PLAN

In the event the subsidence impacts observed exceed the performance measure or performance indicators detailed in Section 5 of this BFMP-WCC, Metropolitan Coal will implement the following Contingency Plan (Appendix 4):

- The observation will be reported to the Technical Services Manager within 24 hours.
- The observation will be recorded in the Built Features Management Plan - Subsidence Impact Register (Appendix 3) consistent with the monitoring program described in Section 7 of this BFMP-WCC.
- Metropolitan Coal will report any exceedance of the performance measure or performance indicators to the DPIE and Wollongong City Council as soon as practicable after Metropolitan Coal becomes aware of the exceedance.
- Metropolitan Coal will assess public safety and where appropriate implement safety measures in accordance with the Metropolitan Coal Longwalls 308-310 Public Safety Management Plan.
- Metropolitan Coal will conduct an investigation to evaluate the potential contributing factors. The investigation will:
 - include the re-survey of relevant subsidence monitoring lines;
 - compare and critically analyse measured versus predicted subsidence parameters;
 - review measured subsidence parameters against the observed impact; and
 - review the subsidence monitoring program and update the program where appropriate.
- The course of action with respect to the identified impact(s), in consultation with specialists and relevant agencies, will include:
 - a program to review the effectiveness of the contingency measures; and
 - consideration of adaptive management.
- Contingency measures are provided in Section 9.1.
- Metropolitan Coal will submit the proposed course of action to the DPIE for approval.
- Metropolitan Coal will implement the approved course of action to the satisfaction of the DPIE.

In accordance with Condition 6, Schedule 6 of the Project Approval, Metropolitan Coal will provide a suitable offset to compensate for the impact to the satisfaction of the Secretary of DPIE if either the contingency measures implemented by Metropolitan Coal have failed to remediate the impact or the Secretary determines that it is not reasonable or feasible to remediate the impact.

Metropolitan Coal will comply with the NSW *Coal Mine Subsidence Compensation Act 2017* in the event that property damages occur as a result of mining Longwalls 308-310.

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9.1 CONTINGENCY MEASURES

Contingency measures will be developed in consideration of the specific circumstances of the feature (e.g. the location, nature and extent of the impact, and the assessment of environmental consequences).

Contingency measures that could be considered in the event the performance measure for the Old Princes Highway is exceeded are summarised in Table 5. The decision trees for the contingency measures are shown in Appendix 4.

**Table 5
Contingency Measures – Old Princes Highway**

Environmental Consequence	Contingency Measures	
	Measure	Description
Impact on:		
Pavement	Rebuild road.	<ul style="list-style-type: none"> Temporary closure of the road and reconstruction of pavement.
Pipes/Culverts	Replace pipe. Rebuild culvert.	<ul style="list-style-type: none"> Construction of temporary drainage pipe/culvert and reconstruction or replacement of original pipe/culvert.
Other Furniture (Guard Rail, Marker Posts, Signage)	Replace furniture.	<ul style="list-style-type: none"> Replace section of guard rail, marker post or signage.

Temporary road closure and speed reduction traffic control plans are included in the appendices.

10 TARP – MANAGEMENT TOOL

The framework for the various components of the BFMP-WCC are summarised in the BFMP-WCC TARP shown in Table 6. The BFMP-WCC TARP illustrate how the various predicted subsidence impacts, monitoring components, performance measures, and responsibilities are structured to achieve compliance with the relevant statutory requirements, and the framework for management and contingency actions.

The TARP comprises:

- baseline conditions;
- predicted subsidence impacts;
- trigger levels from monitoring to assess performance; and
- triggers that flag implementation of contingency measures.

The TARP system provides a simple and transparent snapshot of the monitoring of environmental performance and the implementation of management and/or contingency measures.

**Table 6
Trigger Action Response Plan – Old Princes Highway**

Performance Measure	Performance Indicator	Monitoring Site(s)	Parameters	Frequency	Analysis Methodology	Error Types	Significance Levels/ Triggers		Action/Response	
							Level 1	LW 308#		
Safe, serviceable and repairable	Subsidence parameters.	Old Princes Highway	Subsidence Strains Tensile & Compressive	Fortnightly at PH30 and PH32 on commencement of LW308 to confirm no further subsidence Full Highway after LW308 EOP	Comparison between predicted and measured subsidence	Subsidence measurement accuracy.	Level 1	LW 308#	Measured subsidence parameters generally in accordance with predictions Continue monitoring and reporting. <i>*Note: No further measurable subsidence is predicted beyond LW306 for future longwall extractions.</i> <i># Survey positional accuracy is ±30mm for vertical & 0.5 mm/m for strains</i>	
							Subsidence	No discernible change from EOP LW306 measurements		
							Tensile strain			
							Compressive strain			
	Integrity of the pavement and drainage structures (pipes, culverts and other furniture).			Direct signs of movement, about the pavement of drainage structures	Fortnightly at PH30 and PH32 on commencement of LW308 to confirm no further subsidence Full Highway after LW308 EOP	Photography Visual inspection	Consistency of photography and experienced person inspecting road	Level 2	LW 308	Subsidence effects up to 15% more than predicted Metropolitan Coal Resurvey area within 1 week to confirm results. Engage subsidence expert to assess results. Inform and provide report to WCC of subsidence results. Collaboratively share information with WCC to monitor situation. WCC Assess information provided by Metropolitan Coal.
								Subsidence	> than survey tolerance measured incrementally beyond EOP LW306	
								Tensile strain		
								Compressive strain		
								Visual	Negligible visible impact to pavement or drainage structures	
								Level 3	LW 308	Anomalous subsidence greater than 15% above predictions Metropolitan Coal Immediately assess area of highway for continued safe operation NSW Police apply and enforce speed restriction, and determine if a detour is necessary. Inform WCC and NSW Principal Subsidence Engineer of subsidence results (immediately following awareness of trigger). Request WCC assess asset condition. Increase frequency of subsidence line surveys to weekly in affected area. Report monitoring data to NSW Principal Subsidence Engineer Review the subsidence monitoring program and update the program where appropriate. Provide report on issue to both WCC and DPIE. WCC In conjunction with Metropolitan Coal, inspect road pavement, assess condition and determine appropriate response (e.g. greater monitoring data or frequency, or schedule maintenance on the road pavement/structure).
								Subsidence	> than survey tolerance measured incrementally beyond EOP LW306 and Level 3 visual impact observed.	
								Tensile strain		
Compressive strain										
Visual	Visible subsidence impact: <ul style="list-style-type: none"> • Pavement cracking > 10 mm; • Minor water ponding; • Drainage structure cracking ~ 5 mm; and • Greater than minor defects to guard railing, marker posts, or signage. 									

