BULLI SEAM OPERATIONS

APPENDIX R
MAJOR CLIFF LINE RISK ASSESSMENT

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APPENDIX R

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MAJOR CLIFF LINE RISK ASSESSMENT

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R1 INTRODUCTION

The Bulli Seam Operations (the Project) is located approximately 25 kilometres (km) north-west of Wollongong in New South Wales (NSW). The Project involves the continuation of underground mining operations at the Appin Mine and West Cliff Colliery with development to extend to the north (Appin Area 7 and West Cliff Area 5), east (North Cliff), west (Appin West [Area 9] and Appin Area 8) and south (Appin Areas 2 and 3 Extended). A description of the Project is provided in Section 2 in the Main Report of the Environmental Assessment (EA).

As part of the Director-General's Environmental Assessment Requirements (EARs), the EA must include an assessment of potential impacts of the Project taking into consideration the findings and recommendations of the Southern Coalfield Inquiry (SCI). The findings of the SCI are documented in the report *Impacts of Underground Coal Mining on Natural Features in the Southern Coalfield - Strategic Review* (herein described as the Southern Coalfield Panel Report [SCPR]) (NSW Department of Planning [DoP], 2008).

In June 2009, the Minister for Planning released the NSW Planning Assessment Commission (PAC)'s *Metropolitan Coal Project Review Report* (May, 2009) (herein referred to as the Metropolitan PAC Report). The Metropolitan Coal Project was the first mining proposal in the Southern Coalfield to be assessed under Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) since the SCPR was published in 2008.

Of relevance to this Project, the Metropolitan PAC Report concludes (page 132):

> *The Panel considers that it would be desirable if future proposals for mining in the Southern Coalfield were required to take account of the SCI recommendations as modified by this report in preparing the Project Application and the subsequent EA.*

Specifically, Recommendations 2 and 3 of the Metropolitan PAC Report state:

> ***Recommendation 2***
>
> *The Panel recommends that the concept of RMZs enunciated in the SCI report be incorporated into a broader risk framework that includes:*
>
> - *Identifying natural features likely to be at risk of negative environmental consequences from subsidence impacts.*
> - *Assessing the potential risk to those features from the mining proposal.*
> - *Identifying the options for dealing with any significant risk.*
> - *Determining which of these options will form part of the management plan.*
> - *Monitoring the subsidence impacts, consequences for the feature, and outcomes from the management strategies.*
> - *Contingency options and planning to deal with exceedances, and*
> - *Auditing of the risk management process.*
>
> ***Recommendation 3***
>
> *The Panel recommends that the steps set out in Section 6.2 of this review for assessing risk be considered for inclusion in future requirements for the assessment of proposals for mining in the Southern Coalfield to ensure that appropriate information on risks to significant natural features is available in the EA.*

This Major Cliff Line Risk Assessment has been prepared by Illawarra Coal Holdings Pty Ltd (ICHPL), with information and data provided by Mine Subsidence Engineering Consultants (MSEC), Gilbert & Associates, FloraSearch and Biosis Research, to address the requirements of the PAC recommendations for inclusion in the EA.

R2 FRAMEWORK AND ASSESSMENT APPROACH

The framework and assessment approach to major cliff lines has been conducted consistent with the steps described in Section 6.2 of the Metropolitan PAC report (quoted below).

> *The following steps are suggested as a means of ensuring that adequate relevant information is available to the decision maker. They should also assist the Proponent and the regulators to focus their attention early on key issues for preparation of proposals and the identification of problems.*
>
> *Step 1. Identify the mine characteristics and types of subsidence impacts likely to be experienced in the Project Area. Mine characteristics include depth, geology, mining method, mining height, mine layout and percentage extraction.*

Step 2. *Identify significant natural features that might be at risk from the subsidence impacts that could be expected from the proposal. In the case of the Southern Coalfield, a checklist of features that require consideration could be developed based on the SCI Report. It should include at least rivers and significant streams, upland swamps, endangered ecological communities, threatened species habitat, major cliff lines and Aboriginal Heritage. A full description of these features is required, including any characteristics that may be relevant in assessing potential subsidence-related impacts and consequences for the feature or parts of the feature.*

Step 3. *Assess any features identified in Step 2 that warrant special significance status[27] in any proposed risk management plan.*

Step 4. *Using the criteria set out in the SCI Report for deriving RMZ boundaries, draw a Risk Management Zone around those features from Step 2 and Step 3 and assess the risk to the feature (or relevant part of the feature)[28] and*

Step 5. *Proposed risk management plans will be required:*

- *For those features of special significance identified in Step 3 where a risk of impact is a real possibility.[29]*
- *For those features identified in Step 2 where a risk of significant impact is a real possibility.[30]*

Risk management plans should identify:

(i) *the options for managing the risk based on one or a combination of avoidance, mitigation, remediation or tolerance and taking account of any assessment of special significance of the feature;*

(ii) *where relevant, the potential costs of those options;*

(iii) *a preferred option;*

(iv) *where relevant, a monitoring regime that will detect impact, measure actual impact against predicted impact and measure the effectiveness of the management strategies adopted;*

(v) *contingency plans for dealing with the situation where actual impact exceeds predicted impact; and*

(vi) *auditing of the implementation and effectiveness of the risk management plan.*

[27] *'Special Significance Status' is based on an assessment of a natural feature that determines the feature to be so special that it warrants a level of consideration (and possibly protection) well beyond that accorded to others of its kind. It may be based on a rigorous assessment of scientific importance, archaeological and cultural importance, uniqueness, meeting a statutory threshold or some other identifiable value or combination of values.*

[28] *The Panel notes that it would be desirable to develop a two-stage risk assessment process for Step 4 to ensure that those features from steps 2 and 3 that are unlikely to meet the risk and impact thresholds in Step 5 are not required to undergo a stage 2 detailed risk assessment.*

[29] *'Real Possibility' in this context means that the risk of occurrence needs to be more than remote, but no so high as to require a finding of 'more likely than not'. A risk of occurrence of between 5 and 15 percent is probably an appropriate starting point for consideration.*

[30] *A lower level of acceptable impact will apply to features of special significance and the threshold for requiring preparation of a risk management plan will therefore also be lower.*

R3 STEP 1 - MINE PARAMETERS AND LIKELY TYPES OF SUBSIDENCE IMPACTS

The Project mine parameters (depth/mining height, geology, mining method, mine layout and percentage extraction) and likely types of subsidence impacts are described below. Further detail is provided in Section 2 in the Main Report of the EA and the Subsidence Assessment (MSEC, 2009 [Appendix A of the EA]).

R3.1 MINE PARAMETERS

Depth/Mining Height

In the Project extent of longwall mining area, the Bulli Seam is located between approximately 300 metres (m) (in the south-east) and 850 m (in the north-west) below the surface and is the uppermost seam of the Illawarra Coal Measures. The minimum depth of cover between the cliff lines within the Project extent of longwall mining area assessed in this report and the Bulli Seam ranges from approximately:

- 380 m to 490 m in North Cliff;
- 310 m to 460 m in Appin Areas 2 and 3 Extended;
- 460 m to 505 m in Appin Area 7;
- 440 m to 685 m in Appin West (Area 9); and
- 425 m to 475 m in Appin Area 8.

Geology

Above the Bulli Seam, the stratigraphy of the area consists of a sequence of sandstone, shale and claystone units within the Narrabeen Group, which are in turn, overlain by the Hawkesbury Sandstone.

The Wianamatta Group is stratigraphically located above the Hawkesbury Sandstone and has been eroded for a significant portion of the Southern Coalfield. However, within the Project area the Wianamatta Group outcrops generally north-west of the Nepean River and Georges River and ranges in thickness up to greater than 150 m across the Razorback Range.

There are a number of known major structures (e.g. faults or fault systems) in the vicinity of the Project extent of longwall mining area and their locations are provided in Appendix A of the EA.

Mining Method

Longwall mining involves extraction of rectangular panels of coal defined by underground roadways constructed around each longwall panel. The longwall mining machine travels back and forth across the width of the coal face progressively removing coal in slices from the panel. Once each slice of coal is removed from the longwall face, the hydraulic roof supports are moved forward, allowing the roof and a section of the overlying strata to collapse behind the longwall machine (referred to as forming the 'goaf').

Mine Layout

The Project general arrangement is shown on Figure 2-1 in the Main Report of the EA and for the purposes of focussing the environmental assessment herein has been divided into four domains corresponding with the location of each of the underground mining operations, namely:

- West Cliff Area 5 and Appin Area 7 (north domain - contiguous with the current operations);
- North Cliff (east domain);
- Appin West (Area 9) and Appin Area 8 (west domain); and
- Appin Areas 2 and 3 Extended (south domain).

The four domains are shown on Figures 2-8 to 2-11 in the Main Report of the EA. These general arrangements show the proposed future development of the mining operations.[1]

Percentage Extraction

The Bulli Seam varies in thickness from less than 1.5 m to approximately 3.6 m across the Project area (increasing from the south to the north-west) and it is expected that its full thickness would be extracted during the Project underground operations.

R3.2 LIKELY TYPES OF SUBSIDENCE IMPACTS

Subsidence is the vertical and horizontal movement of the land surface as a result of the extraction of underlying coal. Likely types of subsidence impacts (i.e. any physical change to the fabric or structure of the ground, its surface, or man-made features) as a result of systematic (*conventional*) or non-systematic (*non-conventional*) subsidence effects include (MSEC, 2009):

- surface and sub-surface cracking, buckling or dilating, which can directly induce differential movements along cliff lines (the main cause of cliff instabilities), resulting in sliding or toppling type failures; and
- tilting, which can increase the overturning moments in steep or overhanging cliff lines which, if of sufficient magnitude, can result in toppling type failures.

The predicted systematic and non-systematic subsidence effects for major cliff lines and associated risk of impact and environmental consequences are discussed in Step 4 (Section R6). A detailed Subsidence Assessment is presented in Appendix A of the EA.

[1] Subject to detailed design, underground mine development workings (i.e. non-subsiding) may also occur outside of the Project extent of longwall mining area shown on Figures 2-8 to 2-11 in the Main Report of the EA.

R4 STEP 2 – MAJOR CLIFF LINE IDENTIFICATION AND CHARACTERISATION

R4.1 MAJOR CLIFF LINE IDENTIFICATION

The SCPR recommended that environmental assessments for project applications lodged under Part 3A of the EP&A Act identify and assess the significance of all natural features located within 600 m of the edge of secondary extraction (SCPR Recommendation 4). This approach has been taken for major cliff lines. Major cliff lines located above the extent of longwall mining area and within 600 m of the edge of secondary extraction[2] (the study area) are identified in Attachment RA.

A total of 611 major cliff lines have been identified within the study area (Attachment RA). Appendix A of the EA defines a cliff as a continuous rockface having a minimum height of 10 metres and a minimum slope of 2 to 1 (i.e. having a minimum angle to the horizontal of 63 degrees [°]) (MSEC, 2009). This process identifies all cliff lines within this definition regardless of their relative significance. Therefore they are herein referred to as cliff lines. The identification of cliff lines is described further in Appendix A of the EA.

All of the cliff lines have formed from the Hawkesbury Sandstone Sedimentary Group. The locations of cliff lines within the study area are shown in Drawings Nos. MSEC404-210 to MSEC404-214 in Appendix A of the EA. Cliff lines within the study area are associated with the following streams:

- Cataract River, Cascade Creek, Wallandoola Creek, Wallandoola East Creek and Lizard Creek within Appin Area 3 Extended;
- Nepean River, Elladale Creek and Ousedale Creek within Appin Area 7;
- Nepean River, Allens Creek, Clements Creek and Stonequarry Creek within Appin Area 8;
- Nepean River and Harris Creek within Appin West (Area 9); and
- O'Hares Creek, Cobbong Creek and Punchbowl Creek within North Cliff.

Cliff lines have been grouped in Attachment RA accordingly to mining domain (i.e. North Cliff, West Cliff Area 5, Appin Areas 2 and 3 Extended, Appin Area 7, Appin West [Area 9] and Appin Area 8). Each cliff line identified is listed in Attachment RA.

R4.2 CHARACTERISTICS

The key assessment characteristics for each cliff line are presented in Attachment RA.
Sections R4.2.1 to R4.2.13 provide systematic explanations of the content of Attachment RA.

R4.2.1 Domain

The longwall mining domain for each cliff line is identified in Attachment RA and includes:

- NC = North Cliff;
- AA2 = Appin Area 2 Extended;
- AA3 = Appin Area 3 Extended;
- AA7 = Appin Area 7;
- AA8 = Appin Area 8; and
- AA9 = Appin West (Area 9).

R4.2.2 Cliff ID

The cliff line identifier for all 611 cliff lines within the study area is consistent with Appendix A of the EA and is provided in Attachments RA and RB.

R4.2.3 Centroid Easting/Northing

The cliff line centroid[3] eastings and northings are presented in Map Grid of Australia (MGA) co-ordinates and are provided in Attachment RA.

R4.2.4 Cliff Location (relative to Extent of Longwall Mining Area)

Cliff line locations relative to the Project extent of longwall mining area have been identified in Attachment RA and include:

- A = above the extent of longwall mining area;
- O = outside but within study area (i.e. 600 m); and
- N = outside of study area (i.e. >600 m).

[2] For the purpose of this assessment, the edge of secondary extraction has conservatively been taken to be the "extent of longwall mining area" boundary as shown on Figures 2-8 to 2-11 in the Main Report of the EA.

[3] The cliff centroid is the middle of a mapped cliff line in plan view.

R4.2.5 Overall Cliff Length

Cliff line dimensions provided in Attachment RA include the overall length and maximum cliff heights. The distributions of the cliff lengths and maximum heights of cliff lines within the study area are provided in Charts R-1 and R-2.

R4.2.6 Cliff Shape

The shape of each cliff line within the study area has been identified as straight, concave or convex in Appendix A of the EA (and is reproduced in Attachment RA). The distributions of the shapes of cliff lines within the study area are provided in Chart R-3.

R4.2.7 Threatened Species within 50 m

The proximity of each cliff line within the study area to a threatened species identified during Project surveys (i.e. within 50 m of the record) is provided in Attachment RA and includes:

- EP = *Epacris purpurascens*;
- GP = *Grevillea parviflora*;
- LE = *Leucopogon exolasius*;
- PB = *Persoonia bargoensis*;
- PoA = *Pomaderris adnata*;
- LFM = Large-footed Myotis;
- PO = Powerful Owl; and
- RCT = Red Crowned Toadlet.

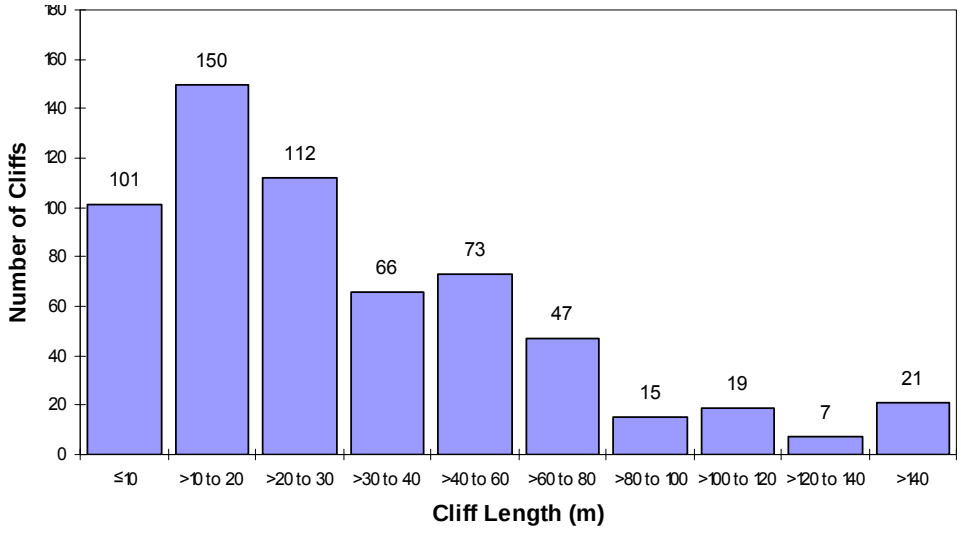


Chart R-1 – Distribution of the Cliff Lengths

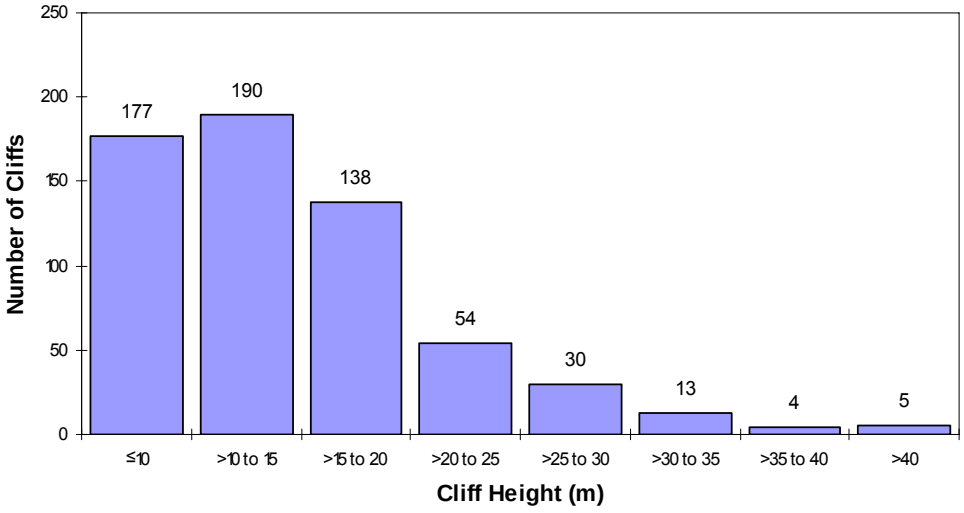


Chart R-2 – Distribution of the Cliff Maximum Heights

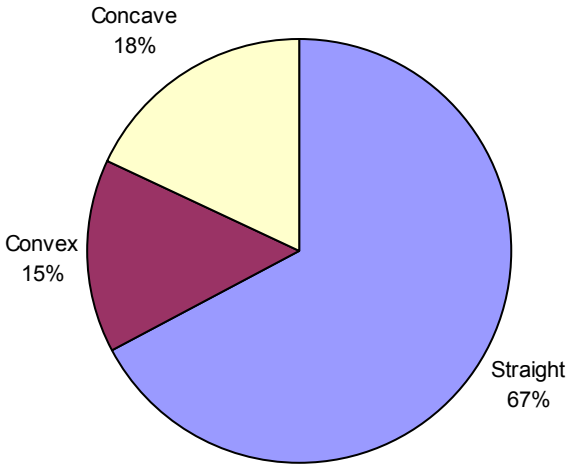


Chart R-3 – Distribution of the Shapes of the Cliffs

R4.2.8 Endangered Ecological Community Present Above or Below Cliff Line

The presence and type of Endangered Ecological Community (EEC) either above or below a cliff line within the study area is indicated in Attachment RA and includes:

- CPW = Cumberland Plain Woodland;
- REF = River-flat Eucalypt Forest on Coastal Floodplains;
- SDR = Western Sydney Dry Rainforest in the Sydney Basin Bioregion;
- SST = Sandstone/Shale Transition Forest; and
- MSW = Moist Shale Woodland in the Sydney Basin Bioregion.

R4.2.9 Relevant DECC Area

Attachment RA identifies those cliff lines within the study area that are located in the Dharawal State Conservation Area (DSCA).

R4.2.10 Significant Watercourse within 500 m

The proximity of each cliff line within the study area to a significant watercourse (i.e. if it is within 500 m of a 3rd order or above/perennial stream) is provided in Attachment RA.

R4.2.11 Land Zoning

The land zoning of cliff lines is based on Local Environmental Plan (LEP) Zoning (i.e. for Wollondilly Shire Council [WSC], Campbelltown City Council [CCC] and Wollongong City Council [WCC]) and is provided in Attachment RA and includes:

- AL = Agricultural Landscape;
- AR = Arterial Road Reservation;
- I = Industrial;
- NU = Non-Urban;
- OS = Open Space, Local Open Space and/or Regional Open Space Reservation;
- R = Rural;
- Res = Residential;
- RL = Rural Living;
- SCA = National Parks, State Conservation Areas and Nature Reserves;
- SEP = Special Environmental Protection;
- SU = Special Use (Other than Water Catchment); and
- WC = Water Catchment.

R4.2.12 Public Access and Visibility

Public access and visibility of cliff lines are restricted within the Metropolitan and Woronora Special Areas and within the parts of the O'Hares Creek Special Area outside of the Dharawal State Conservation Area. All other cliff lines have the potential to be accessed by and visible to the public.

Public access and visibility of each cliff line within the study area is indicated in Attachment RA.

R4.2.13 Known Aboriginal Heritage Site within 50 m

The proximity of each cliff line within the study area to a known Aboriginal heritage site (i.e. within 50 m) is indicated in Attachment RA.

R5 STEP 3 – IDENTIFICATION OF CLIFF LINES OF SPECIAL SIGNIFICANCE

In relation to 'special significance' the Metropolitan PAC Report provides the following (page 42):

> *'Special Significance Status' is based on an assessment of a natural feature that determines the feature to be so special that it warrants a level of consideration (and possibly protection) well beyond that accorded to others of its kind. It may be based on a rigorous assessment of scientific importance, archaeological and cultural importance, uniqueness, meeting a statutory threshold or some other identifiable value or combination of values.*

The Metropolitan PAC Report indicates that in the current circumstances, discussions as to the significance of natural features such as streams, swamps and cliff lines will come down to a case by case assessment of the values attributed to the feature. The Metropolitan PAC Report also recognised that in the absence of quantifiable measures and an objective threshold, conclusions about 'special significance' will be subjective.

Based on the cliff line characteristics described in Attachment RA (such as length, height, shape, its location relative to threatened species records, EECs and Aboriginal heritage sites, and its public accessibility/visibility), no individual cliff lines in the Project area are considered to be sufficiently unique or different so as to require identification of 'special significance' and thus requiring special consideration in a risk assessment framework. Many of the cliffs are of considerable length or height, area associated with large streams (such as the Nepean River, Cataract River, Cascade Creek, Wallandoola Creek, Wallandoola East Creek, Lizard Creek, Elladale Creek, Ousedale Creek, Allens Creek, Clements Creek, Stonequarry Creek, Harris Creek, O'Hares Creek, Cobbong Creek and Punchbowl Creek) and are accessible by the public.

No cliff line of special significance status, when compared to the characteristics of other cliff lines in the study area, has been identified.

R6 STEP 4 – RISK IDENTIFICATION AND ASSESSMENT

Systematic subsidence predictions are provided in Attachment RA individually for each cliff line within the study area and are described in Section R6.3 below.

R6.1 RISK MANAGEMENT ZONES

As shown in Attachments RA and RB, a Risk Management Zone (RMZ) has been applied to each cliff line identified in Step 2 (Section R4).

The RMZ boundary is based on the definition prescribed in the SCPR (i.e. 400 m surface lateral distance from the outside extremity of the site or by a 40° angle from the vertical down to the coal seam which is proposed to be extracted, whichever is greater).

R6.2 DEPTH OF COVER

The minimum depth of cover between each cliff line within the study area and the Bulli Seam is provided in Attachment RA and is summarised in Section R3.1.

R6.3 SYSTEMATIC SUBSIDENCE PREDICTIONS

Systematic subsidence predictions for each cliff line based on the EA Base Plan Longwalls are provided in Attachment RA, including:

- Total maximum subsidence (millimetres [mm]);
- Total maximum tilt (millimetres per metre [mm/m]);
- Total maximum curvatures (1/km); and
- Estimated average tensile and compressive strains for individual cliff lines and mining domains as a whole (based on a relationship of 15 times curvature).

The total maximum subsidence and tilt predictions, and estimated average tensile and compressive strains, are used to inform the potential risk of subsidence impacts and associated environmental consequences on cliff lines in Section R6.4.

Cliff lines could also be subjected to valley related movements resulting from the extraction of the Project longwalls. The predicted profiles of the upsidence and closure movements along the rivers and other streams associated with the cliff lines within the study area (Section R4.1) are provided in Appendix A of the EA.

R6.4 RISK OF IMPACT RESULTING IN ENVIRONMENTAL CONSEQUENCES

Rock falls occur naturally, however subsidence has the potential to further reduce the stability of features such as cliff lines and increase the incidence of rock fall.

The Metropolitan PAC Report indicates:

> *The SCI observed subsidence impacts on cliff lines, principally rock falls associated with river gorges or other cliffs. It concluded that most such rock falls appeared to be minor, in so far as they seem to affect a relatively small proportion of cliffs close to longwall operations.*

The following sub-sections describe the risk assessment undertaken by ICHPL and relevant specialists (particularly MSEC), using the information compiled in Attachment RA.

R6.4.1 Risk Ranking of Environmental Consequence

Cliff Lines located above Solid Coal

The EA Base Plan Longwalls would not mine directly beneath the majority of cliff lines within the study area. This includes cliff lines located along the Nepean River, Harris Creek, Cataract River, O'Hares Creek and Cobbong Creek (some as a consequence of applying the stream risk minimisation criteria described in the Stream Risk Assessment [Appendix P of the EA]).

A summary of the maximum predicted values of systematic subsidence, tilt and strain at cliff lines above solid coal within the study area, at any time during or after the extraction of the EA Base Plan Longwalls, is provided in Table R-1.

Tilt does not directly induce differential movements along cliff lines, which is the main cause of cliff instabilities. Tilt, however, can increase the overturning moments in steep or overhanging cliffs which, if of sufficient magnitude, could result in toppling type failures. The predicted maximum tilts at cliff lines that are located above solid coal within the study area are very small in comparison to the existing slopes of the cliff faces and are unlikely, therefore, to result in topping type failures in these cases. In the majority of cases, it is predicted that mining would tilt cliff lines back into the slope, reducing the overturning moments.

Table R-1
Cliff Lines over Solid Coal - Maximum Predicted Systematic Subsidence

Domain	Maximum Predicted Subsidence (mm)	Maximum Predicted Tilt (mm/m)	Maximum Predicted Hogging Curvature (1/km)	Maximum Predicted Sagging Curvature (1/km)
Area 2	< 20	< 0.2	< 0.01	< 0.01
Area 3	875	2.9	0.05	0.02
Area 7	300	2.7	0.02	< 0.01
Area 8	700	2.1	0.07	0.02
Area 9	50	0.5	< 0.01	< 0.01
North Cliff	700	3.2	0.07	0.02

Source: MSEC (2009).

It is possible, however, that if the ground curvatures or strains are of sufficient magnitude, sections of rock could fracture along existing bedding planes or joints and become unstable, resulting in sliding or toppling type failures along cliff lines. However, the observed ground strains over solid coal are generally relatively low, typically in the order of survey tolerance.

Cliff lines could also be subjected to valley related movements resulting from the extraction of the longwalls. The predicted profiles of the upsidence and closure movements along the rivers and other streams associated with the cliff lines within the study area (Section R4.1) are provided in the Subsidence Assessment (Appendix A of the EA).

The maximum predicted upsidence and compressive strain due to closure movements occur in the bases of the valleys and are unlikely, therefore, to result in impacts on cliff lines, which are located up the valley sides. Closure movements tend to be bodily movements of the valley sides, however, stresses can be induced in the strata where differential closure movements occur around bends in the river valley. It can be seen from Chart R3, however, that approximately 67 percent (%) (411 of 611) of cliff lines within the study area are located along relatively straight sections of the valleys.

It is extremely difficult to assess the likelihood of cliff instabilities at any one location based upon predicted ground movements. The likelihood of a cliff line becoming unstable is dependent on a number of factors which are difficult to fully quantify. These include jointing, inclusions, weaknesses within the rockmass and water pressure and seepage flow behind the rockface. Even if these factors could be determined, it would still be difficult to quantify the extent to which these factors may influence the stability of a cliff naturally or when it is exposed to mine subsidence movements. It is therefore possible that cliff instabilities may occur during mining that may be attributable to either natural causes, mine subsidence or both.

The likelihood of cliff instabilities within the study area can be assessed using case studies where longwall mining has occurred directly beneath or in the vicinities of cliff lines in the past.

Although very minor rock falls have been observed over solid coal outside the extracted goaf areas of longwall mining in the Southern Coalfield, there have been no recorded cliff instabilities outside the extracted goaf areas of longwall mining in the Southern Coalfield. Further discussion of this is presented in Appendix A of the EA.

Based on the case study history of mining at Appin and Tower Collieries, it is possible that isolated rock falls could occur as a result of the extraction of the longwalls. It is not expected, however, that any large cliff instabilities would occur as a result of the extraction of the longwalls (i.e. the risk of cliff instability is extremely low).

ICHPL would develop a management plan to manage potential risks to the general public that may be visiting or passing by cliff lines within the study area. The management plan may include the erection of warning signs during periods of active mining.

R6.4.1.1 Cliff Lines along Douglas Park Drive

Douglas Park Drive is located in Appin West (Area 9) and runs alongside Harris Creek. Cliff lines are located in this area, some overhanging the road, as shown in Plate R-1.

The EA Base Plan Longwalls are located approximately 700 metres from the cliff lines along Douglas Park Drive at their closest point. The likelihood of mining-induced impacts to these cliff lines is considered to be extremely low at this offset distance.

However, given the potential for significant consequences from a rock fall, it is recommended that in consultation with WSC, management measures are developed to ensure that the road remains safe and serviceable throughout the mining period. The management plan would require input from geotechnical and subsidence engineers. The management measures may include:

- site investigation of cliff lines along Douglas Park Drive by a qualified geotechnical engineer;
- detailed monitoring of absolute and differential movements of cliff lines;
- regular review and assessment of the monitoring data;
- development of a traffic management plan; and
- implementation of planned responses if triggered by monitoring and inspections.

Plate R-1: Cliff Lines along Douglas Park Drive

R6.4.1.2 Structures, Access Roads and Tracks on Private Properties

There are a number of structures, access roads and tracks on private properties in the vicinity of cliff lines located above solid coal within the study area (Appendix A of the EA).

Some of the closest structures to cliff lines are located beyond the ends of existing Appin Longwalls 702 and 703. Intensive monitoring was undertaken of these structures and no impacts were observed during the mining of Longwall 702.

However, given the potential for significant consequences from rock falls, it is recommended that in consultation with landowners, management measures are developed to ensure that their properties remain safe and serviceable throughout the mining period. The management plan would require input from structural, geotechnical and subsidence engineers.

The management measures may include:

- site investigation of cliff lines and structures by qualified structural and geotechnical engineers;
- consideration and possible implementation of mitigation measures to reduce the potential for impacts;
- detailed monitoring of absolute and differential movements of the ground and the structures;
- regular review and assessment of the monitoring data; and
- implementation of planned responses if triggered by monitoring and inspections.

Cliff Lines located above Goaf

The EA Base Plan Longwalls would mine directly beneath some cliff lines located along Wallandoola Creek and Cascade Creek and these cliff lines may experience the maximum predicted subsidence movements for Appin Area 3 Extended, which are provided in Appendix A of the EA.

It is extremely difficult to assess the likelihood of cliff instabilities based upon predicted ground movements and it is extremely difficult to assess the likelihood of instability for a particular cliff feature. The likelihood of a cliff becoming unstable is dependent on a number of factors which are difficult to fully quantify. These include jointing, inclusions, weaknesses within the rockmass and water pressure and seepage flow behind the rockface. Even if these factors could be determined, it would still be difficult to quantify the extent to which these factors may influence the stability of a cliff naturally or when it is exposed to mine subsidence movements.

The likelihood of cliff instabilities within the study area can be assessed using case studies where longwall mining has occurred directly beneath or in the vicinity of cliff lines in the past. These case studies are presented in Appendix A of the EA.

Based on the case study history of mining at Tower and Tahmoor Collieries, there is a moderate to likely probability that rock falls and cliff instabilities would occur somewhere along cliff lines which are directly mined beneath, including those along Wallandoola Creek and Cascade Creek.

Any impacts on cliff lines, resulting from the extraction of the longwalls, are expected to represent in the order of 3 to 5% of the total length of cliff lines that are directly mined beneath.

It is extremely difficult to accurately predict which cliff line would experience an impact. It is considered, however, that cliff lines at greater risk of impact are those with large overhangs and cliff lines located along concave sections of the creeks.

There are no structures or roads located near Wallandoola Creek or Cascade Creek. There is no public access to either of these streams or associated cliff lines, both of which are located within the declared Metropolitan Catchment Area. It is recommended that a management plan is developed in consultation with the Sydney Catchment Authority to manage potential risks to the workers that may be visiting or passing by these cliff lines during periods of the active mining directly beneath the area.

R6.4.2 Risk Ranking Summary

The EA Base Plan Longwalls would not mine directly beneath the majority of cliff lines within the study area, including cliff lines located along the Nepean River, Harris Creek, Cataract River, O'Hares Creek and Cobbong Creek. The EA Base Plan Longwalls would mine directly beneath some cliff lines located along Wallandoola Creek and Cascade Creek.

As a result of mining near cliff lines located along the Nepean River, Harris Creek, Cataract River, O'Hares Creek and Cobbong Creek, it is possible that rock falls could occur as a result of the extraction of the longwalls, however the likelihood of rock fall was assessed as low.

Based on the case study history of mining at Tower and Tahmoor Collieries, there is a moderate to likely probability that rock falls and cliff instabilities would occur somewhere along cliff lines which are directly mined beneath, including those along Wallandoola Creek and Cascade Creek.

Any impacts on cliff lines, resulting from the extraction of the longwalls, are expected to represent in the order of 3 to 5% of the total length of cliff lines that are directly mined beneath. It is extremely difficult to accurately predict which cliff line would experience an impact. It is considered, however, that cliff lines at greater risk of impact are those with large overhangs and concave sections of cliff lines along associated streams.

R7 STEP 5 – RISK MANAGEMENT PLANS

Section 6.2 of the Metropolitan PAC Report provides a framework for Risk Management Plans, as follows:

> *Risk management plans should identify:*
>
> *(i) the options for managing the risk based on one or a combination of avoidance, mitigation, remediation or tolerance and taking account of any assessment of special significance of the feature;*
>
> *(ii) where relevant, the potential costs of those options;*
>
> *(iii) a preferred option;*
>
> *(iv) where relevant, a monitoring regime that will detect impact, measure actual impact against predicted impact and measure the effectiveness of the management strategies adopted;*
>
> *(v) contingency plans for dealing with the situation where actual impact exceeds predicted impact; and*
>
> *(vi) auditing of the implementation and effectiveness of the risk management plan.*

Cliff lines not directly mined beneath are not expected to experience cliff instabilities, and the risk of rock fall is expected to be low with the implementation of management measures described in Section R6.4.2 and Appendix A of the EA. Therefore, a Risk Management Plan would be prepared for each cliff line that is proposed to be directly mined beneath as described in Appendix A of the EA.

R8 REFERENCES

Department of Planning (2008) *Impacts of Underground Coal Mining on Natural Features in the Southern Coalfield - Strategic Review*. Southern Coalfield Panel Report.

Mine Subsidence Engineering Consultants (2009) *The Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Natural Features and Surface Infrastructure resulting from the Bulli Seam Operations in support of the Part 3a Application.* Report prepared for BHP Billiton Illawarra Coal.

Planning Assessment Commission (2009) *Metropolitan Coal Project Review Report*.

ATTACHMENT RA

MAJOR CLIFF LINE MATRIX

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA2	A2_0001	299345	6207265	A	55	30	Straight	-	-	-	M	N	WC	N	N	Refer Cliff RMZ Plan 19
AA2	A2_0010	301510	6205930	O	40	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 20
AA2	A2_0020	301185	6205590	O	25	15	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 20
AA3	A3_0001	293400	6210095	O	45	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0002	293385	6210120	O	25	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0003	293410	6210140	O	30	25	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0004	293420	6210165	O	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0005	293400	6210170	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0006	293435	6210195	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0007	293270	6210285	O	15	10	Straight	RCT	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0008	293385	6210320	O	10	10	Straight	RCT	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0009	293370	6210360	O	10	10	Straight	RCT	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0010	293250	6210430	O	145	35	Straight	RCT	SST	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0011	293300	6210500	O	25	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0012	293305	6210515	O	20	15	Straight	-	SST	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0013	293335	6210510	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0014	293465	6210490	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0015	293570	6210445	O	225	35	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0016	293695	6210375	O	55	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0017	293745	6210355	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0018	293760	6210330	O	25	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0019	293785	6210295	O	50	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0020	293695	6210215	O	25	15	Straight	-	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0021	293710	6210190	O	10	10	Straight	-	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0022	293835	6210205	O	90	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0023	293830	6210170	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0024	293875	6210160	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0025	293890	6210140	O	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0026	293910	6210095	O	50	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0027	293920	6210065	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0028	293745	6210140	O	5	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0029	293760	6210120	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0030	293790	6210095	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0031	293795	6210075	O	20	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0032	293790	6210020	O	50	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0033	293800	6210020	O	70	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0034	293785	6209950	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0035	293795	6209960	A,O	70	40	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0036	293815	6209905	A	25	20	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0037	293845	6209895	A	100	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0038	293840	6209855	A	30	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0039	293860	6209835	A	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0040	293870	6209795	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0041	293990	6209765	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0042	294010	6209780	A	5	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0043	294035	6209790	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0044	294075	6209775	A	15	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 26
AA3	A3_0045	294085	6209730	A	80	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 26
AA3	A3_0046	294120	6209810	A	150	30	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 26
AA3	A3_0047	293990	6209945	O	105	35	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0048	294090	6210000	O	130	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0049	294160	6210025	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0050	294165	6209925	O	5	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0051	294190	6209925	O	25	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0052	294285	6209945	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0053	294290	6210045	O	65	25	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0054	294345	6210060	O	45	20	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0055	294375	6209970	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0056	294405	6209970	O	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0057	294410	6210070	O	40	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0058	294450	6210080	O	5	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0059	294500	6209985	O	105	10	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0060	294525	6210010	O	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0061	294495	6210085	O	15	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0062	294505	6210100	O	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0063	294540	6210125	O	20	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0064	294620	6210185	O	60	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0065	294835	6210140	O	75	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0066	294840	6210245	O	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0067	294860	6210255	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0068	294875	6210265	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0069	293800	6209915	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0070	294920	6210165	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0071	294955	6210280	O	85	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0072	295035	6210285	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0073	295060	6210255	O	25	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0074	294990	6210130	O	50	15	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0075	294995	6210095	O	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0076	294995	6210075	O	5	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA3	A3_0077	294985	6210055	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0078	294990	6210020	O	30	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0079	294990	6209990	O	25	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0080	295115	6210105	O	20	15	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0081	293375	6210065	O	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0082	293345	6210045	O	30	20	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0083	293330	6210030	O	30	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0084	293205	6209970	A,O	255	35	Concave	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0085	293185	6209960	A	10	15	Straight	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0086	293085	6209960	A	15	10	Straight	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0087	293055	6209945	A	45	20	Straight	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0088	293010	6209945	A	15	10	Straight	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0089	292995	6209950	A	10	10	Straight	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0090	293230	6210120	O	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0091	293135	6210115	O	50	15	Convex	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0092	293085	6210110	O	20	15	Straight	GP,LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0093	293040	6210105	O	45	20	Straight	GP,LE	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0094	293005	6210100	O	30	15	Straight	GP,LE	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0095	293010	6210080	O	15	10	Straight	GP,LE	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0096	292970	6210085	O	45	15	Straight	GP,LE	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0097	292960	6210105	O	30	15	Convex	GP,LE	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0098	294150	6209670	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 26
AA3	A3_0099	294130	6209630	A	10	10	Straight	-	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 26
AA3	A3_0100	294140	6209620	A	15	15	Straight	-	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 26
AA3	A3_0101	294160	6209605	A	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 26
AA3	A3_0102	294275	6209585	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 26
AA3	A3_0110	295125	6209980	O	10	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0120	294965	6209645	A	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0130	294970	6209620	A	10	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0140	294970	6209595	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0150	294970	6209510	A	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0160	294975	6209480	A	30	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0170	295120	6209535	A	75	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0180	295155	6209410	A	15	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0190	295160	6209380	A	20	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0200	294990	6209370	A	10	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0210	295050	6209120	A	40	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0220	295225	6209155	A	25	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0230	295255	6209085	A	30	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0240	295275	6209075	A	30	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0250	295265	6209055	A	15	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0260	295290	6209040	A	15	15	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0270	295280	6209020	A	40	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0280	295280	6208910	A	15	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0290	295340	6208780	A	130	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0300	295385	6208680	A	95	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0310	295415	6208605	A	60	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0320	295450	6208535	A	30	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0330	295485	6208465	A	95	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0340	295555	6208325	A	40	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0350	295655	6208205	A	25	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 27
AA3	A3_0360	295865	6207685	A	145	35	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 29
AA3	A3_0370	296245	6207570	A	265	40	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0380	296375	6207515	A	10	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0390	296385	6207505	A	15	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0400	296455	6207450	A	35	25	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0410	296480	6207435	A	5	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0420	296540	6207380	A	150	35	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0430	296605	6207300	A	40	20	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0440	296710	6207245	A	235	35	Convex	LE	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0450	296835	6207200	A	190	60	Concave	LE	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 30
AA3	A3_0460	296785	6207115	A	15	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0470	296690	6207055	A	105	25	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0480	296595	6207085	A	65	25	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0490	296545	6207135	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0500	296650	6207135	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0510	296640	6207140	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0520	296570	6207205	A	75	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 30
AA3	A3_0530	295600	6207915	A	60	20	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 28
AA3	A3_0540	295555	6207940	A	55	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 28
AA3	A3_0550	292675	6210060	A,O	405	45	Concave	GP,LE	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 23
AA3	A3_0560	292420	6209950	A	150	35	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0570	292360	6209925	A	25	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0580	292395	6209905	A	15	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA3	A3_0590	292345	6209885	A	15	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0600	292315	6209900	A	35	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0610	292030	6210405	O	60	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 31
AA3	A3_0620	292020	6210440	O	25	25	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 31
AA3	A3_0630	291990	6210435	O	25	35	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 31
AA3	A3_0640	291845	6210470	O	320	65	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 31
AA3	A3_0650	291595	6210400	O	50	30	Convex	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 31
AA3	A3_0660	291770	6210325	O	30	25	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 31
AA3	A3_0670	292045	6210080	A	35	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0680	292040	6210050	A	25	20	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0690	292025	6210030	A	15	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0700	292000	6210025	A	40	20	Convex	-	SST	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0710	292015	6210010	A	20	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0720	292010	6209965	A	35	25	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0730	291985	6209955	A	80	25	Concave	-	SST	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0740	292015	6209915	A	30	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0750	292040	6209845	A	40	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0760	292080	6209800	A	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0770	292115	6209780	A	30	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0780	292065	6209770	A	35	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0790	292130	6209725	A	80	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0800	292200	6209705	A	25	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0810	292240	6209720	A	25	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0820	292320	6209725	A	50	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0830	292450	6209780	A	45	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0840	292620	6209900	A	60	20	Convex	PB	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0850	292780	6209945	A	75	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 23
AA3	A3_0860	292965	6209925	A	55	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0870	292965	6209855	A	45	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0880	292845	6209865	A	25	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0890	292840	6209830	A	40	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0900	292820	6209785	A	55	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0910	292940	6209650	A	170	30	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0920	292830	6209680	A	5	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0930	292845	6209660	A	55	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0940	292860	6209615	A	30	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0950	292880	6209570	A	55	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0960	292930	6209510	A	55	30	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0970	293085	6209440	A	145	45	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0980	293110	6209300	A	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_0990	293155	6209215	A	115	25	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1000	293285	6209170	A	60	20	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1010	293310	6209130	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1020	293335	6209075	A	115	35	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1030	293250	6208925	A	40	15	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1040	293210	6208890	A	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1050	293195	6208880	A	15	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1060	293175	6208880	A	65	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1070	293160	6208860	A	30	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1080	293100	6208830	A	105	30	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1090	293185	6208625	A	105	35	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1100	293100	6208565	A	45	20	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1110	293060	6208550	A	20	15	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1120	292965	6208365	A	50	20	Concave	-	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 25
AA3	A3_1130	292890	6208360	A	45	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1140	292845	6208315	A	75	30	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1150	292900	6208095	A	50	20	Straight	-	-	-	M	Y	WC	N	Y	Refer Cliff RMZ Plan 25
AA3	A3_1160	292915	6208070	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1170	292875	6207985	A	35	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1180	292790	6207995	A	20	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1190	292710	6207975	A	110	35	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1200	292655	6207730	A	70	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1210	292620	6207325	A	65	25	Concave	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 24
AA3	A3_1220	292575	6207730	A	10	15	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1230	292565	6207745	A	20	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1240	292550	6207715	A	10	10	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 25
AA3	A3_1250	291970	6209770	A	40	20	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 22
AA3	A3_1260	291880	6209845	A	25	15	Concave	-	SST	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 22
AA3	A3_1270	291770	6209780	A	15	15	Straight	-	SST	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 22
AA3	A3_1280	291820	6209585	A	70	20	Straight	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 22
AA3	A3_1290	291580	6209225	A	20	15	Convex	-	-	-	M	Y	WC	N	N	Refer Cliff RMZ Plan 21
AA3	A3_1300	288745	6209225	O	15	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 33
AA3	A3_1310	288545	6209995	A	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 34
AA3	A3_1320	289685	6210025	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 32