Table 6 (continued)
Trigger Action Response Plan – Old Princes Highway

Performance Measure	Performance Indicator	Monitoring Site(s)	Parameters	Frequency Sample Size	Analysis Methodology	Error Types	Significance Levels/ Triggers		Action/Response
							Level 4	Response	
Safe, serviceable and repairable (cont)	Integrity of the pavement and drainage structures (pipes, culverts and other furniture) (cont)	Old Princes Highway	Direct signs of movement, about the pavement of drainage structures	Fortnightly at PH30 and PH32 on commencement of LW308 to confirm no further subsidence Full Highway after LW308 EOP	Photography Visual inspection	Consistency of photography and experienced person inspecting road	Level 4	<p>Response</p> <p>Metropolitan Coal Implement Contingency Plan as per BFMP Section 9. In event of an emergency situation from a sudden major subsidence impact and the Princes Highway is not safely trafficable due to the impact, the following contacts would be notified by Metropolitan Coal;</p> <ol style="list-style-type: none"> 1. NSW Police (000) to temporarily apply and enforce a speed restriction or road closure until traffic control can be implemented. 2. Traffic Control Company, (Traffic Logistics 02 4271 4999), to setup pre planned speed reduction controls or road closure/traffic diversion to enable road restoration works. 3. Metropolitan Coal to organise highway repair, (Roadworx 02 4224 0222), to restore pavement to normal trafficable conditions. 4. Wollongong City Council, (Local Emergency Manager 4227 7111), would be notified of situation. <p>Metropolitan will also notify Wollongong City Council civil asset management unit leader, NSW Principal Subsidence Engineer, DPIE and Subsidence Advisory NSW of the Level 4 situation within 24hrs. Update the 'Built Features Management Plan – Subsidence Impact Register'. Investigate root cause of incident and determine appropriate future control measures.</p> <p>WCC WCC will review and endorse the root cause and future control measure determined by Metropolitan Coal. Metropolitan Coal will be responsible for implementation of endorsed control measure.</p>	
							Level 1		
	Level 2	Moderate cracking (i.e. cracking that requires implementation of management measures).	Implement management measures as outlined in the Longwalls 308-310 LMP.						
	Level 3	Greater than moderate cracking.	Implement contingency measures as outlined in the Longwalls 308-310 LMP.						
	The serviceability of the access roads and tracks are maintained.	Access roads and tracks in the vicinity of the WCC assets.	Cracking about access road/tracks.	After LW 308	Visual observations of access roads/tracks will also be conducted by Metropolitan Coal within 600 m of Longwalls 308-310 extraction as described in the Metropolitan Coal Land Management Plan.				

11 FUTURE EXTRACTION PLANS

In accordance with Condition 7, Schedule 3 of the Project Approval, Metropolitan Coal will collect baseline data for the next Extraction Plan (i.e. Longwalls 308 on). The collection of baseline data will be consistent with the baseline data collected for Longwalls 301-307. However, for the Princes Highway, the baseline (and post-mining) data collected for Longwalls 305-307 will be used as baseline for Longwalls 308 onward.

In addition to the baseline data collection, consideration of the environmental performance and management measures in accordance with the review(s) conducted as part of this BFMP-WCC will inform the appropriate type and frequency of monitoring of the assets relevant to the next Extraction Plan.

12 ANNUAL REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE

In accordance with Condition 3, Schedule 7 of the Project Approval, Metropolitan Coal will conduct an Annual Review of the environmental performance of the Project by the end of March each year.

The Annual Review will:

- describe the works carried out in the past year, and the works proposed to be carried out over the next year;
- include a comprehensive review of the monitoring results and complaints records of the Project over the past year, including a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - monitoring results of previous years; and
 - relevant predictions in the EA, Preferred Project Report and Extraction Plan;
- identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the Project;
- identify any discrepancies between the predicted and actual impacts of the Project, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next year to improve the environmental performance of the Project.

As described in Section 2, the BFMP-WCC will be reviewed within three months of the submission of an Annual Review, and revised where appropriate.

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13 INCIDENTS

An incident is defined as a set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in the Project Approval.

The reporting of incidents will be conducted in accordance with Condition 6, Schedule 7 of the Project Approval. Metropolitan Coal will notify the Secretary of DPIE and any other relevant agencies of any incident associated with the Project as soon as practicable after Metropolitan Coal becomes aware of the incident. Within seven days of the date of the incident, Metropolitan Coal will provide the Secretary of DPIE and any relevant agencies with a detailed report on the incident.

Wollongong City Council will be notified within 24 hours of any access limitations or restrictions.

14 COMPLAINTS

A protocol for the managing and reporting of complaints has been developed as a component of Metropolitan Coal's Environmental Management Strategy and is described below.

The Environment & Community Superintendent is responsible for maintaining a system for recording complaints.

Metropolitan Coal will maintain public signage advertising the telephone number on which environmental complaints can be made. The Environment & Community Superintendent is responsible for ensuring that the currency and effectiveness of the service is maintained. Notifications of complaints received are to be provided as quickly as practicable to the Environment & Community Superintendent.

Complaints and enquiries do not have to be received via the telephone line and may be received in any other form. Any complaint or enquiry relating to environmental management or performance is to be relayed to the Environment & Community Superintendent as soon as practicable. All employees are responsible for ensuring the prompt relaying of complaints. All complaints will be recorded in a complaints register.

For each complaint, the following information will be recorded in the complaints register:

- date and time of complaint;
- method by which the complaint was made;
- personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- nature of the complaint;
- the action(s) taken by Metropolitan Coal in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by Metropolitan Coal, the reason why no action was taken.

The Environment & Community Superintendent is responsible for ensuring that all complaints are appropriately investigated, actioned and that information is fed back to the complainant, unless requested to the contrary.

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In accordance with Condition 10, Schedule 7 of the Project Approval, the complaints register will be made publicly available on the website and updated on a monthly basis. A summary of complaints received, and actions taken will be presented to the Community Consultative Committee as part of the operational performance review.

15 NON-COMPLIANCE WITH STATUTORY REQUIREMENTS

A protocol for the managing and reporting of non-compliances with statutory requirements has been developed as a component of Metropolitan Coal's Environmental Management Strategy and is described below.

Compliance with all approvals, plans and procedures will be the responsibility of all personnel (staff and contractors) employed on or in association with Metropolitan Coal, and will be developed through promotion of Metropolitan Coal ownership under the direction of the General Manager.

The Technical Services Manager and/or Environment & Community Superintendent will undertake regular inspections, internal audits and initiate directions identifying any remediation/rectification work required, and areas of actual or potential non-compliance.

As described in Section 13, Metropolitan Coal will notify the Secretary of the DPIE and any other relevant agencies of any incident associated with Metropolitan Coal as soon as practicable after Metropolitan Coal becomes aware of the incident. Within seven days of the date of the incident, Metropolitan Coal will provide the Secretary of the DPIE and any relevant agencies with a detailed report on the incident.

A review of Metropolitan Coal's compliance with all conditions of the Project Approval, mining leases and all other approvals and licenses will be undertaken prior to (and included within) each Annual Review. The Annual Review will be made publicly available on the Peabody website.

Additionally, in accordance with Condition 8, Schedule 7 of the Project Approval, an independent environmental audit was undertaken by the end of December 2011, and is undertaken a minimum of once every three years thereafter. A copy of the audit report will be submitted to the Secretary of the DPIE and made publicly available on the Peabody website. The independent audit will be undertaken by an appropriately qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary of the DPIE.

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16 REFERENCES

Department of Planning & Environment and Division of Resources and Energy (2015) *Guidelines for the Preparation of Extraction Plans*. Draft.

Helensburgh Coal Pty Ltd [HCPL] (2008) *Metropolitan Coal Project Environmental Assessment*.

Helensburgh Coal Pty Ltd [HCPL] (2009) *Metropolitan Coal Project Preferred Project Report*.

Mine Subsidence Engineering Consultants (2008) *Subsidence Assessment Report on the Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Natural Features and Surface Infrastructure Resulting from the Proposed Extraction of Longwalls 20 to 44 at Metropolitan Colliery in Support of a Part 3A Application*.