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA7	A7_0001	290520	6215080	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA7	A7_0002	290535	6215265	A	5	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA7	A7_0003	290700	6215550	O	65	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0004	290845	6215405	O	20	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0005	290805	6215655	O	20	15	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0006	290880	6215690	O	20	10	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0007	290920	6215710	O	10	10	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0008	291025	6215685	O	20	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0009	291125	6215640	A	30	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0010	291145	6215630	A	10	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0011	291245	6215630	A	15	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0012	291270	6215615	A	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0013	291295	6215600	A	25	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0014	291175	6215395	O	60	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0015	291220	6215380	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0016	291275	6215375	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0017	291290	6215365	O	20	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0018	291310	6215355	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 42
AA7	A7_0019	291730	6215180	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0020	291785	6215195	O	25	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0021	291870	6215165	O,N	115	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0022	291970	6215135	N	30	10	Concave	-	-	-	-	Y	R	Y	-	-
AA7	A7_0023	292045	6215140	N	95	15	Concave	-	-	-	-	Y	R	Y	-	-
AA7	A7_0024	291900	6215355	O	30	10	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0025	291935	6215295	O	15	10	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0026	292210	6215150	O	20	15	Concave	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0027	292270	6215085	O	70	20	Concave	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0028	292370	6215145	O	40	15	Concave	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0029	292335	6215215	O	35	15	Concave	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0030	292335	6215260	O	15	15	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0031	292390	6215330	O	100	20	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0032	292425	6215385	O	15	20	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0033	292445	6215415	O	40	15	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0034	292465	6215465	O	65	15	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0035	292265	6215550	O	10	10	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0036	292275	6215595	O	35	15	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0037	292270	6215630	O	25	10	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0038	292280	6215660	O	20	10	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0039	292290	6215685	O	20	10	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0040	292275	6215780	O	20	10	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0041	292275	6215805	O	25	15	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0042	292280	6215865	O	100	20	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0043	292525	6216010	O	45	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0044	292495	6216050	O	10	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0045	292530	6216060	O	20	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0046	292495	6216070	O	15	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0047	292525	6216095	O	15	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0048	292495	6216170	A	45	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0049	292520	6216195	A,O	145	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0050	292500	6216280	A	35	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0051	292320	6216160	A	10	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0052	292325	6216170	A	10	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0053	292330	6216195	A	10	15	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0054	292345	6216235	A	65	20	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0055	292490	6216335	A	15	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0056	292500	6216370	A	130	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0057	292460	6216435	A	10	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0058	292480	6216440	A	20	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0059	292475	6216455	A	10	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0060	292480	6216480	A	10	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0061	292475	6216525	A	15	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0062	292460	6216620	A	115	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0063	292475	6216730	A	10	10	Convex	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0064	292490	6216810	A	80	15	Convex	-	REF,SST	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0065	292515	6216850	A	25	10	Convex	-	REF,SST	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0066	292540	6216875	A	20	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0067	292575	6216915	A	10	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0068	292590	6216930	A	15	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0069	292595	6216945	A	10	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0070	292620	6216975	A,O	55	20	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0071	292650	6217005	O	45	20	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0072	292665	6217030	O	10	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0073	292680	6217060	O	10	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0074	292705	6217095	O	35	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA7	A7_0075	292725	6217135	O	45	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0076	292750	6217170	O	35	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0077	292780	6217210	O	5	10	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0078	292815	6217265	O	20	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0079	292225	6216590	A	15	10	Concave	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0080	292205	6216685	A	120	25	Concave	-	REF	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0081	292205	6216755	A	20	15	Concave	-	REF	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0082	292215	6216800	A	35	15	Concave	-	REF	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0083	292210	6216855	A	15	10	Concave	-	REF	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0084	292180	6216950	A	45	10	Concave	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0085	292175	6217010	A	10	10	Concave	-	REF,SST	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0086	292175	6217045	A	65	15	Concave	-	REF,SST	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 41
AA7	A7_0087	292235	6216950	A	70	15	Concave	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0088	292340	6216955	A	210	30	Concave	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0089	292435	6217040	A	20	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0090	292445	6217070	A	15	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0091	292450	6217085	A	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0092	292490	6217105	A	20	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0093	292495	6217140	A	135	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0094	292565	6217205	A,O	100	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0095	292565	6217275	A,O	30	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0096	292590	6217320	A,O	70	25	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0097	292605	6217340	A	25	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0098	292625	6217380	A	15	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0099	292635	6217395	A	20	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0100	292665	6217400	A	25	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0101	292725	6217500	A	5	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0102	292730	6217490	A	210	25	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0103	292750	6217480	A	20	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0104	292780	6217515	A	35	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0105	292770	6217515	A	5	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0106	292810	6217530	A	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0107	292835	6217540	A	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0108	292825	6217540	A	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0109	292830	6217560	A	40	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0110	292870	6217565	A	65	30	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0111	292895	6217595	A	10	10	Convex	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0112	292860	6217595	A	20	15	Convex	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0113	292890	6217635	A	35	20	Convex	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0114	293000	6217305	O	30	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0115	293015	6217270	O	25	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0116	293015	6217250	O	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0117	293035	6217240	O	10	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0118	293105	6217310	O	20	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0119	293115	6217325	O	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0120	293105	6217340	O	15	10	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0121	293125	6217380	O	10	10	Straight	-	REF,SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0122	293105	6217370	O	20	10	Straight	-	REF,SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0123	293105	6217445	O	20	10	Convex	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0124	293065	6217470	O	30	10	Convex	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0125	293090	6217525	O	5	10	Convex	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0126	293105	6217555	O	10	10	Convex	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0130	293145	6217665	O	45	20	Concave	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0140	293135	6217725	O	50	20	Straight	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0150	293120	6217775	O	20	20	Straight	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0160	293045	6217915	O	30	15	Straight	-	SST	-	-	Y	SU	Y	N	Refer Cliff RMZ Plan 41
AA7	A7_0170	292780	6218575	A	20	20	Straight	-	REF,SST	-	-	Y	NU	Y	N	Refer Cliff RMZ Plan 39
AA7	A7_0180	292710	6218620	A	15	15	Concave	-	REF,SST	-	-	Y	NU	Y	N	Refer Cliff RMZ Plan 39
AA7	A7_0190	292480	6218825	A	20	15	Convex	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 38
AA7	A7_0200	292580	6219275	A	10	10	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 37
AA7	A7_0210	292595	6219295	A	15	10	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 37
AA7	A7_0220	292715	6219410	A	15	15	Concave	PO	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 37
AA7	A7_0230	292735	6219420	A	10	15	Concave	PO	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 37
AA7	A7_0240	292755	6219430	A	20	15	Concave	PO	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 37
AA7	A7_0250	293140	6220055	A	35	20	Concave	-	REF	-	-	Y	NU	Y	N	Refer Cliff RMZ Plan 36
AA7	A7_0260	293110	6220235	A	10	10	Straight	-	REF	-	-	Y	NU	Y	N	Refer Cliff RMZ Plan 36
AA7	A7_0270	292930	6220245	A	20	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 36
AA7	A7_0280	293005	6220610	O	35	20	Concave	-	REF,SST	-	-	Y	NU	Y	N	Refer Cliff RMZ Plan 35
AA7	A7_0290	293160	6217265	O	25	15	Convex	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0300	293195	6217220	O	40	20	Concave	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0310	293020	6217130	O	25	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0320	293150	6217065	O	95	30	Concave	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0330	293220	6217085	O	15	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0340	293125	6216975	O	30	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA7	A7_0350	293325	6217030	A	15	15	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA7	A7_0360	293350	6216990	A	70	20	Straight	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 40
AA8	A8_0001	283080	6210000	O	280	40	Straight	-	-	-	-	Y	RL	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0010	282850	6209935	O	25	20	Straight	-	-	-	-	Y	RL	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0020	283365	6210125	O	70	30	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0030	283285	6210160	O	130	45	Straight	-	SST	-	-	Y	R,RL	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0040	283075	6210095	O	35	25	Straight	-	SST	-	-	Y	RL	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0050	282995	6210090	O	65	25	Straight	-	SST	-	-	Y	RL	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0060	282885	6210080	O	55	20	Concave	-	SST	-	-	Y	R,RL	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0070	282730	6210035	O	25	15	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0080	282675	6210015	O	35	20	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0090	282615	6209995	O	65	20	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 53
AA8	A8_0100	281370	6211805	O	50	25	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 52
AA8	A8_0110	281410	6211765	O	30	20	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 52
AA8	A8_0120	281725	6211550	O	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 52
AA8	A8_0130	281835	6212045	O	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 51
AA8	A8_0140	281805	6212120	O	30	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 51
AA8	A8_0150	281515	6213275	O	25	20	Convex	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 50
AA8	A8_0160	281590	6213185	O	40	15	Convex	-	REF,SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 50
AA8	A8_0170	281695	6213100	O	35	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 50
AA8	A8_0180	282165	6212980	O	70	20	Concave	-	-	-	-	Y	I	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0190	282260	6212905	O	65	20	Straight	-	-	-	-	Y	I	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0200	282305	6212845	O	20	15	Straight	-	-	-	-	Y	I	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0210	282370	6212805	O	20	20	Concave	-	-	-	-	Y	I	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0220	282285	6212725	O	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0230	282405	6212585	O	50	25	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0240	282480	6212760	A,O	25	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0250	282435	6212755	O	30	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0260	282410	6212740	O	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0270	282455	6212695	O	40	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0280	282510	6212650	O	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0290	282530	6212605	O	35	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0300	282635	6212555	A	30	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 49
AA8	A8_0310	283005	6212440	A	30	20	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 48
AA8	A8_0320	283105	6212595	A	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 48
AA8	A8_0330	283555	6212615	A	20	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 47
AA8	A8_0340	283660	6212615	A	20	20	Concave	-	SST	-	-	Y	AR	Y	N	Refer Cliff RMZ Plan 47
AA8	A8_0350	283595	6212475	A	55	20	Concave	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 47
AA8	A8_0360	283655	6212470	A	40	20	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 47
AA8	A8_0370	284110	6212515	A	30	20	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 46
AA8	A8_0380	285345	6213615	A	30	25	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 45
AA8	A8_0390	285190	6214700	A	35	20	Straight	-	SST	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 44
AA8	A8_0400	285315	6214820	A	30	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 44
AA8	A8_0410	287130	6214510	A	25	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 43
AA8	A8_0420	287150	6214460	A	55	30	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 43
AA8	A8_0430	287125	6214265	A	85	25	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 43
AA8	A8_0440	287260	6214030	A	45	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 43
AA8	A8_0450	288100	6211795	A	10	10	Straight	EP,GP	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 54
AA8	A8_0460	288330	6211655	A	25	20	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0470	288360	6211610	A	25	15	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0480	288265	6211475	A	20	15	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0490	288265	6211305	A	15	15	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0500	288255	6211285	A	20	15	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0510	288235	6211275	A	25	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0520	288195	6211235	A	25	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0530	288105	6211240	A	20	20	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0540	288265	6211225	A	75	30	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0550	288230	6211180	A	20	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0560	288100	6211175	A	25	25	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0570	288070	6211170	A	10	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 56
AA8	A8_0580	287895	6210745	A	40	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 57
AA8	A8_0590	288015	6210645	A	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 57
AA8	A8_0600	288320	6210475	A	25	15	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 58
AA8	A8_0610	288455	6210600	A	35	15	Concave	-	-	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 58
AA8	A8_0620	288380	6210230	O	45	10	Convex	-	-	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 59
AA8	A8_0630	288375	6211365	A	25	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 55
AA8	A8_0640	288500	6211375	A	55	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 55
AA8	A8_0650	288650	6211325	A	45	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 55
AA8	A8_0660	288695	6211255	A	75	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 55
AA8	A8_0670	289095	6210600	O	10	10	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 60
AA8	A8_0680	289150	6210625	O	20	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 60
AA8	A8_0690	289225	6210635	O	40	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 60
AA8	A8_0700	289375	6210765	O	25	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 60
AA8	A8_0710	289520	6210650	O	25	30	Concave	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 60

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA8	A8_0720	289530	6210430	O	90	20	Concave	-	-	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 60
AA8	A8_0730	289500	6210380	O	15	15	Concave	-	-	-	-	Y	R	Y	Y	Refer Cliff RMZ Plan 60
AA9	A9_0001	289640	6213830	N	35	10	Straight	-	-	-	-	Y	R	Y	-	-
AA9	A9_0002	289555	6213930	O	20	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0003	289635	6213975	O	25	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0004	289670	6213960	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0005	289715	6213985	O,N	70	30	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0006	289760	6214000	O,N	60	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0007	289765	6214035	O	10	10	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0008	289795	6214040	O	15	15	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0009	289820	6214050	O	20	15	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0010	289805	6214070	O	20	25	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0011	289830	6214085	O	50	20	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0012	289830	6214110	O	10	15	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0013	289900	6214110	O	25	10	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0014	289880	6214160	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0015	289890	6214170	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0016	289905	6214195	O	20	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0017	289910	6214225	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0018	289920	6214245	O	35	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0019	289930	6214285	O	15	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0020	289945	6214340	O	45	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0021	289960	6214390	O	25	15	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0022	289975	6214430	O	35	15	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0023	290015	6214505	O	10	15	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0024	290045	6214555	O	85	20	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0025	290090	6214630	O	45	15	Straight	-	REF	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0027	290200	6214700	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0028	290215	6214780	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0029	290220	6214795	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0030	290275	6214880	O	30	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0031	290300	6214915	O	30	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0032	290460	6214915	O	20	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0033	290430	6214845	O	20	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0034	290420	6214820	O	20	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0035	290380	6214790	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0036	290395	6214780	O	35	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0037	290370	6214765	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0038	290375	6214755	O	25	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0039	290355	6214740	O	35	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0040	290355	6214715	O	15	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0041	290305	6214640	O	55	25	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0042	290275	6214605	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0043	290205	6214505	O	40	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0044	290180	6214485	O	10	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0045	290150	6214435	O	20	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0046	290135	6214390	O	60	25	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0047	290135	6214335	O	35	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0048	290115	6214315	O	105	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0049	290090	6214245	O	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0050	290075	6214215	O	15	10	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0051	290075	6214200	O	10	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 61
AA9	A9_0052	289865	6213830	N	25	15	Straight	LFM	SST	-	-	Y	R	Y	-	-
AA9	A9_0053	289895	6213820	N	15	20	Straight	-	SST	-	-	Y	R	Y	-	-
AA9	A9_0054	289925	6213805	N	10	15	Straight	-	SST	-	-	Y	R	Y	-	-
AA9	A9_0055	289960	6213780	N	75	25	Straight	-	SST	-	-	Y	R	Y	-	-
AA9	A9_0056	289975	6213785	N	65	30	Straight	-	SST	-	-	Y	R	Y	-	-
AA9	A9_0057	290075	6213890	N	30	20	Straight	-	REF	-	-	Y	R	Y	-	-
AA9	A9_0058	290060	6213890	N	5	10	Straight	-	REF	-	-	Y	R	Y	-	-
AA9	A9_0059	290055	6213880	N	15	10	Straight	-	REF	-	-	Y	R	Y	-	-
AA9	A9_0060	290015	6213890	N	15	10	Straight	LFM	REF	-	-	Y	R	Y	-	-
AA9	A9_0061	289995	6213900	N	15	10	Straight	LFM	REF	-	-	Y	R	Y	-	-
AA9	A9_0062	289965	6213925	N	15	10	Convex	LFM	REF	-	-	Y	R	Y	-	-
AA9	A9_0063	289965	6213940	N	15	15	Convex	LFM	REF	-	-	Y	R	Y	-	-
AA9	A9_0064	289985	6213985	N	15	10	Convex	LFM	REF	-	-	Y	R	Y	-	-
AA9	A9_0065	289990	6214000	N	10	15	Convex	LFM	REF	-	-	Y	R	Y	-	-
AA9	A9_0066	289970	6213995	N	90	30	Convex	LFM	REF	-	-	Y	R	Y	-	-
AA9	A9_0067	289990	6214030	N	5	10	Concave	LFM	-	-	-	Y	R	Y	-	-
AA9	A9_0068	290015	6214065	N	65	25	Concave	LFM	-	-	-	Y	R	Y	-	-
AA9	A9_0069	290020	6214095	N	10	10	Concave	-	-	-	-	Y	R	Y	-	-
AA9	A9_0070	290050	6214085	N	15	10	Concave	-	-	-	-	Y	R	Y	-	-
AA9	A9_0071	290060	6214110	N	20	15	Concave	-	-	-	-	Y	R	Y	-	-
AA9	A9_0080	289285	6214530	A	110	20	Convex	-	-	-	-	Y	OS,R	Y	N	Refer Cliff RMZ Plan 62
AA9	A9_0090	289170	6214345	A,O	35	25	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 62

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
AA9	A9_0100	289120	6214345	A	75	20	Concave	-	-	-	-	Y	OS,R	Y	N	Refer Cliff RMZ Plan 62
AA9	A9_0110	288750	6214210	A	135	35	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 63
AA9	A9_0120	288605	6214175	A	35	20	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 63
AA9	A9_0130	287975	6214435	A	25	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 64
AA9	A9_0140	287680	6214660	A	135	30	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 65
AA9	A9_0150	287525	6214720	A	80	15	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 65
AA9	A9_0160	287465	6214610	A	35	25	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 65
AA9	A9_0170	286470	6214775	A	25	20	Straight	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 66
AA9	A9_0180	286310	6215110	A	70	25	Convex	-	-	-	-	Y	R	Y	N	Refer Cliff RMZ Plan 67
AA9	A9_0190	285795	6216465	A	35	15	Straight	-	CPW,SDR	-	-	N	RL	Y	N	Refer Cliff RMZ Plan 68
AA9	A9_0200	287120	6216940	A	65	25	Straight	-	MSW	-	-	N	RL	Y	N	Refer Cliff RMZ Plan 69
NC	NC_0001	301430	6220640	O	25	15	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0010	301390	6220600	O	20	15	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0020	301625	6220385	O	20	25	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0030	301710	6220395	O	20	20	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0040	301835	6220400	O	10	15	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0050	301870	6220375	O	60	30	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0060	301905	6220345	O	20	30	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0070	301935	6220245	O	105	20	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0080	301990	6220265	O	25	20	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0090	301395	6220175	O	30	15	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0100	301705	6220075	O	45	20	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0110	301575	6220000	O	30	20	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0120	301540	6220035	O	25	10	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0130	301470	6220000	O	110	25	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 1
NC	NC_0140	301425	6219915	O	95	25	Concave	-	-	-	-	Y	OS, WC	Y	Y	Refer Cliff RMZ Plan 1
NC	NC_0150	301905	6219635	A,O	340	40	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0160	301980	6219685	A	35	15	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0170	301960	6219430	A,O	65	20	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0180	301995	6219355	A,O	55	25	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0190	302190	6219335	A	25	15	Convex	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0200	302245	6219320	A	25	10	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0210	301895	6219300	O	35	15	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0220	301875	6219270	O	35	15	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0230	301890	6219045	A	70	20	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0240	301915	6219030	A	30	15	Straight	-	-	-	-	Y	WC	Y	Y	Refer Cliff RMZ Plan 3
NC	NC_0250	301805	6219385	O	20	15	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0260	301730	6219280	O	15	15	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0270	301565	6219320	O	95	15	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0280	301485	6219235	O	35	15	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0290	301420	6219175	O	30	20	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0300	301380	6219100	O	50	20	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0310	301525	6219165	O	20	20	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0320	301540	6219180	O	25	25	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0330	301615	6219175	O	75	25	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0340	301515	6219065	O	55	25	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0350	301595	6218890	O	45	20	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 3
NC	NC_0360	301745	6218570	A	30	15	Convex	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0370	301720	6218520	A	20	15	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0380	301610	6218465	A	15	15	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0390	301590	6218445	A	25	20	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0400	301425	6218550	O	115	30	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0410	301305	6218450	O	20	15	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0420	301430	6218395	O	10	15	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0430	301370	6218400	O	10	10	Straight	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0440	301340	6218330	O	110	30	Straight	-	-	-	-	Y	WC	Y	Y	Refer Cliff RMZ Plan 4
NC	NC_0450	301135	6218265	O	20	20	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0460	301095	6218240	O	40	20	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0470	301125	6218200	O	45	20	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0480	301015	6218175	O	35	15	Convex	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0490	300845	6218110	O	15	15	Straight	-	-	-	-	Y	OS	Y	N	Refer Cliff RMZ Plan 4
NC	NC_0500	300600	6217690	O	90	25	Convex	-	-	-	O	Y	WC	N	N	Refer Cliff RMZ Plan 5
NC	NC_0510	300540	6217675	O	30	15	Concave	-	-	-	O	Y	WC	N	N	Refer Cliff RMZ Plan 5
NC	NC_0520	300415	6217620	O	110	25	Concave	-	-	-	O	Y	WC	N	N	Refer Cliff RMZ Plan 5
NC	NC_0530	300710	6217600	O	35	15	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 5
NC	NC_0540	300695	6217645	O	25	15	Concave	-	-	-	-	Y	WC	Y	N	Refer Cliff RMZ Plan 5
NC	NC_0550	300625	6217630	O	65	20	Convex	-	-	-	O	Y	WC	N	N	Refer Cliff RMZ Plan 5
NC	NC_0560	300515	6217600	O	160	30	Concave	-	-	-	O	Y	WC	N	N	Refer Cliff RMZ Plan 5
NC	NC_0570	300395	6217525	O	115	20	Straight	-	-	-	O	Y	WC	N	N	Refer Cliff RMZ Plan 5
NC	NC_0580	300315	6217365	O	50	20	Straight	-	-	-	O	Y	WC	N	N	Refer Cliff RMZ Plan 5
NC	NC_0590	301050	6217615	O	75	20	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 6
NC	NC_0600	301045	6217560	A	25	10	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 6
NC	NC_0610	300950	6217515	O	65	15	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 6
NC	NC_0620	300900	6217445	O	50	15	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 6

Attachment RA
Major Cliff Line Matrix

Characterisation																
								Ecological Importance								
Domain	Cliff ID	Centroid Easting (MGA)	Centroid Northing (MGA)	Cliff Location (relative to Extent of Longwall Mining Area)	Overall Cliff Length (m)	Maximum Height (m)	Shape	Threatened Species Recorded during Project Surveys Within 50 m	EECs Present Above or Below Cliff Line	Relevant DECC Area	Relevant SCA Special Area	Significant Watercourse (i.e. 3rd Order or Above/ Perennial Stream) Within 50 m	Land Zoning	Public Visibility and Access	Known Aboriginal Heritage Site Within 50 m	Cliff Line Risk Management Zone
NC	NC_0630	300785	6217295	O	30	10	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 6
NC	NC_0640	300695	6216620	O	70	25	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 7
NC	NC_0650	300715	6216575	O	10	10	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 7
NC	NC_0660	301040	6216640	A	50	20	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 7
NC	NC_0670	300960	6216600	A,O	45	15	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 7
NC	NC_0680	300950	6216400	O	35	15	Concave	LE,PoA	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 7
NC	NC_0690	301315	6216305	A	50	20	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 8
NC	NC_0700	301370	6216310	A	20	10	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 8
NC	NC_0710	301370	6216015	A	30	20	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 8
NC	NC_0720	301855	6216095	A	30	15	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 9
NC	NC_0730	301940	6216105	A	145	25	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 9
NC	NC_0740	302175	6216155	A	70	25	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 9
NC	NC_0750	302280	6216200	A	70	15	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 9
NC	NC_0760	302025	6215975	A	35	20	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 9
NC	NC_0770	302150	6215320	A	45	10	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 10
NC	NC_0780	302580	6214680	A	20	20	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 12
NC	NC_0790	302645	6214610	A	50	15	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 12
NC	NC_0800	302675	6214560	A	50	20	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 12
NC	NC_0810	302595	6214470	A	20	15	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 12
NC	NC_0820	302560	6214445	A	55	20	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 12
NC	NC_0830	303790	6213175	A	40	15	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 13
NC	NC_0840	304005	6213840	A	40	20	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 14
NC	NC_0850	304075	6213845	A	50	20	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 14
NC	NC_0860	304225	6213745	A	40	25	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 14
NC	NC_0870	304590	6213355	A	40	20	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 15
NC	NC_0880	304615	6213325	A	20	15	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 15
NC	NC_0890	304945	6212615	A	15	10	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 16
NC	NC_0900	305035	6212665	A	15	10	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 16
NC	NC_0910	305080	6212655	A	25	15	Convex	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 16
NC	NC_0920	305745	6212115	A	15	10	Concave	-	-	DSCA	O	Y	SCA	Y	N	Refer Cliff RMZ Plan 17
NC	NC_0930	305760	6212150	A	30	15	Straight	-	-	DSCA	O	Y	SCA	Y	N	Refer Cliff RMZ Plan 17
NC	NC_0940	305845	6211960	A,O	10	15	Straight	-	-	DSCA	O	Y	SCA	Y	N	Refer Cliff RMZ Plan 17
NC	NC_0950	302310	6211380	O	15	15	Straight	-	-	DSCA	O	Y	WC	Y	Y	Refer Cliff RMZ Plan 18
NC	NC_0960	302290	6211340	O	25	10	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 18
NC	NC_0970	302320	6211315	O	30	15	Concave	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 18
NC	NC_0980	303655	6215740	A	40	25	Straight	-	-	DSCA	O	Y	WC	Y	N	Refer Cliff RMZ Plan 11
NC	NC_0990	304090	6218590	O	25	15	Straight	-	-	-	-	y	WC	Y	N	Refer Cliff RMZ Plan 2

Note: Grey shading indicates the major cliff line is outside the study area.