Mine Subsidence Engineering Consultants (2021) *Metropolitan Colliery – Proposed Longwalls 308 to 310 - Subsidence Predictions and Impact Assessments for the Wollongong City Council Infrastructure*.

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APPENDIX 1

MSEC (2021) METROPOLITAN COLLIERY – PROPOSED LONGWALLS 308 TO 310 –
SUBSIDENCE PREDICTIONS AND IMPACT ASSESSMENTS FOR THE WOLLONGONG
CITY COUNCIL INFRASTRUCTURE

Metropolitan Coal – LW308-310 Built Features Management Plan – Wollongong City Council		
Revision No. BFMP_WCC-R01-A		
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8th December 2021

Jon Degotardi
Peabody Energy Australia
Metropolitan Colliery
PO Box 402
Helensburgh NSW 2508

Ref: MSEC1200-02

Dear Jon,

RE: Metropolitan Colliery – Proposed Longwalls 308 to 310 - Subsidence Predictions and Impact Assessments for Wollongong City Council Infrastructure

This letter report summarises the predicted subsidence movements and the assessed subsidence impacts for the Wollongong City Council (WCC) infrastructure resulting from the extraction of the proposed Longwalls 308 to 310 at Metropolitan Colliery.

The locations of the WCC infrastructure and the proposed Longwalls 308 to 310 are shown in the attached Drawing No. MSEC1200-10. A Study Area is shown in Drawing No. MSEC1200-10 and is based on the outer limits of a 35° angle of draw line from Longwalls 308 to 310 and the predicted 20mm subsidence contour for Longwalls 308 to 310. The Old Princes Highway (the highway) is located outside the Study Area and is 630 m from Longwall 308 at its nearest point. The highway crosses directly above previous Longwalls 301 to 304. This section of the highway comprises single and dual carriageway with a flexible asphalt pavement and grass verges. A photograph of the Old Princes Highway is provided in Figure 1.



Figure 1 Old Princes Highway

A bridge is located above the Princes Highway at the crossing with the M1 Princes Motorway, at approximately 1.6 km from Longwall 308. The bridge is maintained by Transport for NSW (TfNSW) and therefore the assessments and management for the bridge are outlined in reports for the TfNSW infrastructure.

At a distance of 630 m or more from Longwall 308 to 310, the highway is located outside the Study Area and is not expected to experience measurable conventional vertical subsidence, tilts, curvatures or strains (i.e. no greater than survey accuracy). The highway could however experience far-field horizontal movements. The far-field horizontal movements are expected to be similar to those observed for previous longwall mining in the Southern Coalfield.

The observed incremental far-field horizontal movements, resulting from the extraction of longwalls in the Southern Coalfield, are provided in Figure 2. Monitoring data from Metropolitan Colliery during the extraction of Longwalls 301 to 306 is included in Figure 2. The data includes monitoring by conventional terrestrial survey methods in blue and monitoring by continuous GNSS monitoring stations in black.

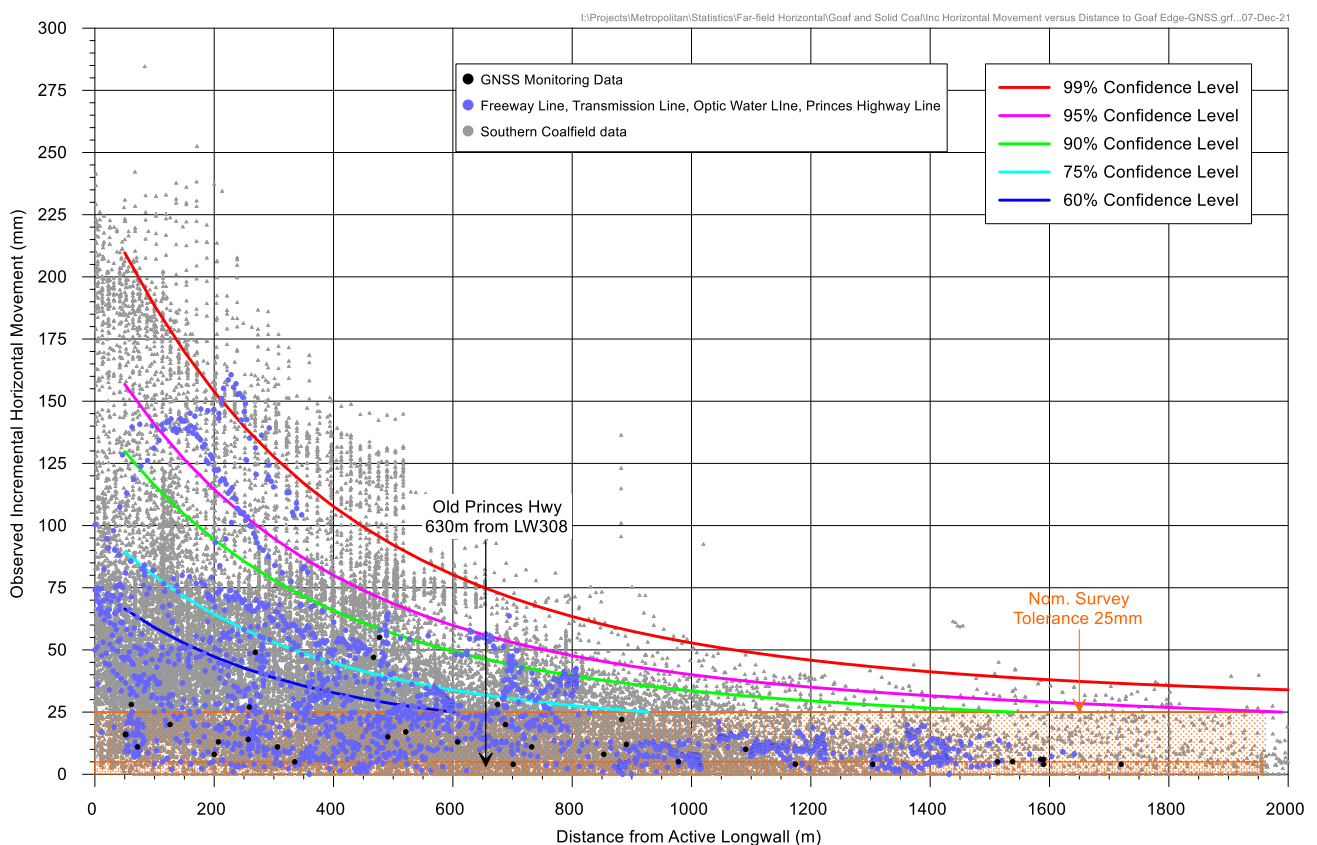


Figure 2 Observed Incremental Far-field Horizontal Movements from the Southern Coalfield (Solid Coal)

The maximum absolute horizontal movements measured at distances greater than 630 m from mining are in the order of 60 mm based on the 95 % confidence level. Far-field horizontal movements tend to be bodily movements orientated towards the mining area. The strains associated with these low level horizontal movements are not expected to be measurable. The maximum observed horizontal movement at 630 m based on the GNSS monitoring data at Metropolitan Colliery is 30 mm.

Whilst the highway could experience low level far-field horizontal movements, the associated tilts, curvatures or strains are not expected to be measurable.

Non-conventional movements can develop due to the presence of geological structures or valley related effects. In some cases, non-conventional movements can develop with no known cause and these are often referred to as 'anomalous' movements.