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects								
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA2	A2_0001	410	1025	3.48	0.05	0.08	0.8	1.2	2.4	-5.25
AA2	A2_0010	280	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	2.4	-5.25
AA2	A2_0020	295	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	2.4	-5.25
AA3	A3_0001	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0002	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0003	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0004	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0005	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0006	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0007	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0008	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0009	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0010	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0011	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0012	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0013	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0014	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0015	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0016	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0017	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0018	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0019	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0020	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0021	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0022	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0023	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0024	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0025	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0026	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0027	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0028	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0029	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0030	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0031	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0032	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0033	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0034	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0035	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0036	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0037	420	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0038	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0039	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0040	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0041	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0042	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0043	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0044	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0045	435	25	0.24	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0046	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0047	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0048	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0049	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0050	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0051	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0052	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0053	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0054	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0055	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0056	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0057	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0058	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0059	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0060	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0061	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0062	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0063	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0064	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0065	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0066	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0067	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0068	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0069	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0070	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0071	430	25	0.34	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0072	455	50	0.59	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0073	450	50	0.84	0.01	< 0.01	0.2	< -0.2	1.65	-2.85
AA3	A3_0074	435	25	0.40	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0075	440	25	0.42	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0076	440	25	0.41	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects								
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA3	A3_0077	445	25	0.37	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0078	435	25	0.35	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0079	430	25	0.31	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0080	440	125	1.35	0.02	< 0.01	0.3	< -0.2	1.65	-2.85
AA3	A3_0081	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0082	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0083	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0084	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0085	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0086	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0087	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0088	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0089	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0090	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0091	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0092	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0093	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0094	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0095	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0096	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0097	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0098	445	25	0.26	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0099	445	50	0.38	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0100	445	50	0.41	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0101	445	50	0.46	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0102	450	50	0.47	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0110	435	75	0.78	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0120	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0130	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0140	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0150	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0160	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0170	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0180	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0190	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0200	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0210	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0220	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0230	420	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0240	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0250	420	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0260	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0270	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0280	385	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0290	375	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0300	375	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0310	375	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0320	375	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0330	375	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0340	365	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0350	385	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0360	370	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0370	345	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0380	350	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0390	355	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0400	340	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0410	345	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0420	330	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0430	325	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0440	310	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0450	315	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0460	340	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0470	380	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0480	385	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0490	385	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0500	330	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0510	330	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0520	325	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0530	375	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0540	370	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0550	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0560	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0570	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0580	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects									
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA3	A3_0590	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0600	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0610	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0620	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0630	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0640	420	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0650	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0660	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0670	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0680	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0690	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0700	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0710	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0720	400	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0730	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0740	395	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0750	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0760	410	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0770	410	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0780	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0790	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0800	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0810	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0820	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0830	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0840	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0850	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0860	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0870	445	25	0.30	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0880	435	25	0.28	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0890	425	50	0.42	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_0900	435	75	0.81	0.01	< 0.01	0.2	< -0.2	1.65	-2.85
AA3	A3_0910	425	600	6.99	0.06	0.02	1.0	0.3	1.65	-2.85
AA3	A3_0920	435	200	2.41	0.04	< 0.01	0.5	< -0.2	1.65	-2.85
AA3	A3_0930	420	300	4.08	0.06	0.01	0.9	0.2	1.65	-2.85
AA3	A3_0940	430	500	6.30	0.06	0.02	1.0	0.3	1.65	-2.85
AA3	A3_0950	430	800	7.03	0.06	0.10	1.0	1.5	1.65	-2.85
AA3	A3_0960	420	950	7.04	0.04	0.15	0.6	2.3	1.65	-2.85
AA3	A3_0970	415	950	5.68	0.04	0.15	0.6	2.3	1.65	-2.85
AA3	A3_0980	425	775	2.00	0.04	0.02	0.7	0.4	1.65	-2.85
AA3	A3_0990	420	1000	5.10	0.09	0.02	1.3	0.4	1.65	-2.85
AA3	A3_1000	425	1050	5.25	0.09	0.04	1.3	0.7	1.65	-2.85
AA3	A3_1010	420	1125	5.25	0.05	0.11	0.8	1.6	1.65	-2.85
AA3	A3_1020	415	1200	5.25	0.05	0.16	0.7	2.3	1.65	-2.85
AA3	A3_1030	420	875	2.90	0.05	0.03	0.8	0.4	1.65	-2.85
AA3	A3_1040	425	750	1.85	0.08	0.02	1.2	0.3	1.65	-2.85
AA3	A3_1050	425	750	2.24	0.08	0.02	1.3	0.3	1.65	-2.85
AA3	A3_1060	425	800	2.74	0.09	0.02	1.3	0.3	1.65	-2.85
AA3	A3_1070	410	850	3.26	0.09	0.02	1.3	0.3	1.65	-2.85
AA3	A3_1080	415	1125	4.68	0.09	0.15	1.3	2.2	1.65	-2.85
AA3	A3_1090	415	1050	3.04	0.04	0.03	0.7	0.5	1.65	-2.85
AA3	A3_1100	415	750	1.96	0.08	0.02	1.2	0.3	1.65	-2.85
AA3	A3_1110	430	750	2.67	0.09	0.02	1.3	0.3	1.65	-2.85
AA3	A3_1120	400	1150	3.76	0.05	0.07	0.7	1.1	1.65	-2.85
AA3	A3_1130	390	1100	3.93	0.05	0.04	0.7	0.6	1.65	-2.85
AA3	A3_1140	380	925	3.83	0.04	0.03	0.6	0.5	1.65	-2.85
AA3	A3_1150	395	1150	6.13	0.06	0.19	0.9	2.9	1.65	-2.85
AA3	A3_1160	395	1150	3.89	0.06	0.19	0.8	2.8	1.65	-2.85
AA3	A3_1170	395	900	4.51	0.04	0.04	0.7	0.5	1.65	-2.85
AA3	A3_1180	390	850	4.46	0.04	0.03	0.6	0.5	1.65	-2.85
AA3	A3_1190	405	825	4.25	0.05	0.03	0.7	0.5	1.65	-2.85
AA3	A3_1200	400	1025	4.34	0.05	0.17	0.8	2.5	1.65	-2.85
AA3	A3_1210	400	700	5.35	0.04	0.05	0.6	0.8	1.65	-2.85
AA3	A3_1220	405	950	4.33	0.05	0.06	0.7	1.0	1.65	-2.85
AA3	A3_1230	410	1000	4.30	0.05	0.11	0.7	1.7	1.65	-2.85
AA3	A3_1240	410	900	4.25	0.05	0.03	0.7	0.5	1.65	-2.85
AA3	A3_1250	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_1260	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_1270	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_1280	440	75	0.73	0.01	< 0.01	0.2	< -0.2	1.65	-2.85
AA3	A3_1290	445	225	2.22	0.04	< 0.01	0.6	< -0.2	1.65	-2.85
AA3	A3_1300	450	< 20	0.23	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_1310	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85
AA3	A3_1320	465	25	0.26	< 0.01	< 0.01	< 0.2	< -0.2	1.65	-2.85

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects								
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA7	A7_0001	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0002	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0003	480	75	0.63	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0004	475	< 20	0.21	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0005	475	125	1.00	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0006	480	125	1.02	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0007	480	125	1.02	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0008	465	100	0.75	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0009	465	75	0.70	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0010	465	75	0.70	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0011	485	100	1.05	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0012	485	75	1.06	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0013	480	75	1.03	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0014	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0015	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0016	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0017	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0018	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0019	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0020	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0021	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0022	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA7	A7_0023	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA7	A7_0024	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0025	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0026	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0027	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0028	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0029	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0030	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0031	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0032	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0033	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0034	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0035	495	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0036	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0037	495	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0038	495	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0039	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0040	500	< 20	0.24	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0041	500	25	0.28	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0042	500	25	0.40	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0043	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0044	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0045	495	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0046	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0047	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0048	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0049	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0050	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0051	495	50	0.60	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0052	490	50	0.59	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0053	490	50	0.57	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0054	480	50	0.61	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0055	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0056	495	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0057	475	25	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0058	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0059	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0060	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0061	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0062	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0063	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0064	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0065	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0066	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0067	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0068	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0069	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0070	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0071	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0072	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0073	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0074	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects								
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA7	A7_0075	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0076	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0077	495	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0078	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0079	485	125	1.12	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0080	480	150	1.30	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0081	485	125	1.33	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0082	480	100	1.26	0.02	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0083	470	100	1.36	0.02	< 0.01	0.3	< -0.2	1.35	-2.25
AA7	A7_0084	475	175	2.11	0.03	< 0.01	0.5	< -0.2	1.35	-2.25
AA7	A7_0085	480	200	1.92	0.03	< 0.01	0.4	< -0.2	1.35	-2.25
AA7	A7_0086	480	250	2.20	0.03	< 0.01	0.5	< -0.2	1.35	-2.25
AA7	A7_0087	475	125	1.20	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0088	475	50	0.66	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0089	475	25	0.32	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0090	480	25	0.33	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0091	485	25	0.33	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0092	465	25	0.31	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0093	475	50	0.36	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0094	460	50	0.40	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0095	475	75	0.54	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0096	475	100	0.80	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0097	480	100	0.75	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0098	485	100	0.91	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0099	480	125	0.97	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0100	470	100	0.86	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0101	495	125	1.30	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0102	480	125	1.30	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0103	465	75	1.01	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0104	470	75	1.00	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0105	480	75	1.05	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0106	470	50	0.76	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0107	460	50	0.56	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0108	470	50	0.66	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0109	480	50	0.74	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0110	460	25	0.47	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0111	465	25	0.33	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0112	485	50	0.50	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0113	485	25	0.38	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0114	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0115	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0116	480	< 20	0.22	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0117	465	25	0.23	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0118	460	< 20	0.21	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0119	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0120	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0121	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0122	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0123	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0124	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0125	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0126	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0130	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0140	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0150	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0160	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0170	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0180	485	25	0.23	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0190	465	125	0.87	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0200	495	125	0.92	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0210	490	125	0.87	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0220	500	100	0.67	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0230	500	75	0.65	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0240	495	75	0.61	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0250	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0260	505	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0270	505	75	0.69	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0280	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0290	475	25	0.28	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0300	475	50	0.38	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0310	480	50	0.37	< 0.01	< 0.01	< 0.2	< -0.2	1.35	-2.25
AA7	A7_0320	475	125	1.08	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0330	485	125	1.14	0.01	< 0.01	0.2	< -0.2	1.35	-2.25
AA7	A7_0340	480	200	1.88	0.02	< 0.01	0.3	< -0.2	1.35	-2.25

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects								
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA7	A7_0350	485	300	2.75	0.02	< 0.01	0.3	< -0.2	1.35	-2.25
AA7	A7_0360	480	525	3.37	0.02	0.02	0.3	0.3	1.35	-2.25
AA8	A8_0001	410	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0010	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0020	395	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0030	410	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0040	390	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0050	400	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0060	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0070	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0080	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0090	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0100	-	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0110	-	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0120	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0130	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0140	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0150	420	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0160	430	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0170	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0180	415	75	0.70	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0190	420	75	0.88	0.01	< 0.01	0.2	< -0.2	1.2	-1.95
AA8	A8_0200	425	75	0.85	0.01	< 0.01	0.2	< -0.2	1.2	-1.95
AA8	A8_0210	435	100	1.19	0.01	< 0.01	0.2	< -0.2	1.2	-1.95
AA8	A8_0220	440	25	0.31	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0230	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0240	445	75	1.16	0.02	< 0.01	0.3	< -0.2	1.2	-1.95
AA8	A8_0250	430	50	1.02	0.01	< 0.01	0.2	< -0.2	1.2	-1.95
AA8	A8_0260	420	50	0.73	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0270	435	25	0.51	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0280	440	25	0.31	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0290	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0300	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0310	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0320	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0330	425	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0340	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0350	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0360	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0370	430	25	0.29	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0380	465	150	0.96	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0390	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0400	475	25	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0410	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0420	450	25	0.34	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0430	460	175	1.83	0.03	< 0.01	0.5	< -0.2	1.2	-1.95
AA8	A8_0440	470	825	2.20	0.03	0.03	0.5	0.4	1.2	-1.95
AA8	A8_0450	460	925	3.87	0.05	0.04	0.7	0.6	1.2	-1.95
AA8	A8_0460	435	650	1.68	0.06	0.02	0.9	0.3	1.2	-1.95
AA8	A8_0470	440	650	1.51	0.07	0.02	1.0	0.3	1.2	-1.95
AA8	A8_0480	445	950	4.15	0.03	0.12	0.5	1.8	1.2	-1.95
AA8	A8_0490	440	900	2.35	0.03	0.03	0.5	0.4	1.2	-1.95
AA8	A8_0500	440	875	2.35	0.03	0.03	0.5	0.4	1.2	-1.95
AA8	A8_0510	440	825	2.35	0.03	0.02	0.5	0.4	1.2	-1.95
AA8	A8_0520	435	700	2.12	0.04	0.02	0.7	0.3	1.2	-1.95
AA8	A8_0530	440	675	2.31	0.07	0.01	1.0	0.2	1.2	-1.95
AA8	A8_0540	440	875	2.32	0.03	0.03	0.5	0.4	1.2	-1.95
AA8	A8_0550	445	675	2.03	0.05	0.02	0.8	0.3	1.2	-1.95
AA8	A8_0560	450	800	3.58	0.05	0.03	0.8	0.4	1.2	-1.95
AA8	A8_0570	450	875	3.58	0.05	0.10	0.7	1.4	1.2	-1.95
AA8	A8_0580	440	925	3.64	0.03	0.11	0.5	1.6	1.2	-1.95
AA8	A8_0590	445	775	3.88	0.04	0.05	0.6	0.7	1.2	-1.95
AA8	A8_0600	450	50	0.47	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0610	450	75	0.68	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0620	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0630	435	925	4.21	0.04	0.09	0.7	1.4	1.2	-1.95
AA8	A8_0640	445	600	1.82	0.07	0.02	1.0	0.3	1.2	-1.95
AA8	A8_0650	455	675	1.37	0.03	0.02	0.4	0.3	1.2	-1.95
AA8	A8_0660	455	675	1.49	0.03	0.02	0.4	0.3	1.2	-1.95
AA8	A8_0670	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0680	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0690	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0700	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0710	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects								
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA8	A8_0720	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA8	A8_0730	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.2	-1.95
AA9	A9_0001	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0002	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0003	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0004	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0005	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0006	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0007	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0008	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0009	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0010	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0011	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0012	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0013	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0014	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0015	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0016	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0017	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0018	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0019	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0020	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0021	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0022	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0023	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0024	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0025	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0027	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0028	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0029	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0030	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0031	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0032	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0033	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0034	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0035	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0036	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0037	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0038	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0039	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0040	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0041	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0042	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0043	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0044	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0045	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0046	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0047	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0048	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0049	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0050	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0051	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0052	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0053	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0054	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0055	470	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0056	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0057	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0058	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0059	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0060	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0061	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0062	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0063	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0064	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0065	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0066	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0067	455	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0068	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0069	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0070	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0071	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	-	-
AA9	A9_0080	480	< 20	0.26	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0090	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65

Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects									
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
AA9	A9_0100	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0110	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0120	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0130	445	50	0.50	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0140	450	25	0.42	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0150	450	25	0.32	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0160	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0170	480	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0180	475	50	0.40	< 0.01	< 0.01	< 0.2	< -0.2	1.05	-1.65
AA9	A9_0190	685	1225	0.95	0.02	0.01	0.3	0.2	1.05	-1.65
AA9	A9_0200	680	1300	1.67	0.04	0.06	0.6	0.9	1.05	-1.65
NC	NC_0001	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0010	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0020	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0030	475	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0040	515	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0050	515	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0060	510	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0070	490	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0080	520	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0090	495	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0100	410	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0110	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0120	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0130	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0140	505	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0150	395	75	0.64	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0160	465	100	0.86	0.01	< 0.01	0.2	< -0.2	1.5	-2.85
NC	NC_0170	390	50	0.58	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0180	400	75	0.90	0.01	< 0.01	0.2	< -0.2	1.5	-2.85
NC	NC_0190	485	325	1.88	0.02	< 0.01	0.3	< -0.2	1.5	-2.85
NC	NC_0200	490	400	2.37	0.03	< 0.01	0.4	< -0.2	1.5	-2.85
NC	NC_0210	380	25	0.30	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0220	385	25	0.25	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0230	460	50	0.56	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0240	470	50	0.66	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0250	390	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0260	400	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0270	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0280	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0290	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0300	500	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0310	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0320	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0330	410	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0340	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0350	390	< 20	0.23	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0360	465	125	1.20	0.02	< 0.01	0.3	< -0.2	1.5	-2.85
NC	NC_0370	470	125	0.99	0.01	< 0.01	0.2	< -0.2	1.5	-2.85
NC	NC_0380	430	50	0.54	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0390	430	50	0.49	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0400	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0410	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0420	390	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0430	385	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0440	385	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0450	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0460	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0470	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0480	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0490	485	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0500	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0510	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0520	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0530	375	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0540	400	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0550	395	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0560	400	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0570	395	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0580	380	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0590	440	50	0.46	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0600	460	75	0.53	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0610	440	50	0.68	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0620	455	75	1.10	0.01	< 0.01	0.2	< -0.2	1.5	-2.85

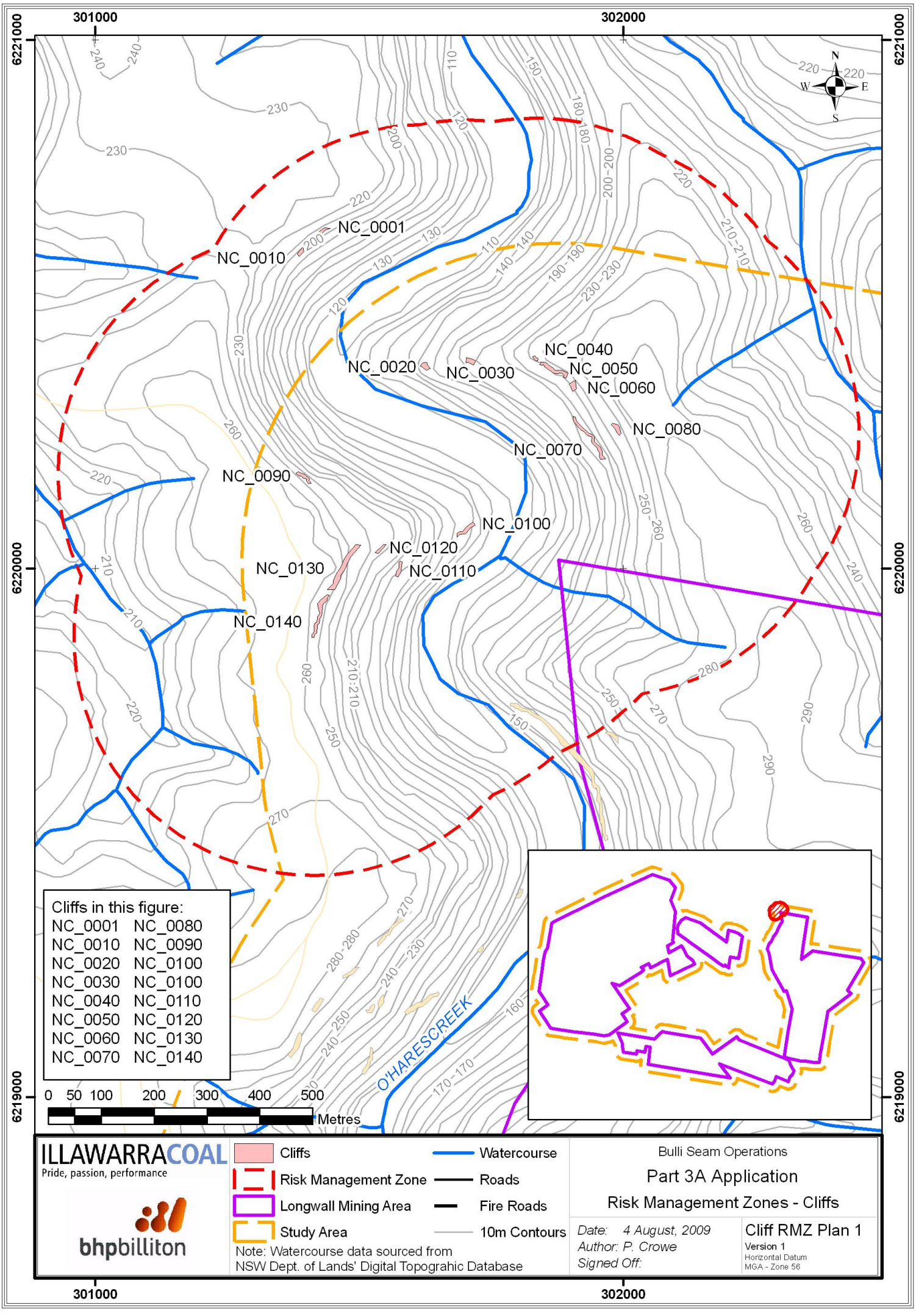
Attachment RA
Major Cliff Line Matrix

		Predicted Subsidence Effects								
			Systematic Subsidence Parameters (Base Plan)						Systematic Subsidence Parameters (Domain Based)	
Domain	Cliff ID	Minimum Depth of Cover at Base of Cliff (m)	Total Maximum Subsidence Predicted (mm)	Total Maximum Predicted Tilt (mm/m)	Total Maximum Predicted Curvature (Hogging) (1/km)	Total Maximum Predicted Curvature (Sagging) (1/km)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)	Estimated Average Tensile Strains (mm/m)	Estimated Average Compressive Strains (mm/m)
NC	NC_0630	455	125	1.65	0.03	< 0.01	0.5	< -0.2	1.5	-2.85
NC	NC_0640	435	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0650	440	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0660	450	300	3.20	0.03	0.02	0.4	0.2	1.5	-2.85
NC	NC_0670	425	125	1.63	0.02	< 0.01	0.2	< -0.2	1.5	-2.85
NC	NC_0680	410	< 20	0.26	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0690	420	25	0.29	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0700	425	25	0.30	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0710	395	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0720	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0730	465	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0740	465	25	0.27	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0750	475	50	0.37	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0760	390	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0770	380	25	0.25	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0780	400	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0790	385	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0800	395	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0810	380	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0820	390	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0830	430	150	1.98	0.03	< 0.01	0.4	< -0.2	1.5	-2.85
NC	NC_0840	450	25	0.33	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0850	455	25	0.33	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0860	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0870	410	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0880	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0890	400	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0900	450	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0910	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0920	420	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0930	445	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0940	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0950	415	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0960	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0970	405	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85
NC	NC_0980	455	700	1.55	0.07	0.02	1.1	0.3	1.5	-2.85
NC	NC_0990	460	< 20	< 0.2	< 0.01	< 0.01	< 0.2	< -0.2	1.5	-2.85

Note: Grey shading indicates the major cliff line is outside the study area.

ATTACHMENT RB

RISK MANAGEMENT ZONES FOR CLIFF LINES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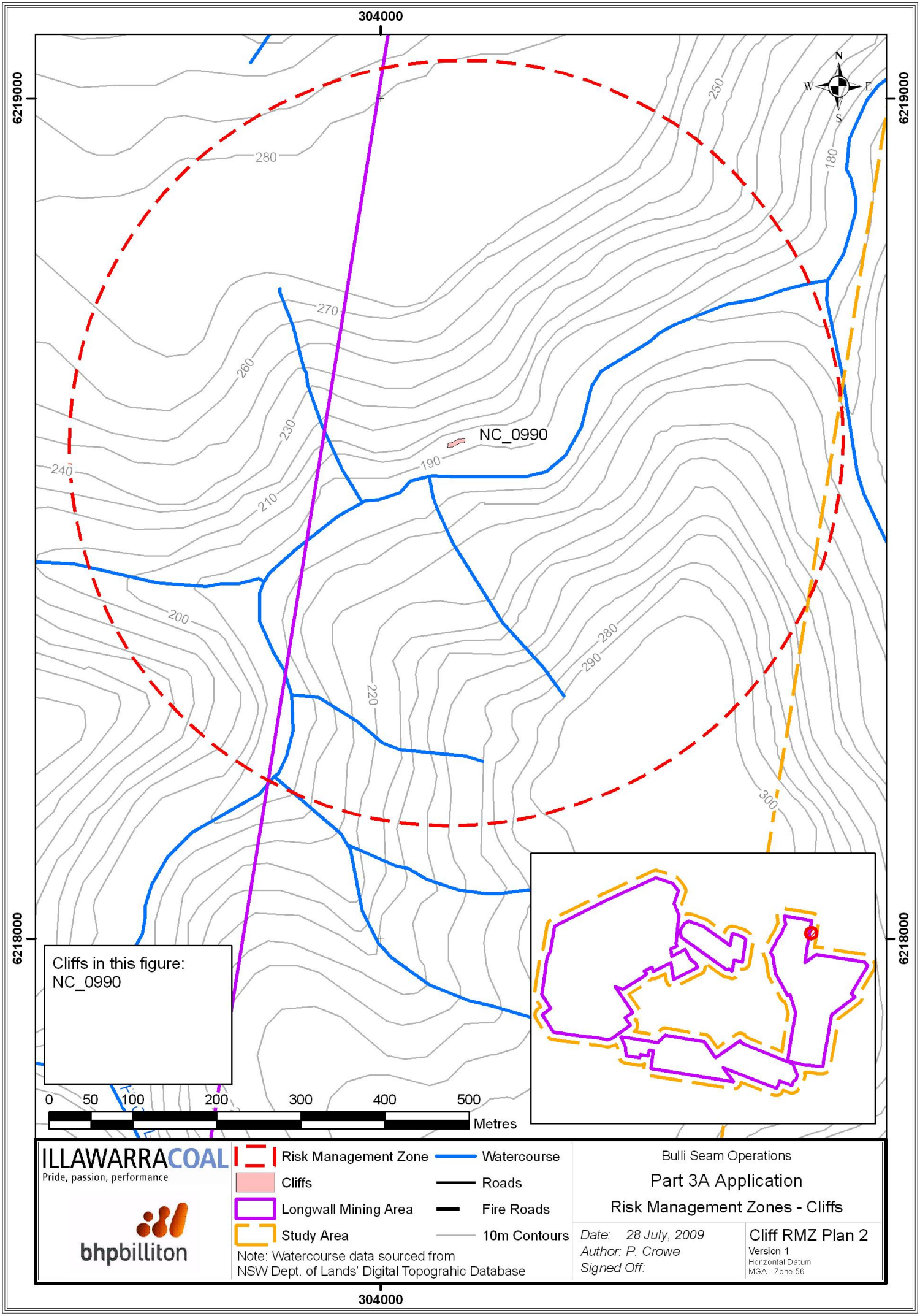
NC_0090
NC_0100
NC_0110
NC_0120
NC_0130
NC_0140
O'HARESCREEK
Cliffs in this figure:
NC_0001 NC_0080
NC_0010 NC_0090
NC_0020 NC_0100
NC_0030 NC_0100
NC_0040 NC_0110
NC_0050 NC_0120
NC_0060 NC_0130
NC_0070 NC_0140
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Cliffs
Risk Management Zone
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 1
Version 1
Horizontal Datum
MGA - Zone 56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W
E
S
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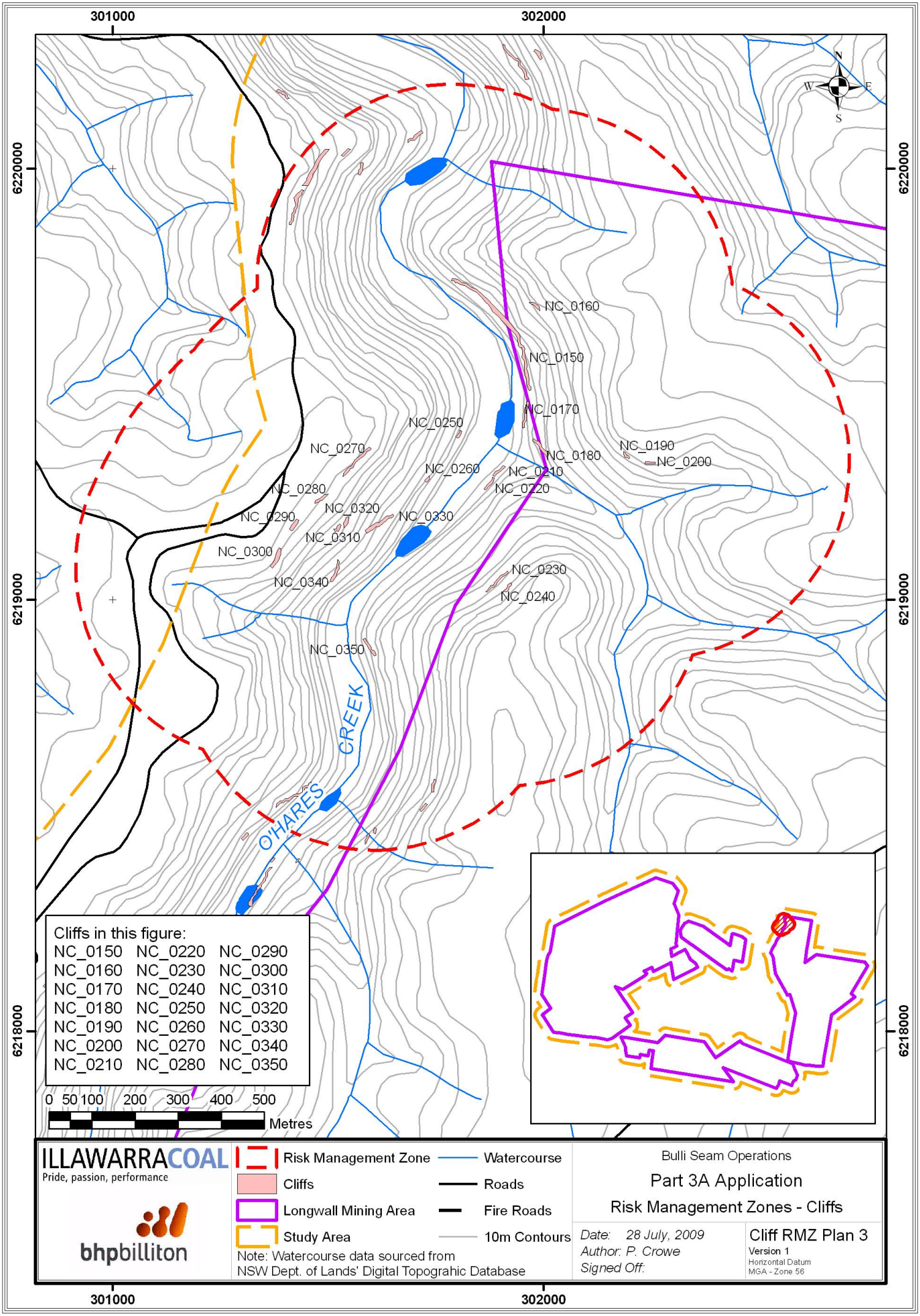
270
260
250
240
230
210
200
190
180
220
290
300
NC_0990
Cliffs in this figure:
NC_0990
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 2
Version 1
Horizontal Datum
MGA - Zone 56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W
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S
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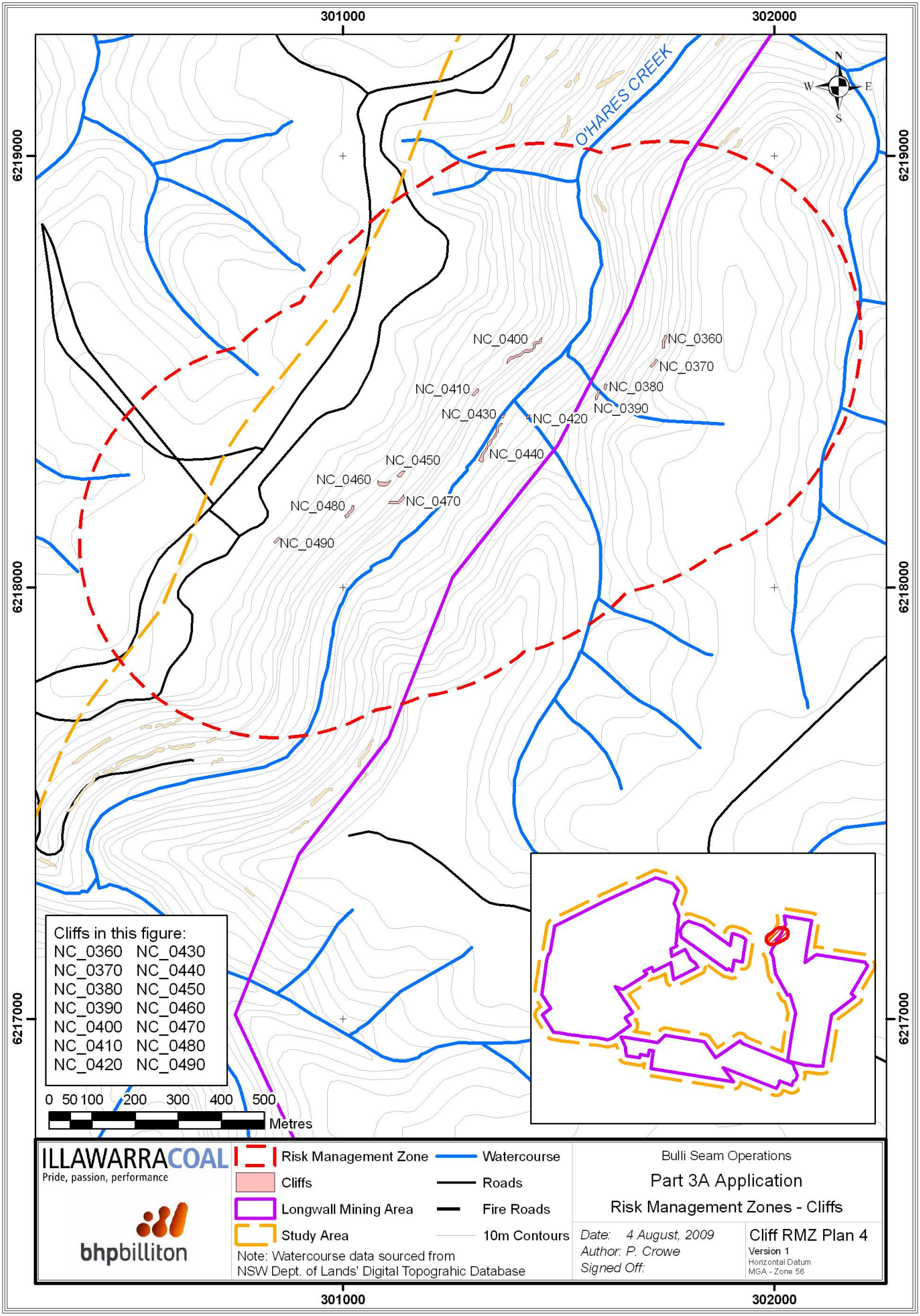
NC_0150
NC_0170
NC_0250
NC_0270
NC_0180
NC_0190
NC_0200
NC_0260
NC_0210
NC_0220
NC_0280
NC_0320
NC_0330
NC_0290
NC_0310
NC_0300
NC_0340
NC_0230
NC_0240
NC_0350
CREEK
O'HARES
Cliffs in this figure:
NC_0150 NC_0220 NC_0290
NC_0160 NC_0230 NC_0300
NC_0170 NC_0240 NC_0310
NC_0180 NC_0250 NC_0320
NC_0190 NC_0260 NC_0330
NC_0200 NC_0270 NC_0340
NC_0210 NC_0280 NC_0350
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 3
Version 1
Horizontal Datum
MGA - Zone 56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302000
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O'HARES CREEK
N
S
E
W
NC_0400
NC_0360
NC_0370
NC_0410
NC_0380
NC_0390
NC_0430
NC_0420
NC_0440
NC_0450
NC_0460
NC_0480
NC_0470
NC_0490
Cliffs in this figure:
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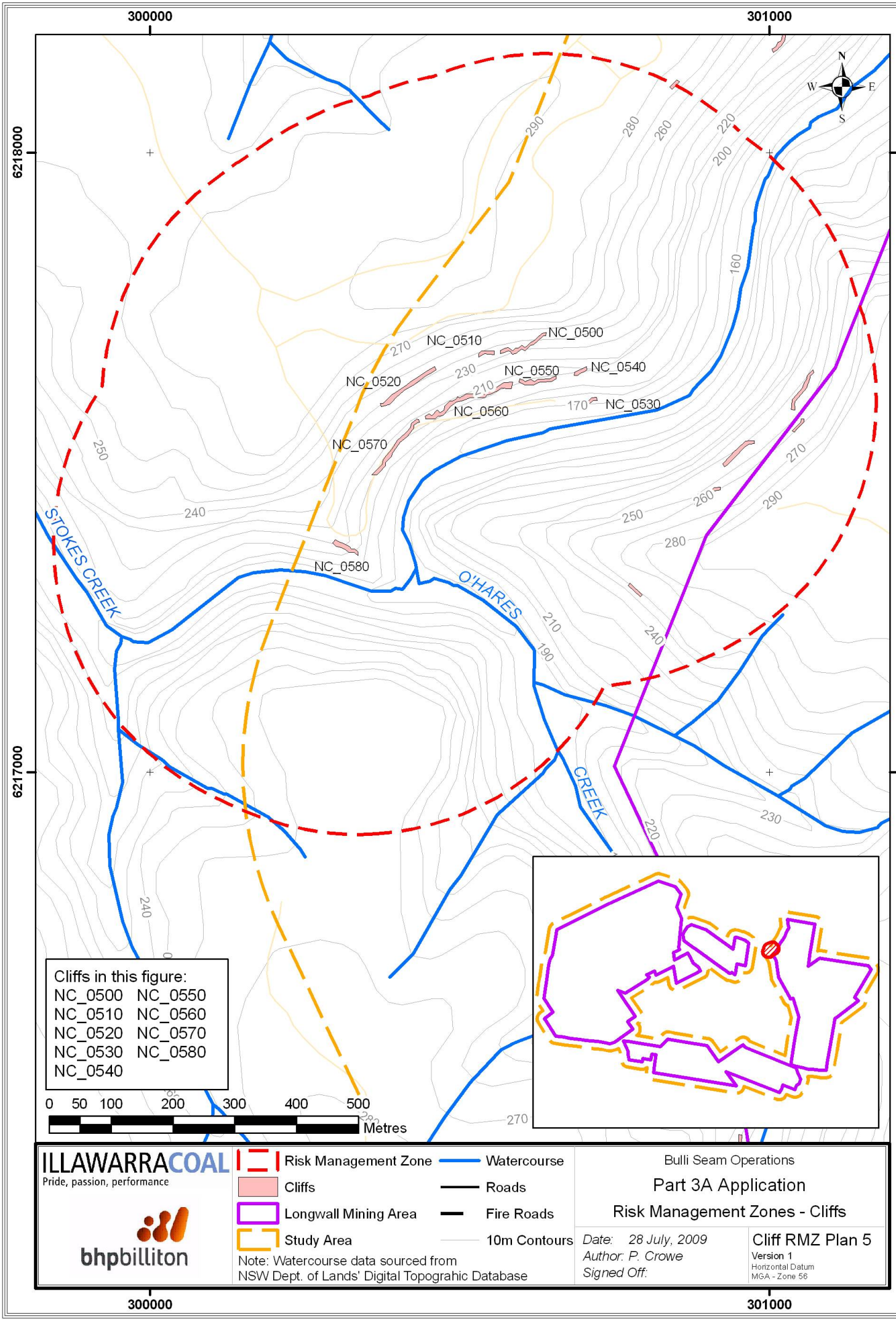
NC_0370 NC_0440
NC_0380 NC_0450
NC_0390 NC_0460
NC_0400 NC_0470
NC_0410 NC_0480
NC_0420 NC_0490
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 4
Version 1
Horizontal Datum
MGA - Zone 56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W
E
S
NC_0500
NC_0510
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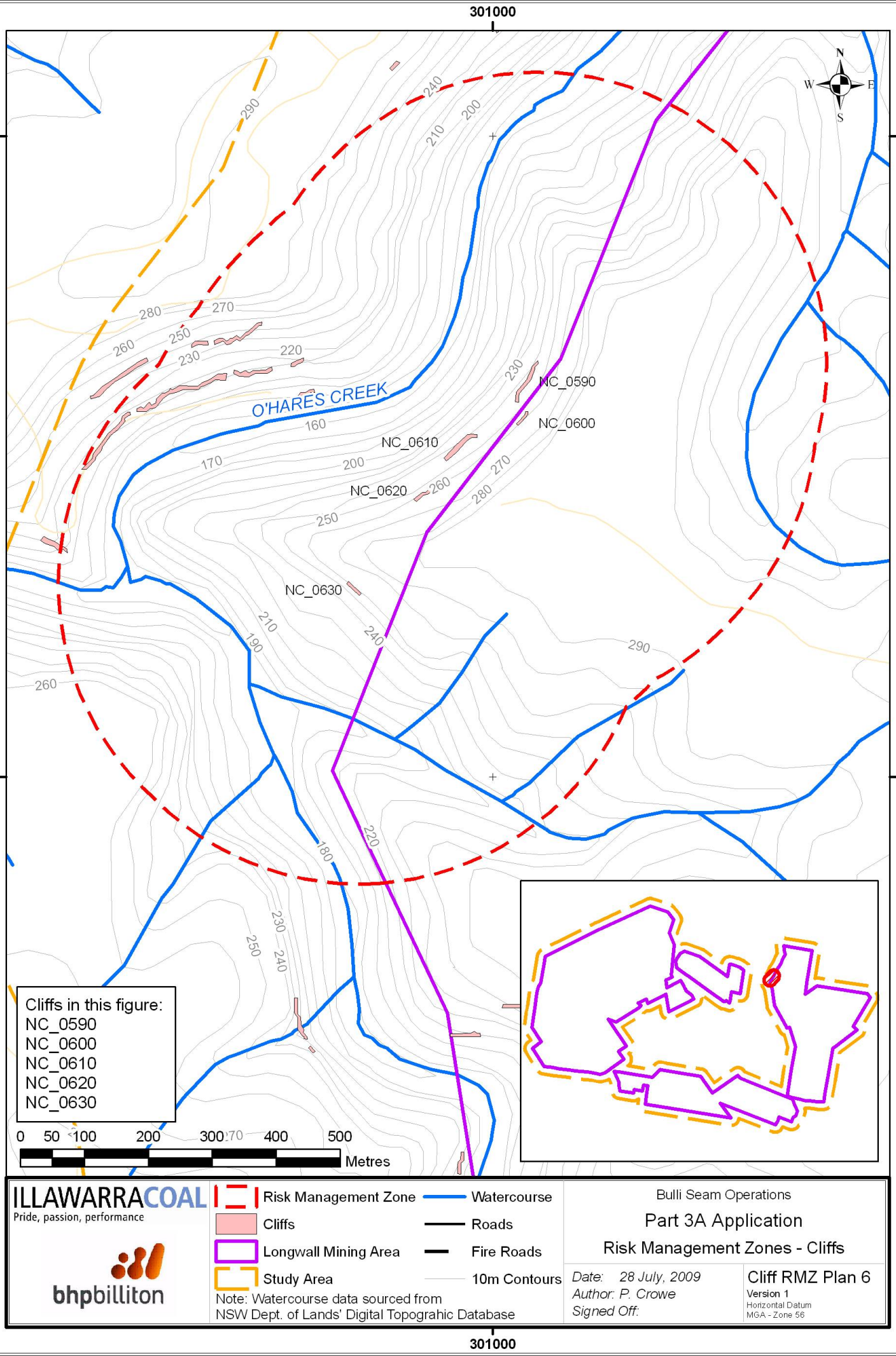
NC_0530
NC_0540
NC_0550
NC_0560
NC_0570
NC_0580
STOKES CREEK
O'HARES
CREEK
Cliffs in this figure:
NC_0500 NC_0550
NC_0510 NC_0560
NC_0520 NC_0570
NC_0530 NC_0580
NC_0540
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 5
Version 1
Horizontal Datum
MGA - Zone 56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6218000
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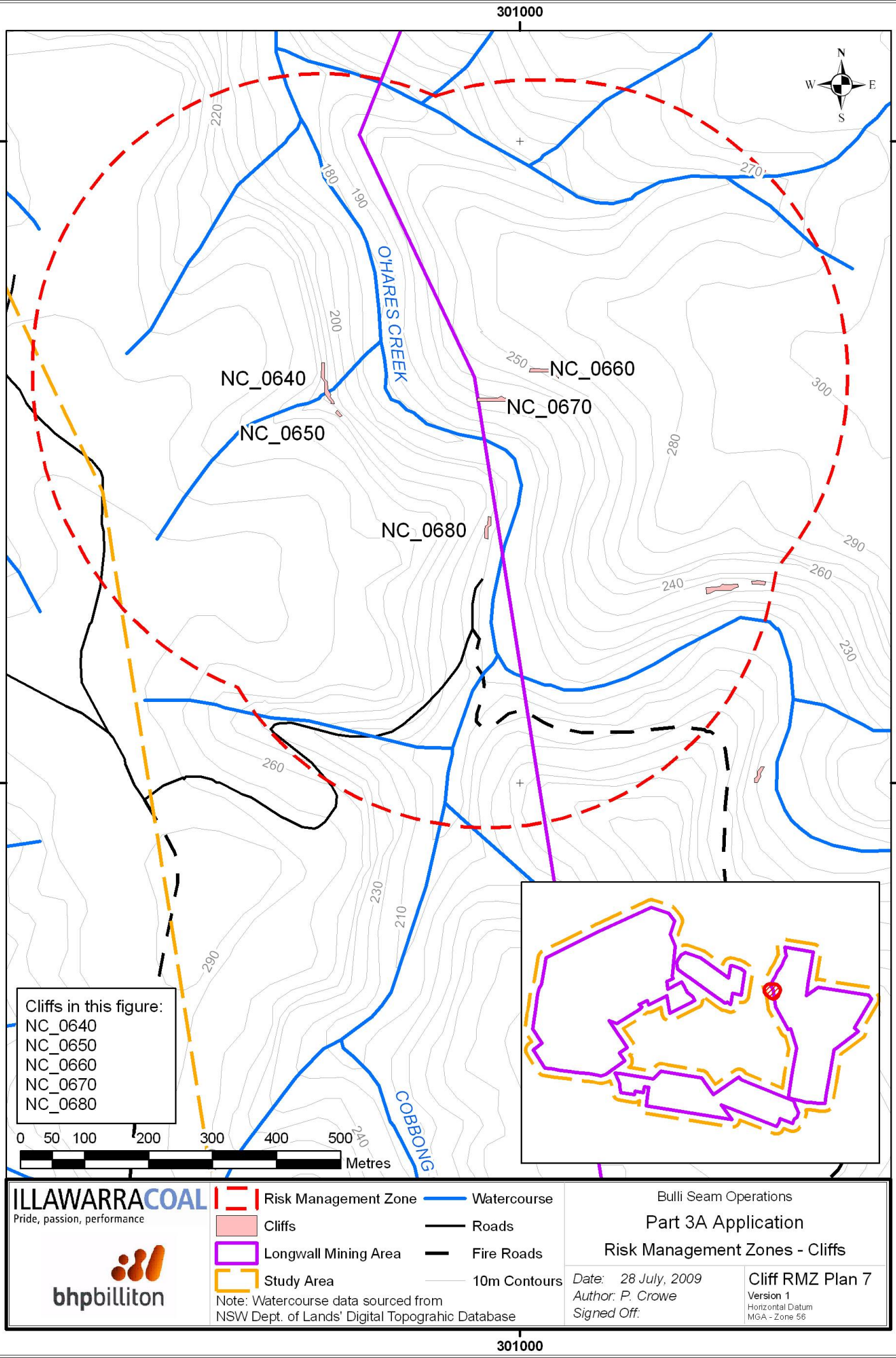
N
W
E
S
O'HARES CREEK
NC_0590
NC_0600
NC_0610
NC_0620
NC_0630
Cliffs in this figure:
NC_0590
NC_0600
NC_0610
NC_0620
NC_0630
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 6
Version 1
Horizontal Datum
MGA - Zone 56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S
O'HARES CREEK
COBBONG
NC_0640
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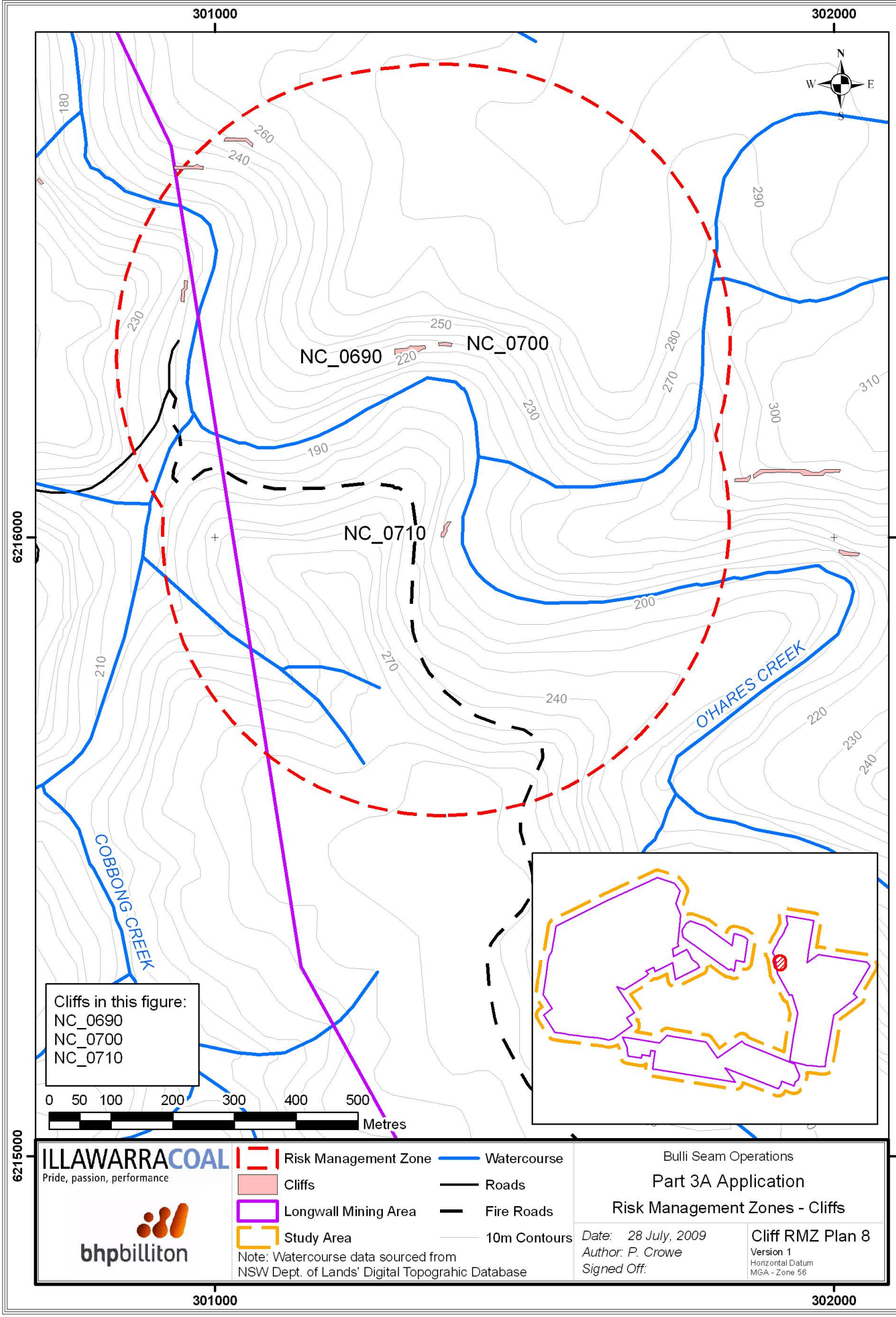
NC_0660
NC_0670
NC_0680
220
180
190
200
250
270
300
280
290
260
240
230
210
Cliffs in this figure:
NC_0640
NC_0650
NC_0660
NC_0670
NC_0680
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 7
Version 1
Horizontal Datum
MGA - Zone 56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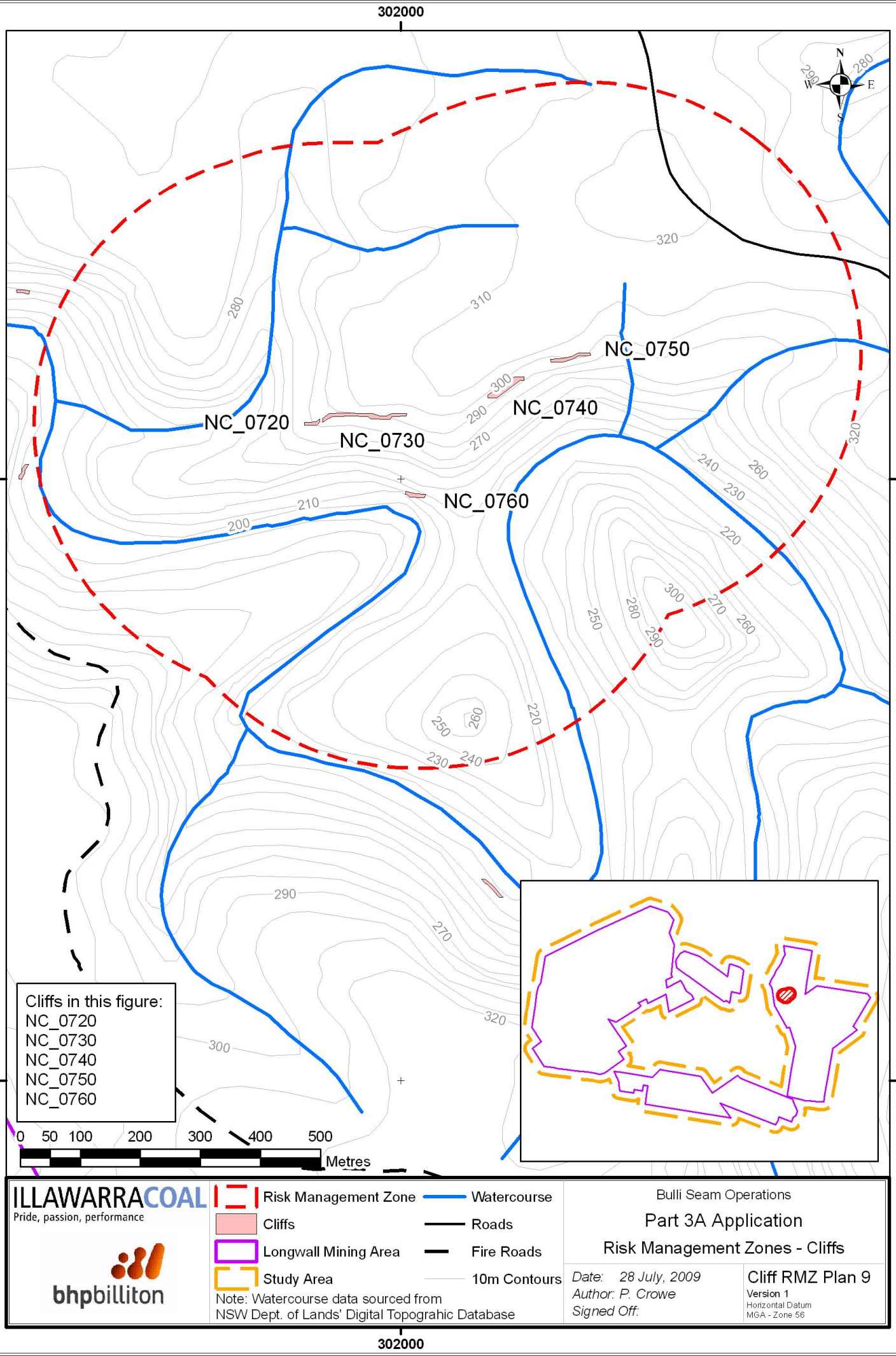
W
E
S
NC_0690
NC_0700
NC_0710
O'HARES CREEK
COBBONG CREEK
180
190
200
210
220
230
240
250
260
270
280
290
300
310
Cliffs in this figure:
NC_0690
NC_0700
NC_0710
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 8
Version 1
Horizontal Datum
MGA - Zone 56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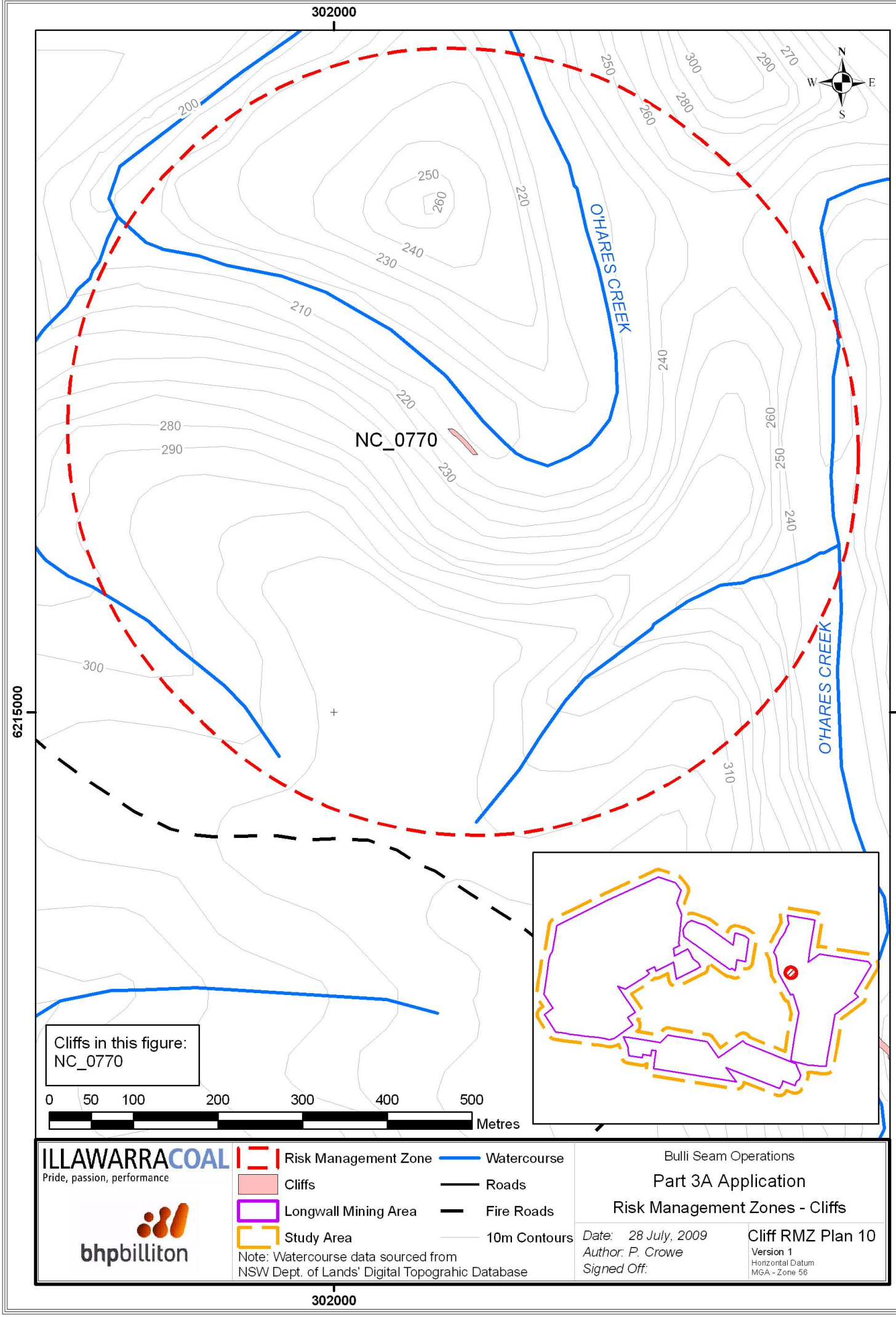
6216000
6215000
N
S
E
W
NC_0720
NC_0730
NC_0740
NC_0750
NC_0760
Cliffs in this figure:
NC_0720
NC_0730
NC_0740
NC_0750
NC_0760
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 9
Version 1
Horizontal Datum
MGA - Zone 56