The locations of the known geological structures at seam level and the major streams are shown in Drawing No. MSEC1200-10. There are no mapped faults located within the Study Area that extend beneath the Old Princes Highway near the longwall layouts. It is possible that the Old Princes Highway could experience localised and

elevated strains due to unknown geological structures (i.e. anomalies) however anomalous movements have not been identified during the extraction of Longwalls 301 to 306, therefore it is considered unlikely that anomalous movements would occur during the extraction of Longwalls 308 to 310.

The Old Princes Highway does not cross any major streams within the Study Area. The highway, therefore, is not expected to experience any measurable valley closure effects.

Approximately 1.7 km of the highway has been mined beneath by Longwalls 301 to 304. Minor tensile cracking impact to the pavement has been observed, predominantly adjacent to the commencing end of Longwall 305. An elevated tensile strain was observed at this location during the extraction of Longwalls 305 and 306. The location of the tensile cracking has a history of deterioration prior to longwall mining. Remediation of the tensile cracks have been undertaken.

It is recommended that monitoring and management strategies developed for the extraction of Longwalls 305 to 307 are updated and continued, in consultation with Wollongong City Council, to manage potential impacts on the Old Princes Highway. It is expected that the highway can be maintained in safe and serviceable conditions with the implementation of the appropriate monitoring and management strategies.

Summary

The Old Princes Highway is 630 m or more from Longwalls 308 to 310. Impacts to the highway are considered unlikely to occur at this distance. It is expected that the highway can be maintained in safe and serviceable conditions with the implementation of the appropriate monitoring and management strategies.

Yours sincerely



Peter DeBono

Attachments:

Drawing No. MSEC1200-10 – Longwalls 308 to 310 – WCC Infrastructure



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METROPOLITAN COAL
 METROPOLITAN COLLIERY
 LONGWALLS 308 TO 310
 WOLLONGONG CITY COUNCIL

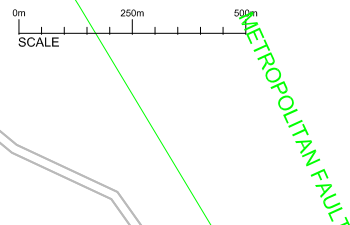
DATE: 7 Sep 2021	SCALE: as shown	DRAWING No: MSEC1200-10	Rev No 01
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LEGEND

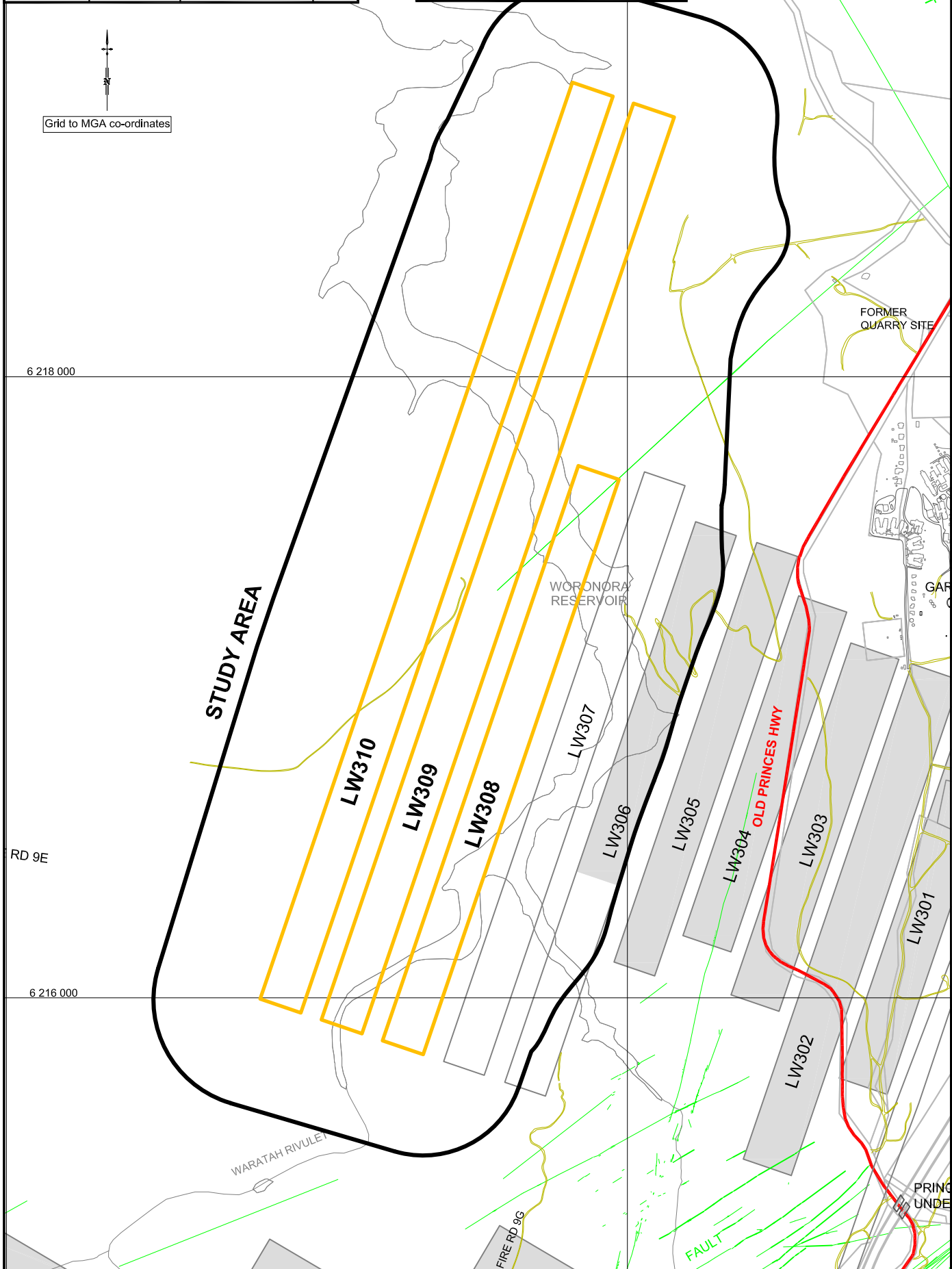
- COUNCIL ASSETS
- UNSEALED ROADS & TRACKS

GEOLOGICAL STRUCTURES

- FAULTS
- DYKES



Grid to MGA co-ordinates



APPENDIX 2
TRAFFIC CONTROL PLANS

Metropolitan Coal – LW308-310 Built Features Management Plan – Wollongong City Council		
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www.invarion.com



Email: info@traffic-logistics.com.au
 Web: www.traffic-logistics.com.au
 Wollongong - 1300 001 599
 Sydney - 02 4648 2200
 Newcastle - 02 4050 0336

Advanced Warning on approach to Garrawarra Plan

MetroPolitian Coal

Screen 1: Old Princes HWY Closed

Screen 2: Access to Garrawarra Only

Client: **Metropolitan Coal**

Location: **Princes Highway Waterfall**

Top No: **TLTCP-AS-78871** REV: **A**

Scope Of Works: **Road Closure**

Top(s) Used as a Guide: **54, 57, 101**


Top Designed Date: **09/10/2019**

Top Expire Date: **09/10/2021**

Designed by: **M Hayward**

Cert. No: **0046246153**

Signature: _____



TCP IS NOT TO SCALE

Approximate speed of traffic at beginning of taper	Traffic control at beginning of taper	Lateral shift taper	Merge taper
45 or less	15	0	15
46 - 55	15	15	30
56 - 65	30	30	60
66 - 75	N/A	70	115
76 - 85	N/A	80	130
86 - 95	N/A	90	145
96 - 105	N/A	100	160
Greater than 105	N/A	110	180