302000
6215000
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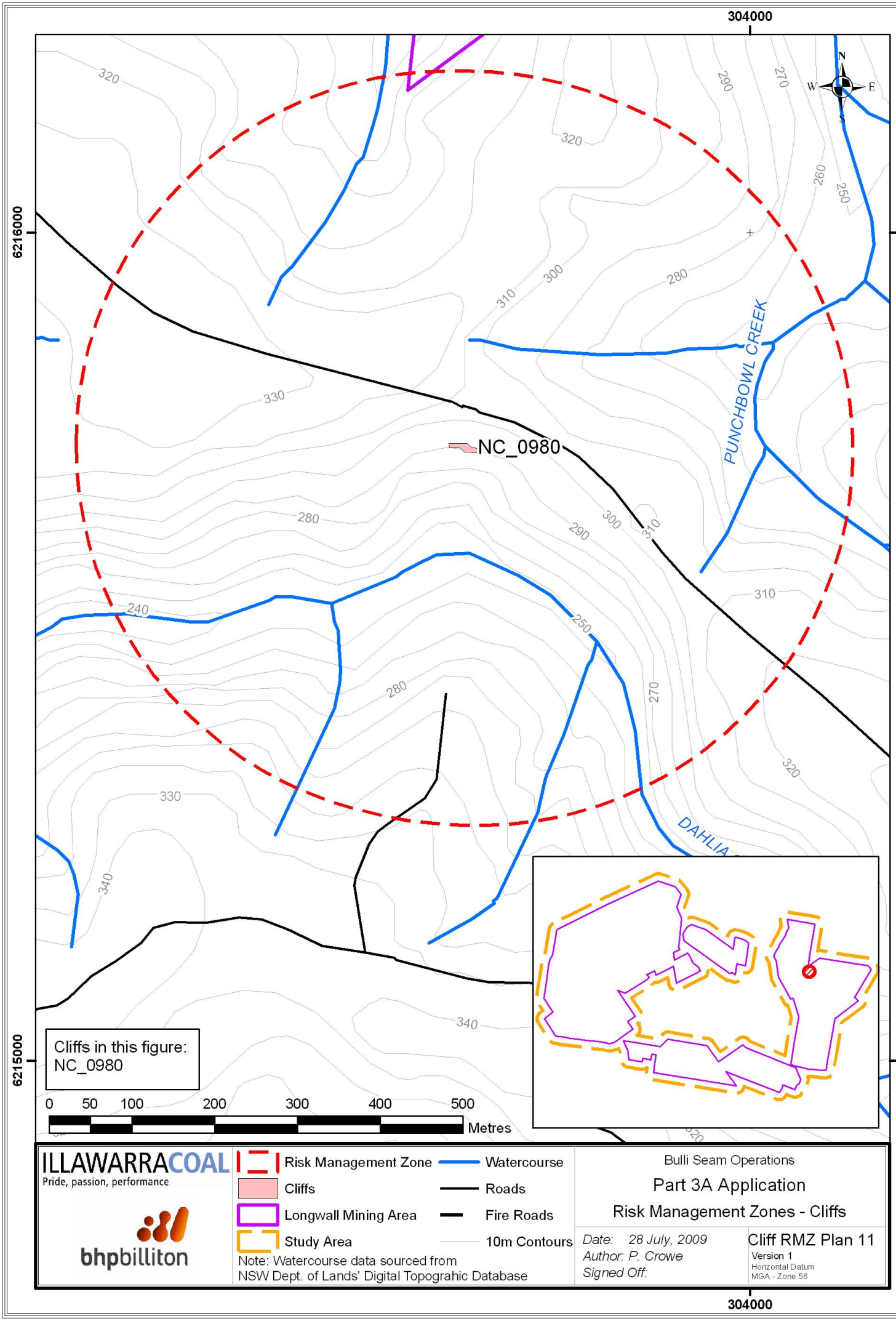
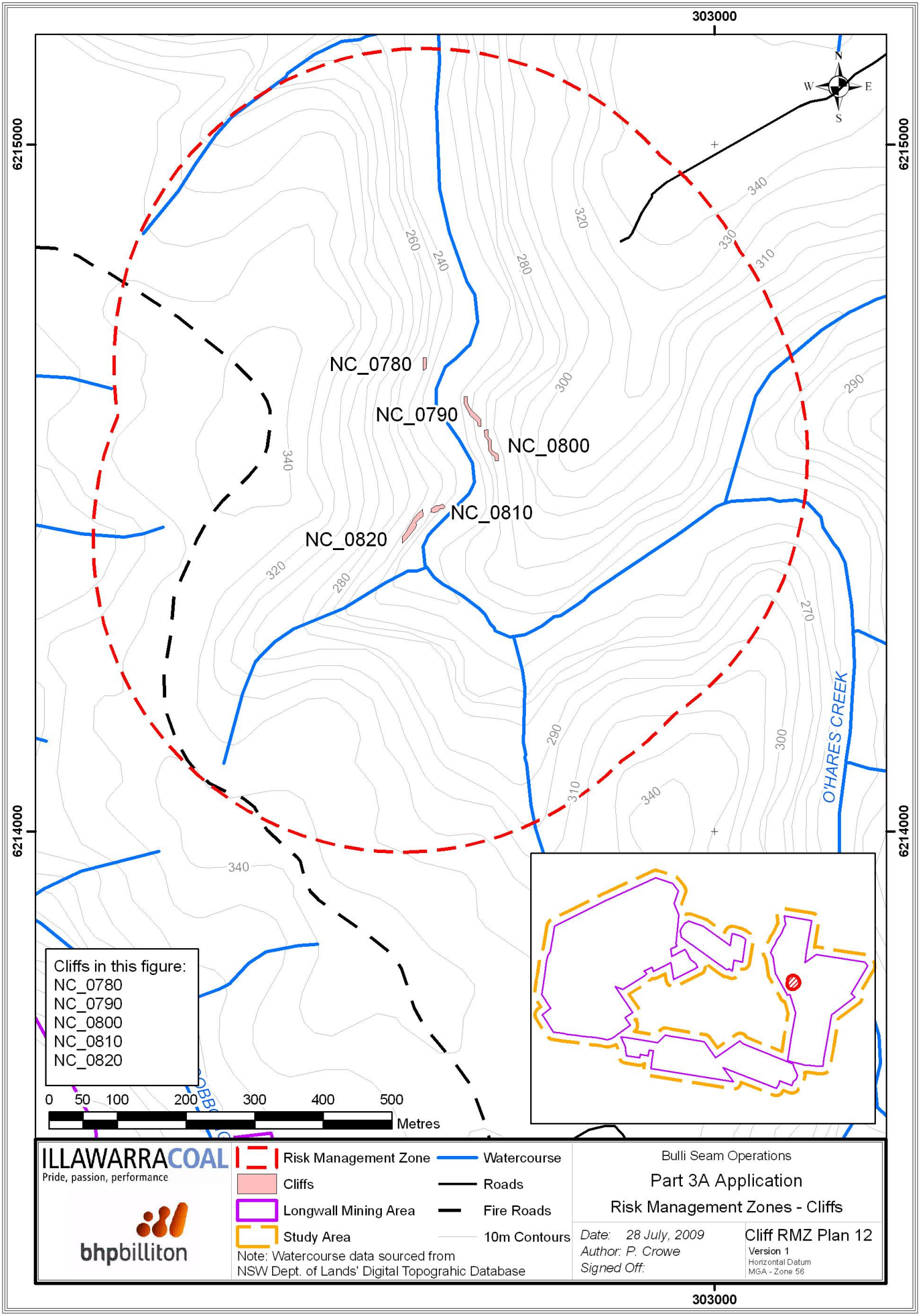
S
E
W
O'HARES CREEK
O'HARES CREEK
NC_0770
200
210
220
230
240
250
260
270
280
290
300
310
Cliffs in this figure:
NC_0770
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 10
Version 1
Horizontal Datum
MGA - Zone 56


304000
6216000
6215000
N
W
E
320
290
270
250
310
300
280
330
240
340
NC_0980
PUNCHBOWL CREEK
DAHLIA
Cliffs in this figure:
NC_0980
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 11
Version 1
Horizontal Datum
MGA - Zone 56


303000
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6214000
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W
E
S
NC_0780
NC_0790
NC_0800
NC_0810
NC_0820
O'HARES CREEK
Cliffs in this figure:
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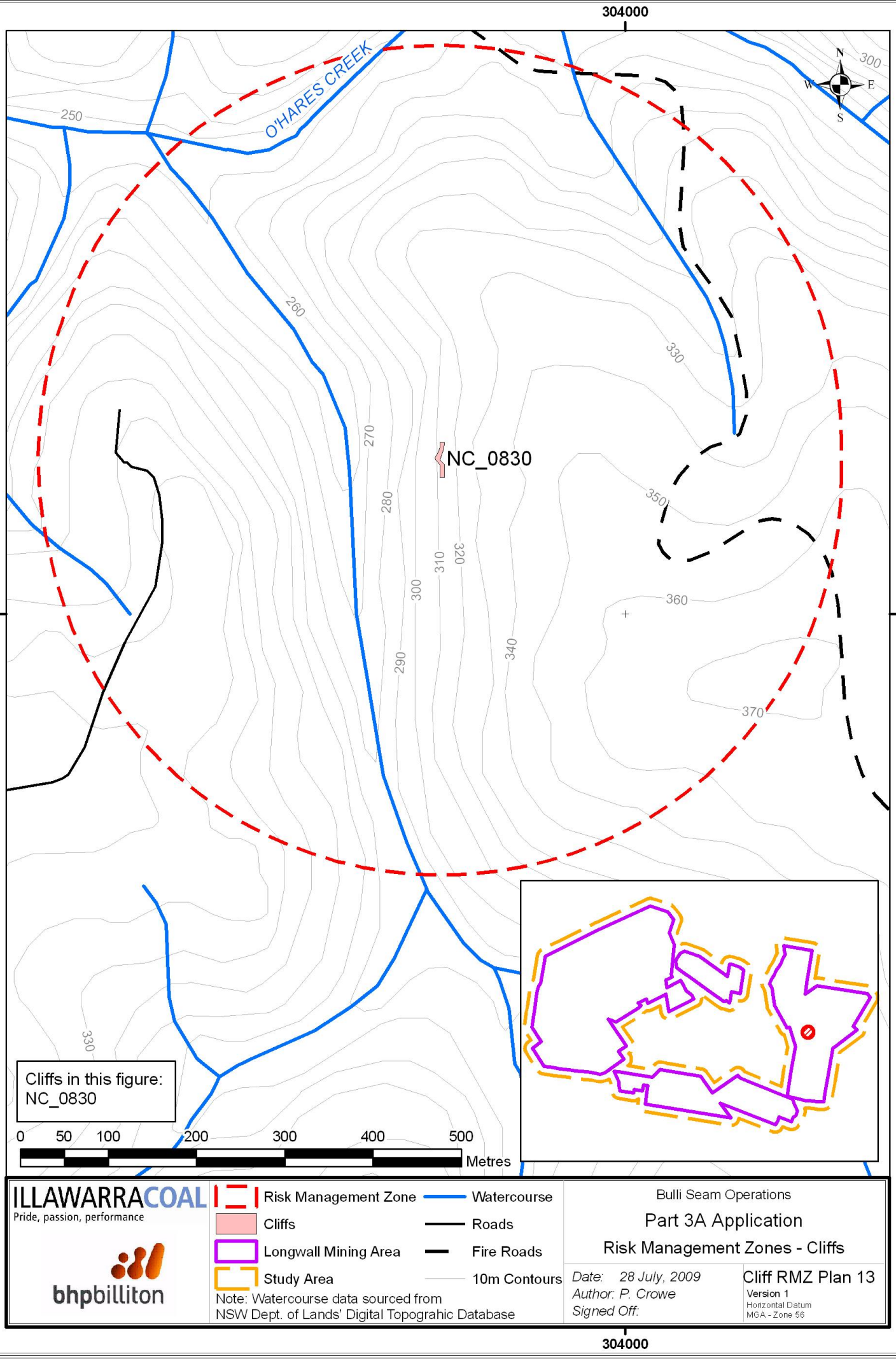
NC_0790
NC_0800
NC_0810
NC_0820
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 12
Version 1
Horizontal Datum
MGA - Zone 56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NC_0830
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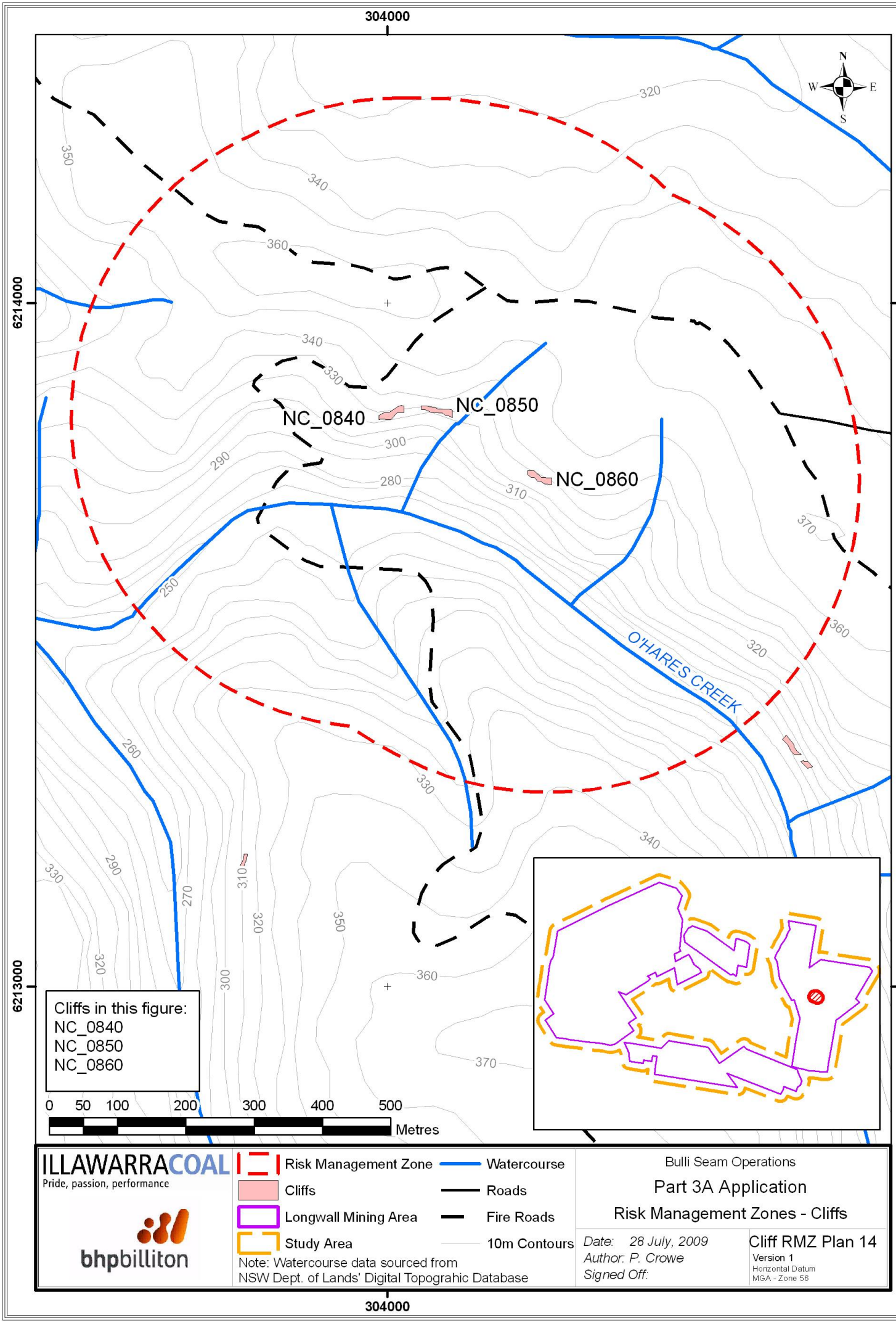
260
270
280
290
300
310
320
330
340
350
360
370
N
S
E
W
Cliffs in this figure:
NC_0830
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 13
Version 1
Horizontal Datum
MGA - Zone 56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6213000
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S
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NC_0850
NC_0860
O'HARES CREEK
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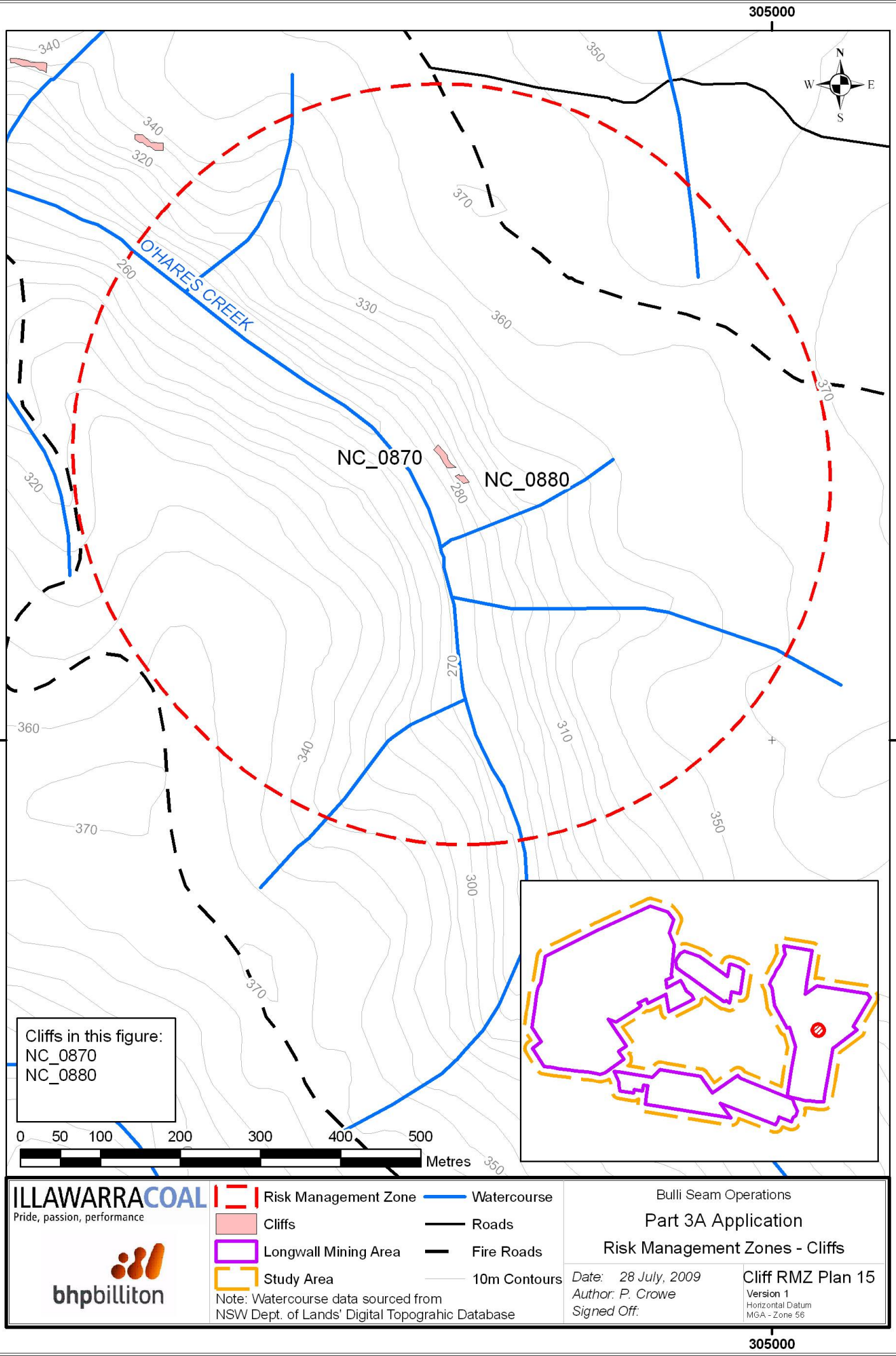
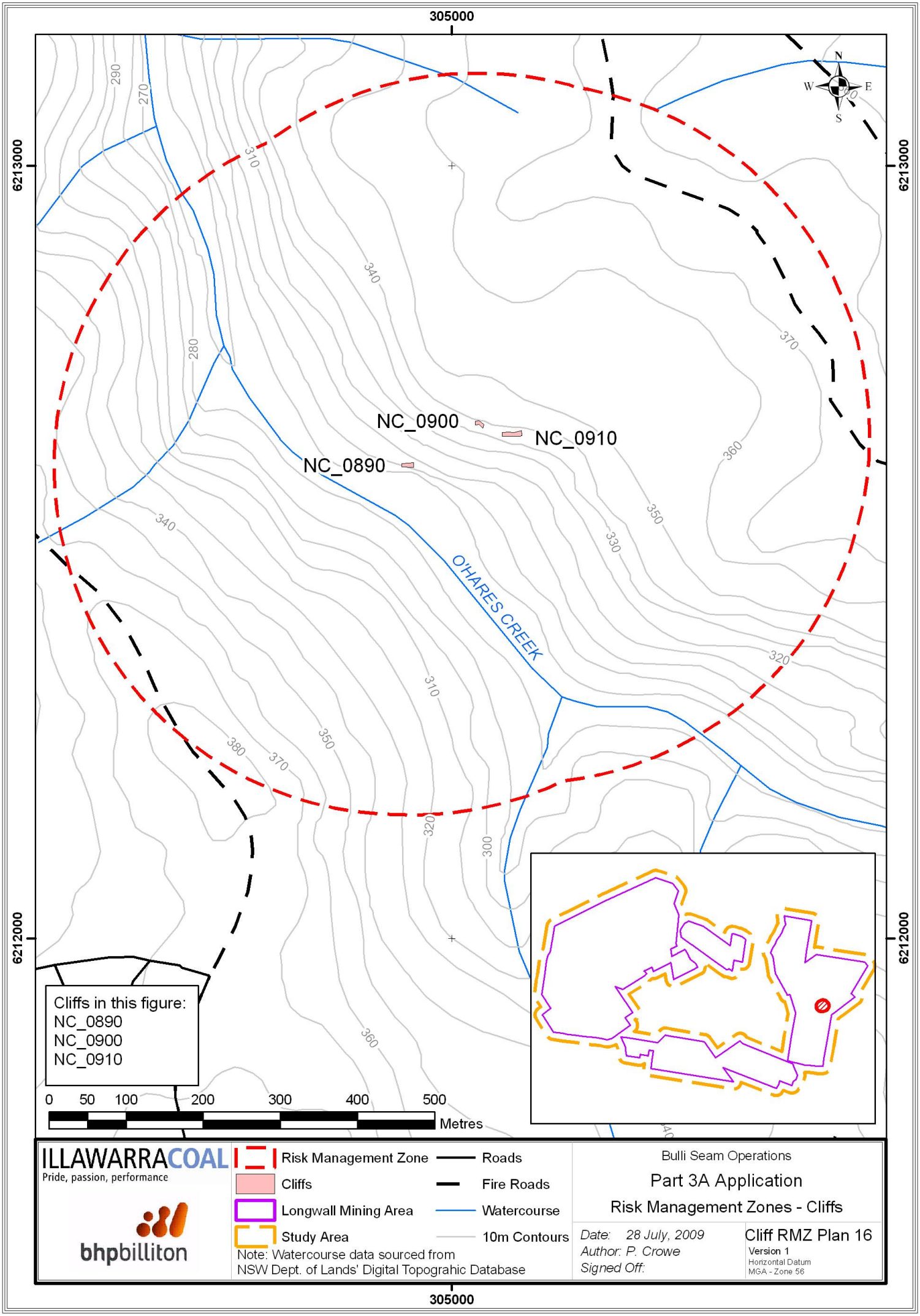
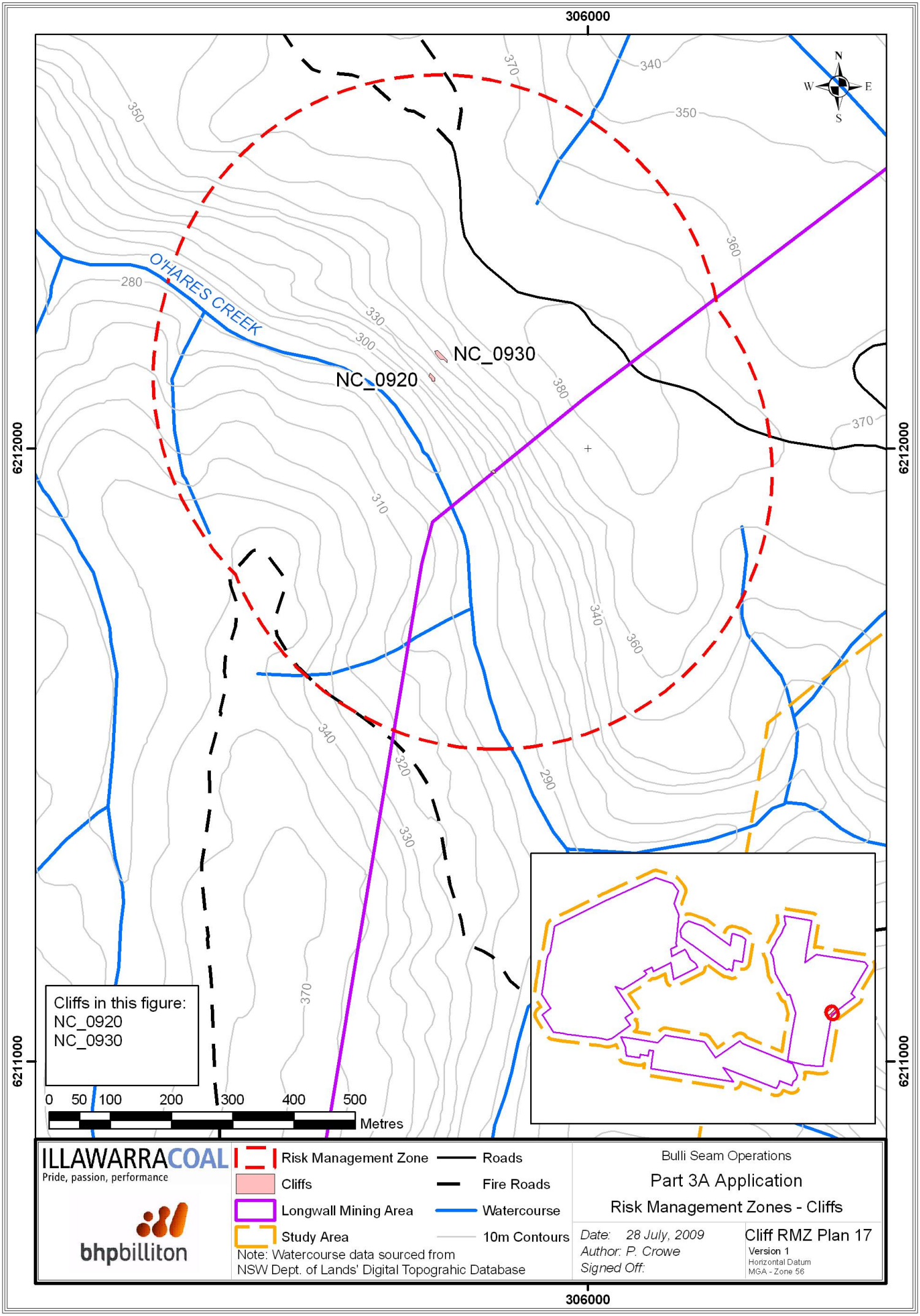
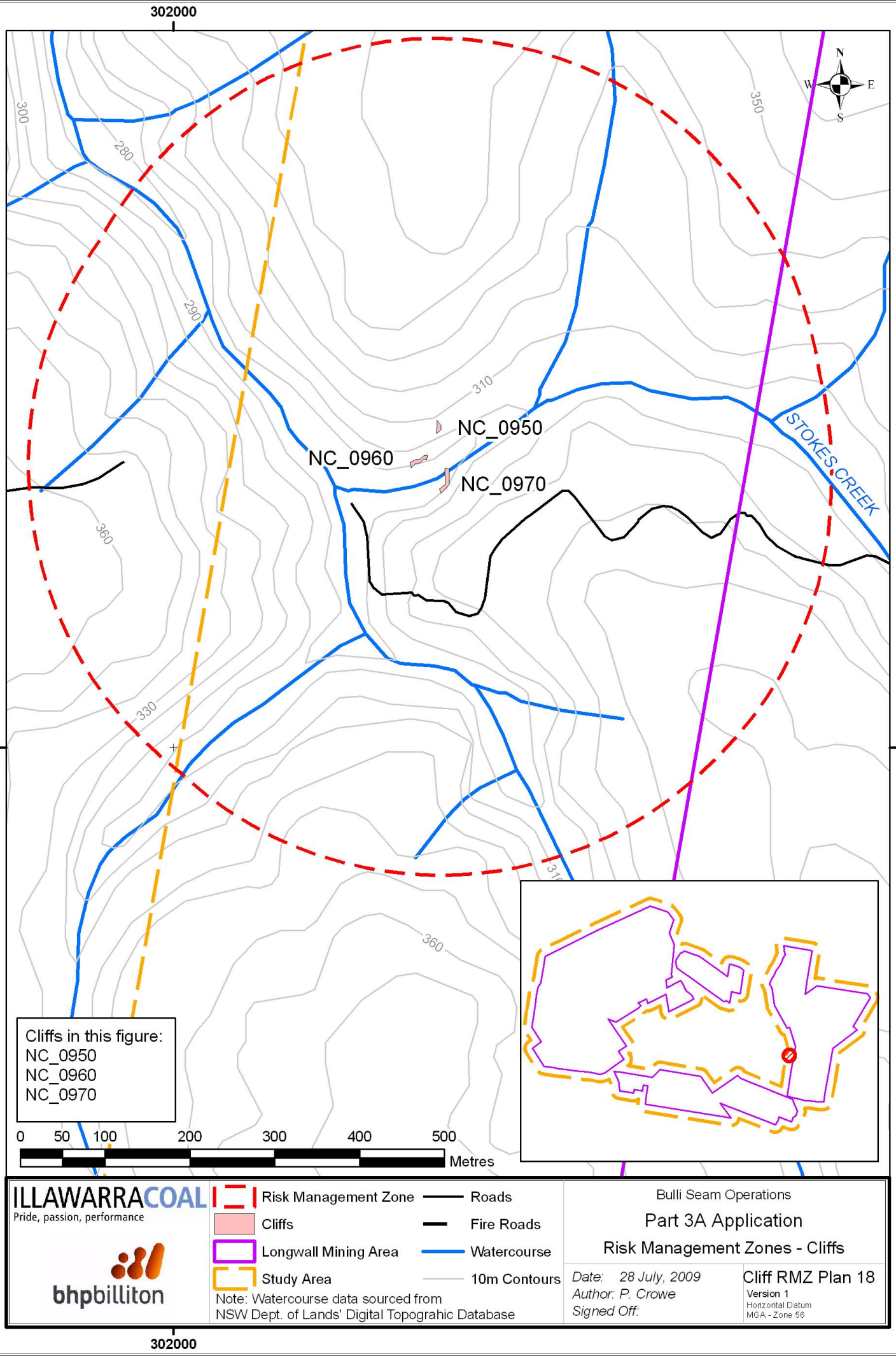
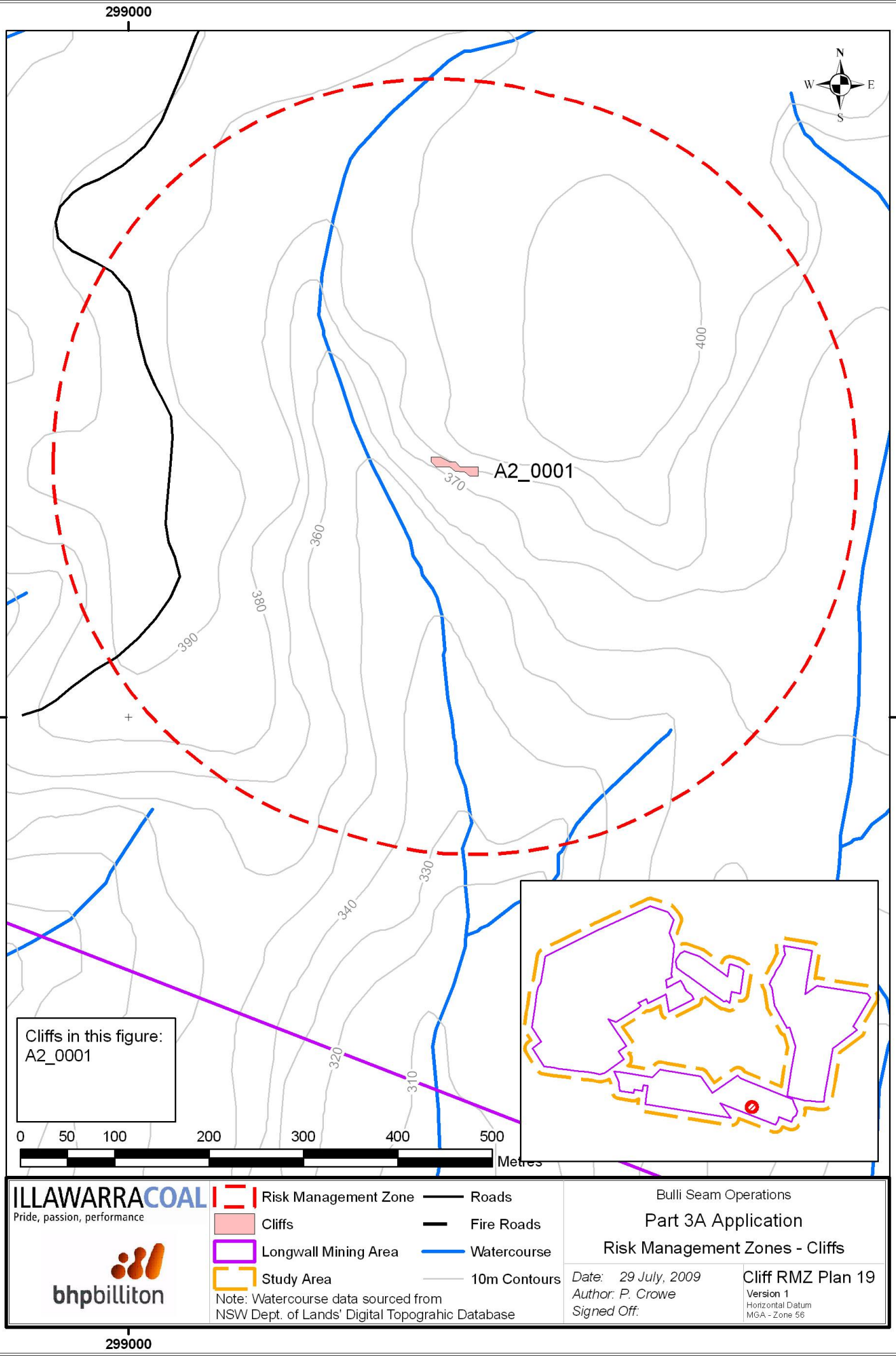
350
340
360
330
300
290
280
310
370
250
260
270
Cliffs in this figure:
NC_0840
NC_0850
NC_0860
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 14
Version 1
Horizontal Datum
MGA - Zone 56