D = THE SPEED OF TRAFFIC MEASURED IN KM/H
 80KM = 80M
 EG: 70KM = 70M
 60KM = 60M
 50KM = 50M

This TCP design is based on TCAWS Manual 2018 - Version 5.0 and AS 1742.3

Traffic Logistics do not accept responsibility of this traffic control plan if it is not implemented by Traffic Logistics

This TCP is to be setup and packed up by qualified traffic controllers with minimum current Implement Traffic Control Plans (Yellow Card). Any modifications to this TCP is to be made by suitably qualified personnel. All modifications to be signed off on this TCP along with certification number

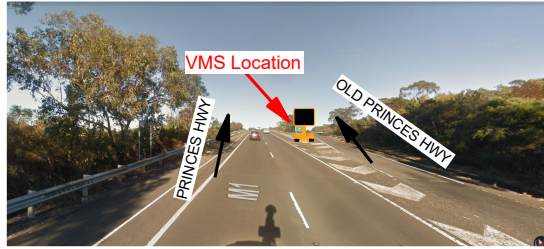
Implemented By

Name - _____

Cert No - _____

Date - _____

Signed - _____

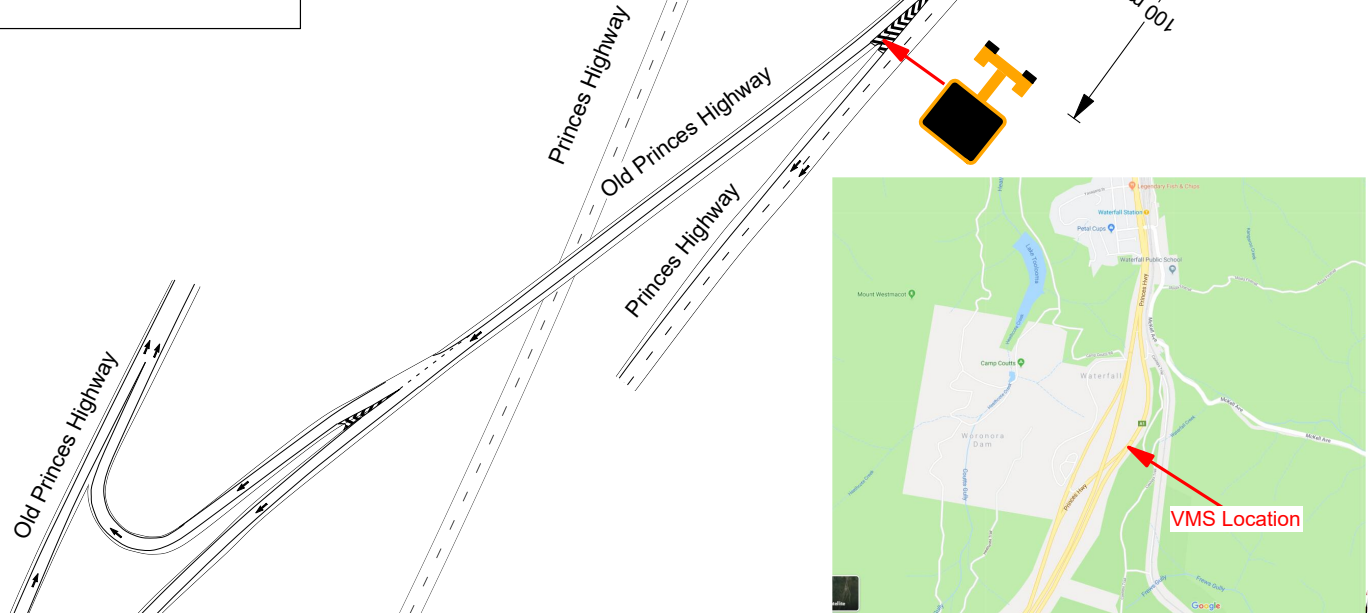


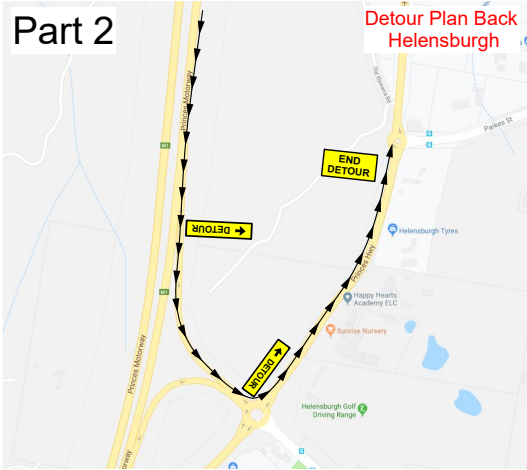
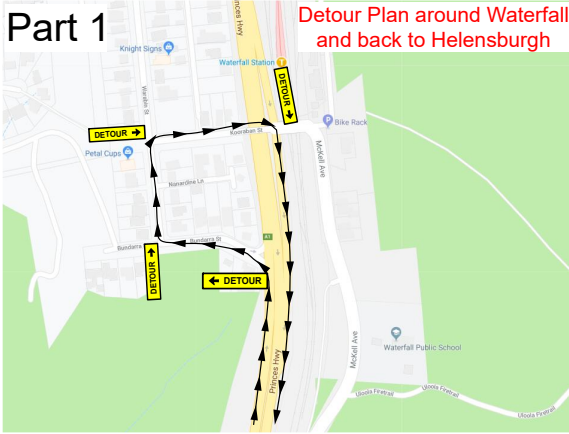
Legend



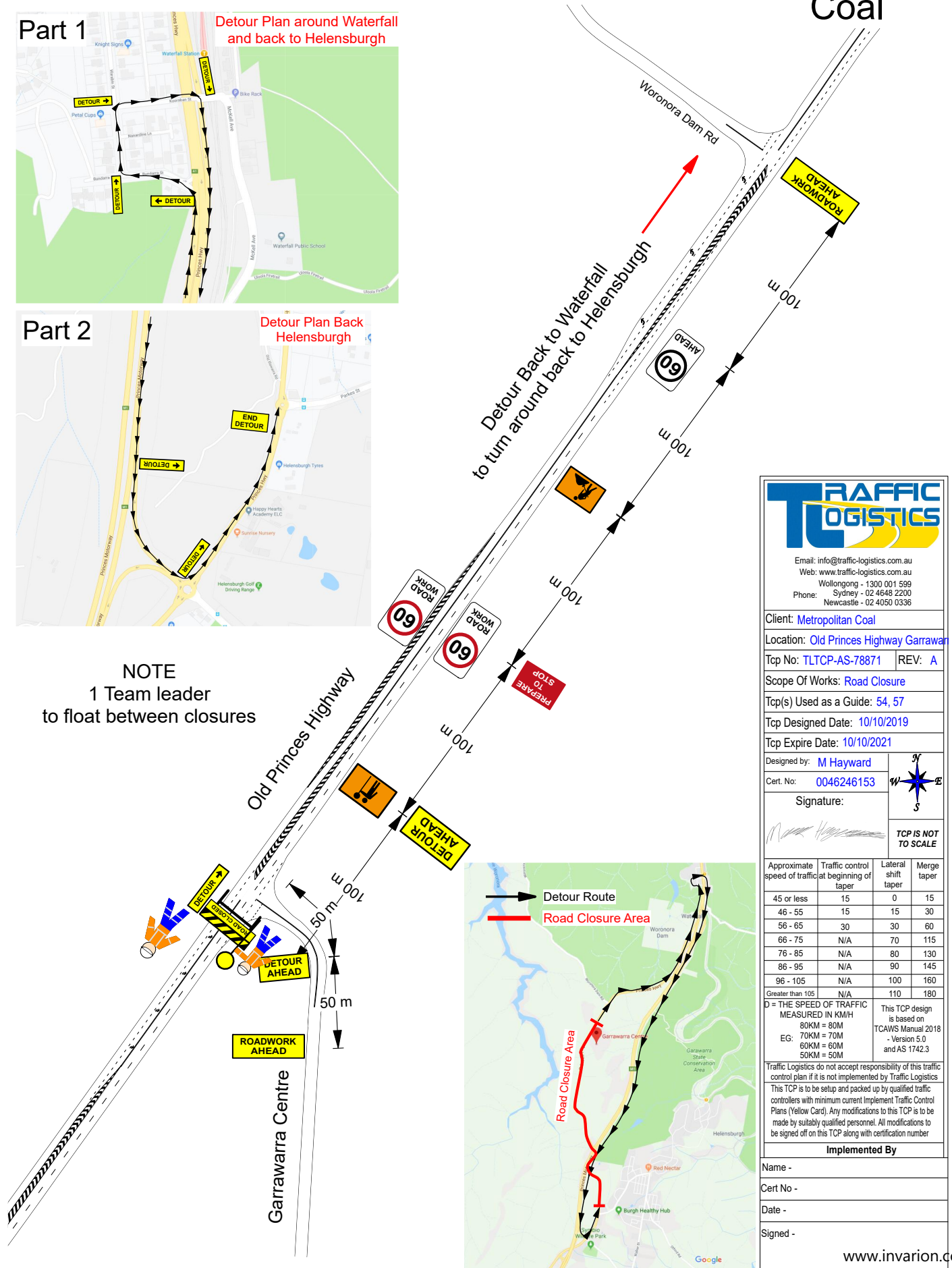
VMS Board


- 1) Traffic Control Plan for road closure and detour.
- 2) Traffic Controllers to manage traffic and pedestrians safely around work area
- 3) Traffic Controllers to only control one lane of traffic at any time IE: one Traffic Controller required for each live lane of traffic
- 4) Traffic Controllers to be relieved every 2hrs when on stop/slow (or suitable change of duties as per TCAWS)
- 5) Traffic Controllers to ensure they have an escape route at all times and wear appropriate PPE
- 6) Minimum lane width of 3.0 m to be maintained at all times
- 7) Cone spacing's to comply with TCAWS table 5.1, taper lengths to comply with TCAWS table 5.2
- 8) Minimum width of 1.2 m shall be maintained at all times for pedestrians to pass unhindered
- 9) Pedestrians shall not be directed onto roadway unless traffic controllers are used to control site and proper measures are put in place to conform with AS 1742.3





NOTE
1 Team leader
to float between closures





Email: info@traffic-logistics.com.au
 Web: www.traffic-logistics.com.au
 Wollongong - 1300 001 599
 Phone: Sydney - 02 4648 2200
 Newcastle - 02 4050 0336

Client: Metropolitan Coal
 Location: Old Princes Highway Garrawarra
 Tcp No: TLTCP-AS-78871 REV: A
 Scope Of Works: Road Closure
 Tcp(s) Used as a Guide: 54, 57
 Tcp Designed Date: 10/10/2019
 Tcp Expire Date: 10/10/2021
 Designed by: M Hayward
 Cert. No: 0046246153
 Signature: _____
 TCP IS NOT TO SCALE

Approximate speed of traffic at beginning of taper	Traffic control at beginning of taper	Lateral shift taper	Merge taper
45 or less	15	0	15
46 - 55	15	15	30
56 - 65	30	30	60
66 - 75	N/A	70	115
76 - 85	N/A	80	130
86 - 95	N/A	90	145
96 - 105	N/A	100	160
Greater than 105	N/A	110	180

D = THE SPEED OF TRAFFIC MEASURED IN KM/H
 EG: 70KM = 70M
 60KM = 60M
 50KM = 50M

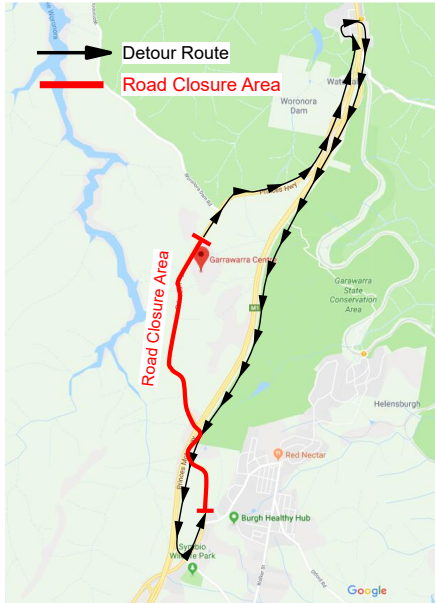
This TCP design is based on TCAVIS Manual 2018 - Version 5.0 and AS 1742.3

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Implemented By

Name - _____
 Cert No - _____
 Date - _____
 Signed - _____



Old Princes Highway Helensburgh South Closure TCP



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 Email: info@traffic-logistics.com.au
 Web: www.traffic-logistics.com.au
 Wollongong - 1300 001 599
 Sydney - 02 4648 2200
 Newcastle - 02 4050 0336

Client: **Metropolitan Coal**
 Location: **Old Princes highway Helensburgh**
 Top No: **TLTCP-AS-78871** REV: **A**
 Scope Of Works: **Road Closure**
 Top(s) Used as a Guide: **54, 57, 101**
 Top Designed Date: **09/10/2019**
 Top Expire Date: **09/10/2021**

Designed by: **M Hayward**
 Cert. No: **0046246153**
 Signature: _____



TCP IS NOT TO SCALE

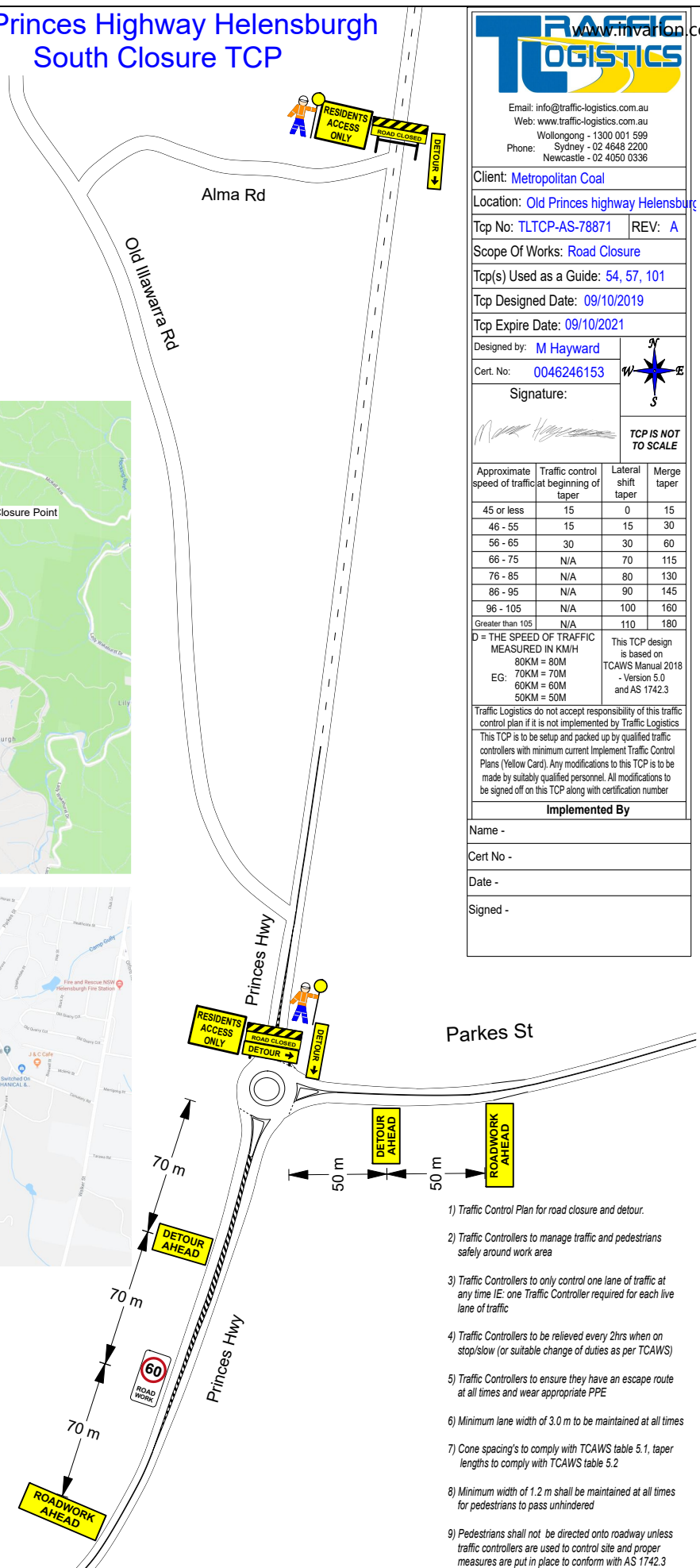
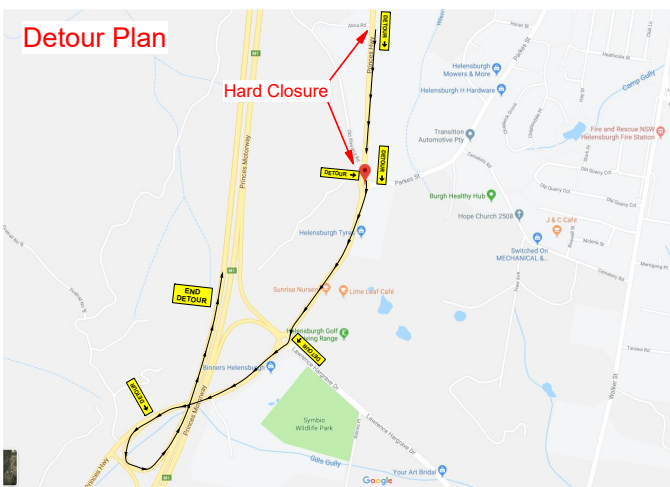
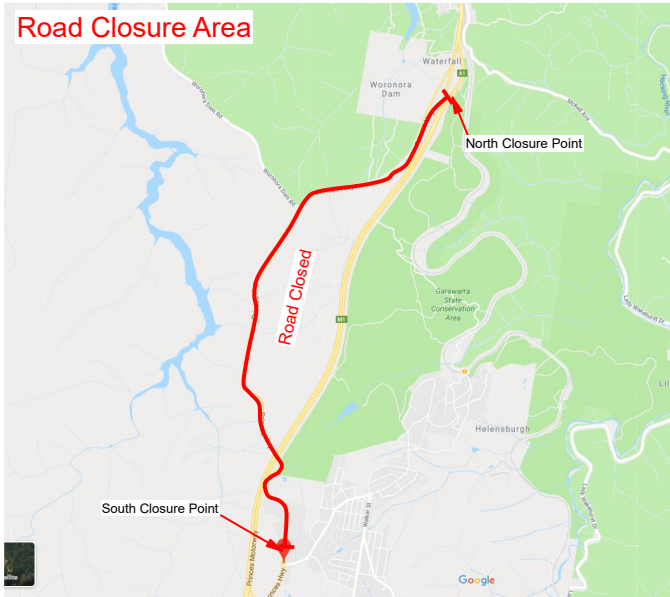
Approximate speed of traffic at beginning of taper	Traffic control at beginning of taper	Lateral shift taper	Merge taper
45 or less	15	0	15
46 - 55	15	15	30
56 - 65	30	30	60
66 - 75	N/A	70	115
76 - 85	N/A	80	130
86 - 95	N/A	90	145
96 - 105	N/A	100	160
Greater than 105	N/A	110	180

D = THE SPEED OF TRAFFIC MEASURED IN KM/H
 80KM = 80M
 70KM = 70M
 60KM = 60M
 50KM = 50M

Traffic Logistics do not accept responsibility of this traffic control plan if it is not implemented by Traffic Logistics
 This TCP is to be setup and packed up by qualified traffic controllers with minimum current Implement Traffic Control Plans (Yellow Card). Any modifications to this TCP is to be made by suitably qualified personnel. All modifications to be signed off on this TCP along with certification number

Implemented By

Name -
 Cert No -
 Date -
 Signed -



- 1) Traffic Control Plan for road closure and detour.
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- 9) Pedestrians shall not be directed onto roadway unless traffic controllers are used to control site and proper measures are put in place to conform with AS 1742.3

APPENDIX 3

BUILT FEATURES MANAGEMENT PLAN – SUBSIDENCE IMPACT REGISTER

Metropolitan Coal – LW308-310 Built Features Management Plan – Wollongong City Council		
Revision No. BFMP_WCC-R01-A		
Document ID: Built Features Management Plan - WCC		

**Built Feature Management Plan – Subsidence Impact Register
Assessment Form**

Date:

Observer (Name and position):

Register Number (i.e. Number 1, 2, etc.):

Longwall Number and Chainage:

Location of Observed Impact:
(Examples: location of culvert, include GPS co-ordinates and a sketch)

Description of Observed Impact:
(Examples: nature and extent of impact - cracks in road etc any relevant information, attach photographs)

Person Notified: Manager - Technical Services

Description of Photographs:

Actions Required:	Contingency Plan Initiated	<input type="checkbox"/>	
	Incident Notification	<input type="checkbox"/>	
	Safety		Measures/Public
	Management Plan Requirements	<input type="checkbox"/>	Safety

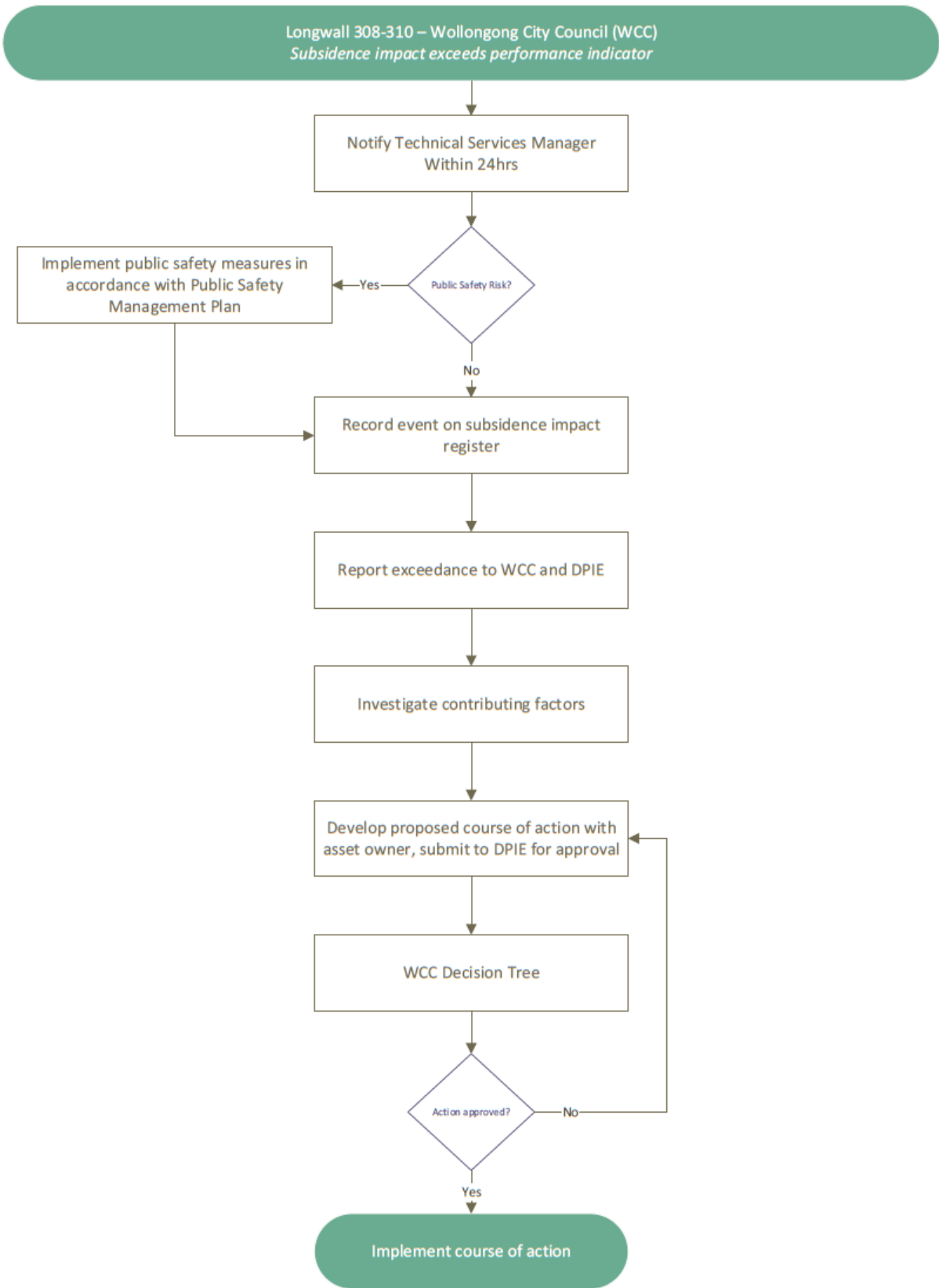
Management or Contingency Measures Implemented:

Effectiveness of Management or Contingency Measures:

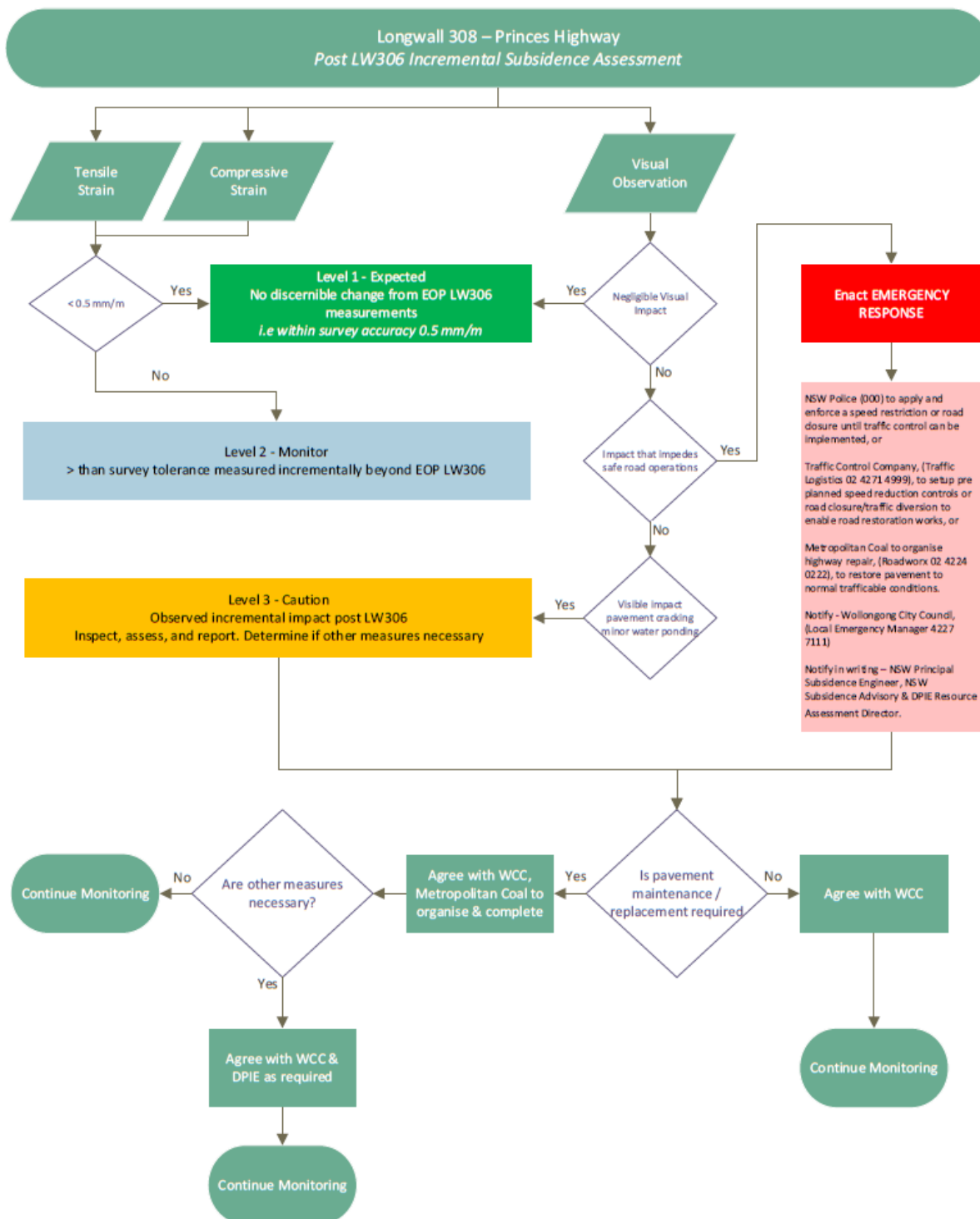
APPENDIX 4

CONTINGENCY PLAN PROCEDURE AND DECISION TREE

Metropolitan Coal – LW308-310 Built Features Management Plan – Wollongong City Council		
Revision No. BFMP_WCC-R01-A		
Document ID: Built Features Management Plan - WCC		



Metropolitan Coal – LW308-310 Built Features Management Plan – Wollongong City Council		
Revision No. BFMP_WCC-R01-A		
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