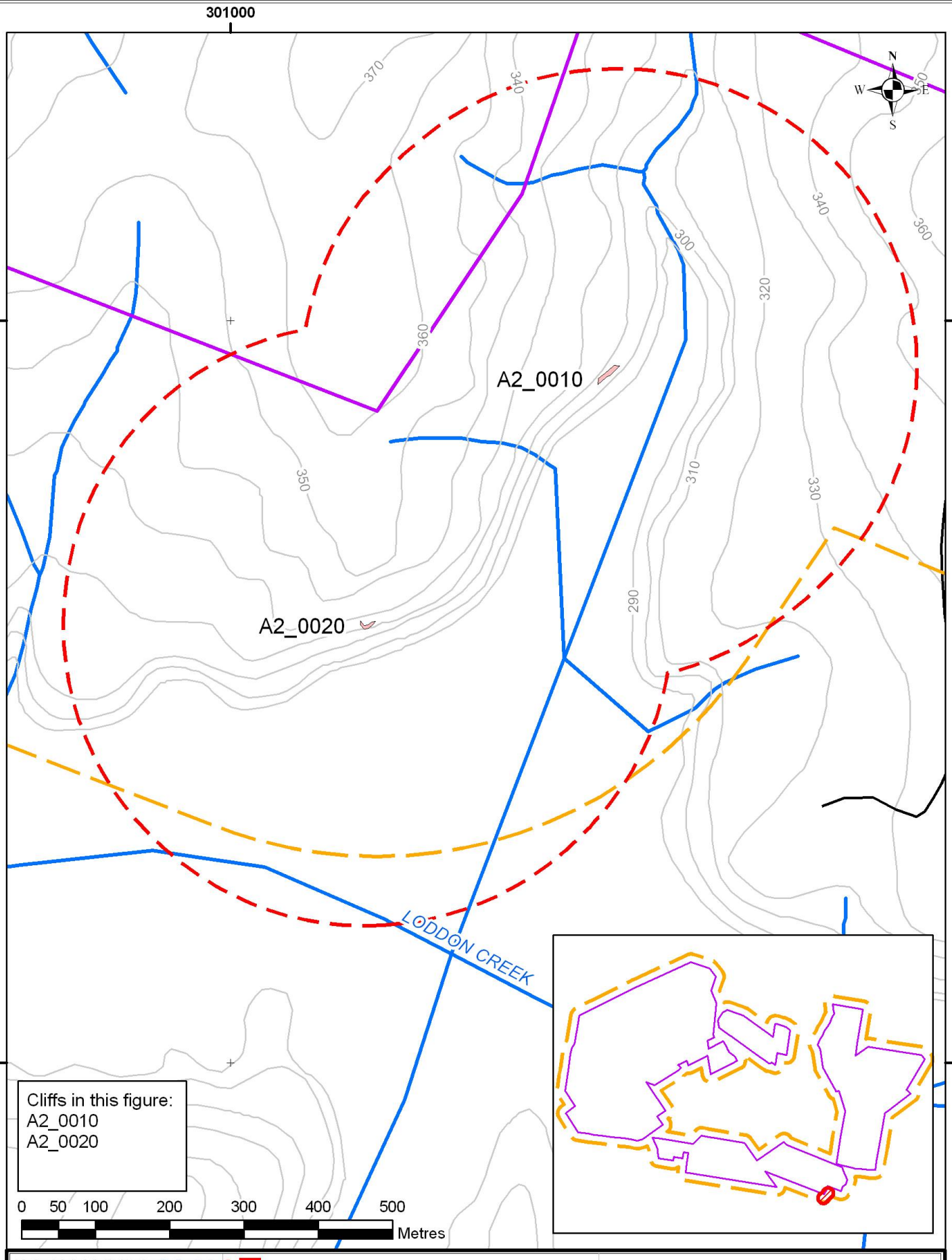

305000
6213000
N
W
E
S
O'HARES CREEK
NC_0870
NC_0880
340
350
320
370
260
330
360
280
270
310
300
Cliffs in this figure:
NC_0870
NC_0880
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Watercourse
Roads
Fire Roads
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 15
Version 1
Horizontal Datum
MGA - Zone 56


305000
6213000
6212000
N
S
E
W
NC_0900
NC_0910
NC_0890
O'HARES CREEK
Cliffs in this figure:
NC_0890
NC_0900
NC_0910
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 16
Version 1
Horizontal Datum
MGA - Zone 56


306000
6212000
6211000
N
S
E
W
O'HARES CREEK
NC_0930
NC_0920
370
340
350
360
280
330
300
380
310
290
320
Cliffs in this figure:
NC_0920
NC_0930
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 17
Version 1
Horizontal Datum
MGA - Zone 56


302000
6211000
N
W
E
S
300
280
290
310
350
360
330
NC_0950
NC_0960
NC_0970
STOKES CREEK
Cliffs in this figure:
NC_0950
NC_0960
NC_0970
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 28 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 18
Version 1
Horizontal Datum
MGA - Zone 56


299000
6207000
N
W
E
S
A2_0001
370
360
380
390
400
330
340
320
310
Cliffs in this figure:
A2_0001
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 19
Version 1
Horizontal Datum
MGA - Zone 56



ILLAWARRACOAL
Pride, passion, performance

bhpbilliton

Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours

Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database

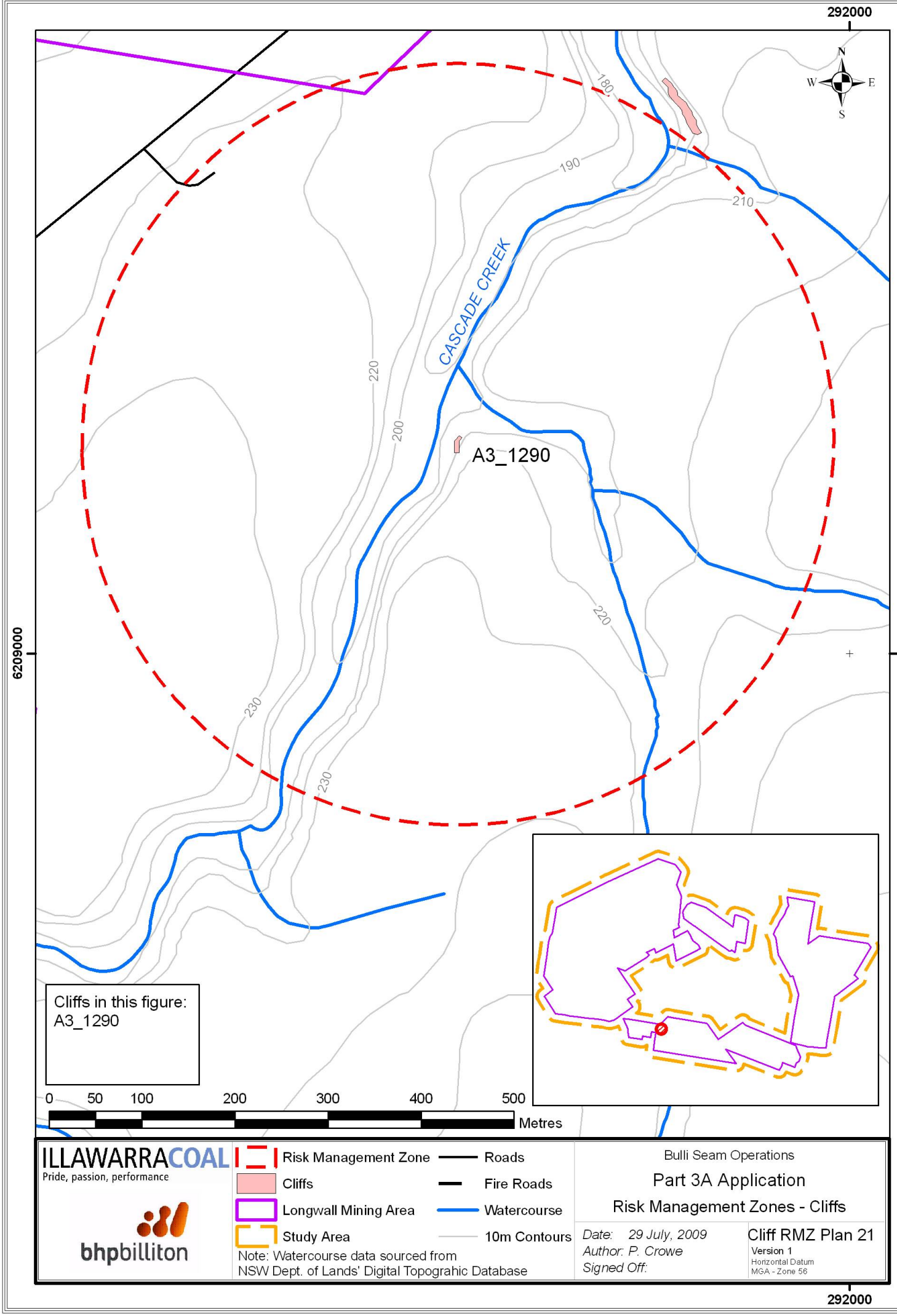
Bulli Seam Operations

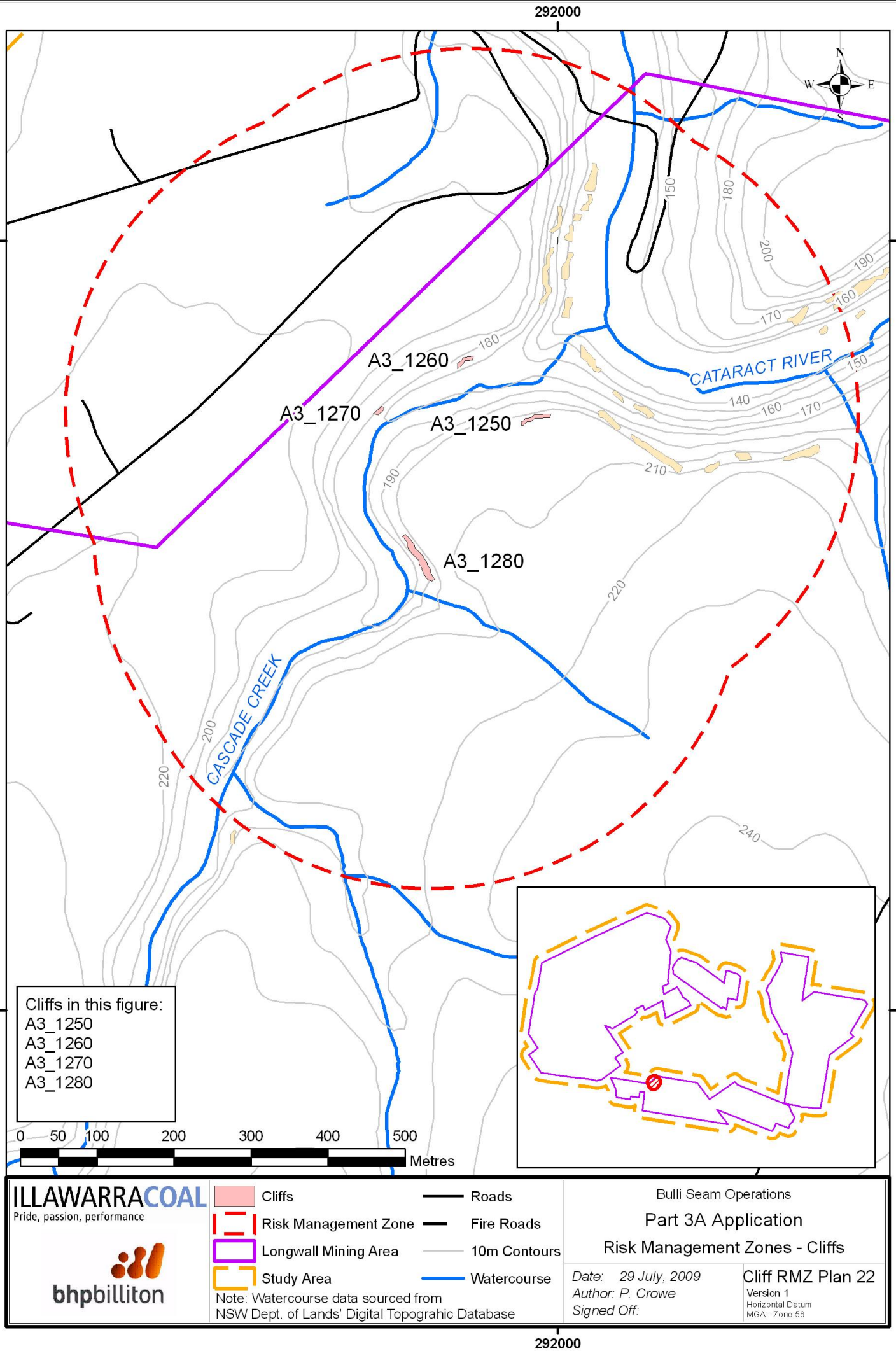
Part 3A Application

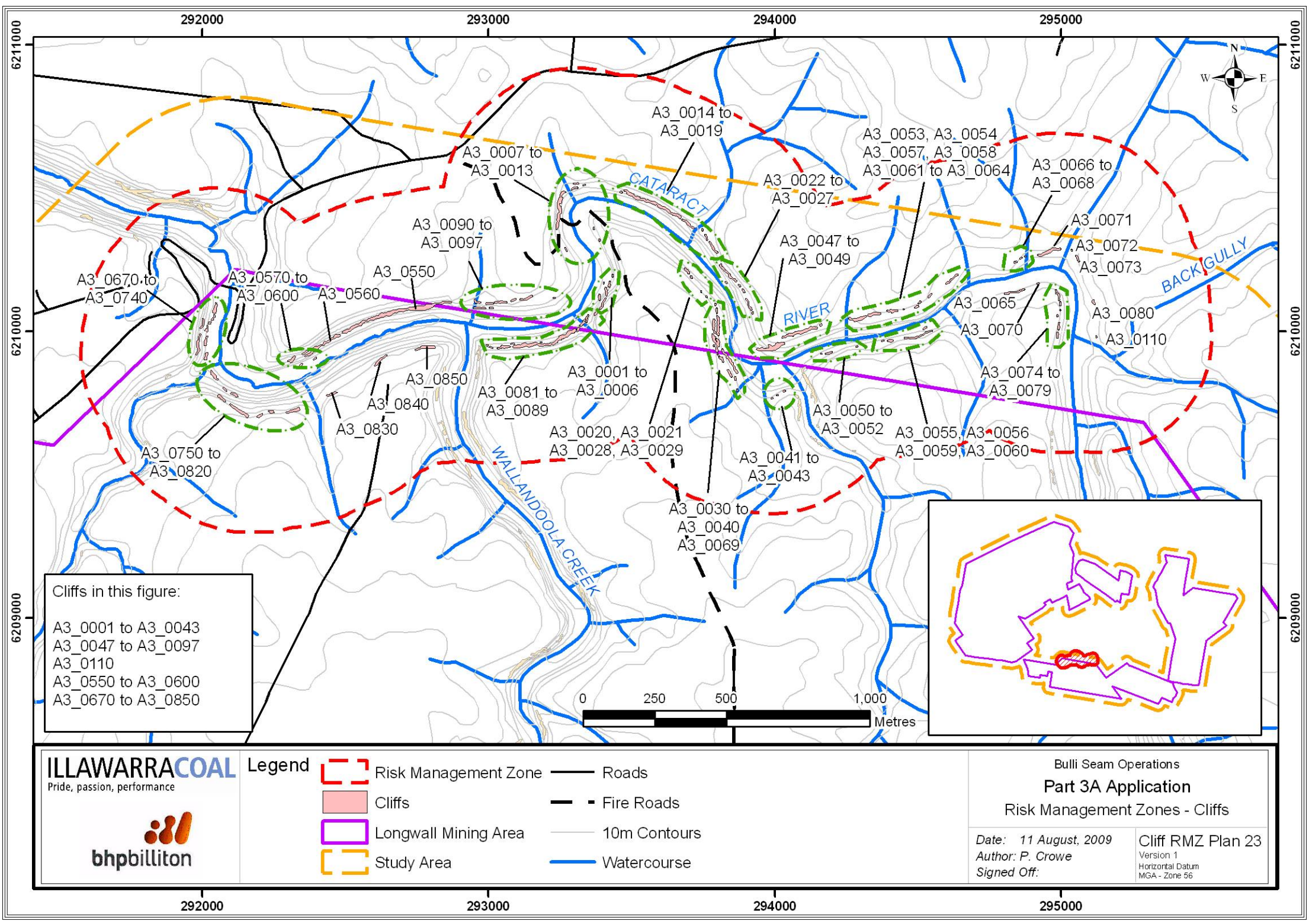
Risk Management Zones - Cliffs

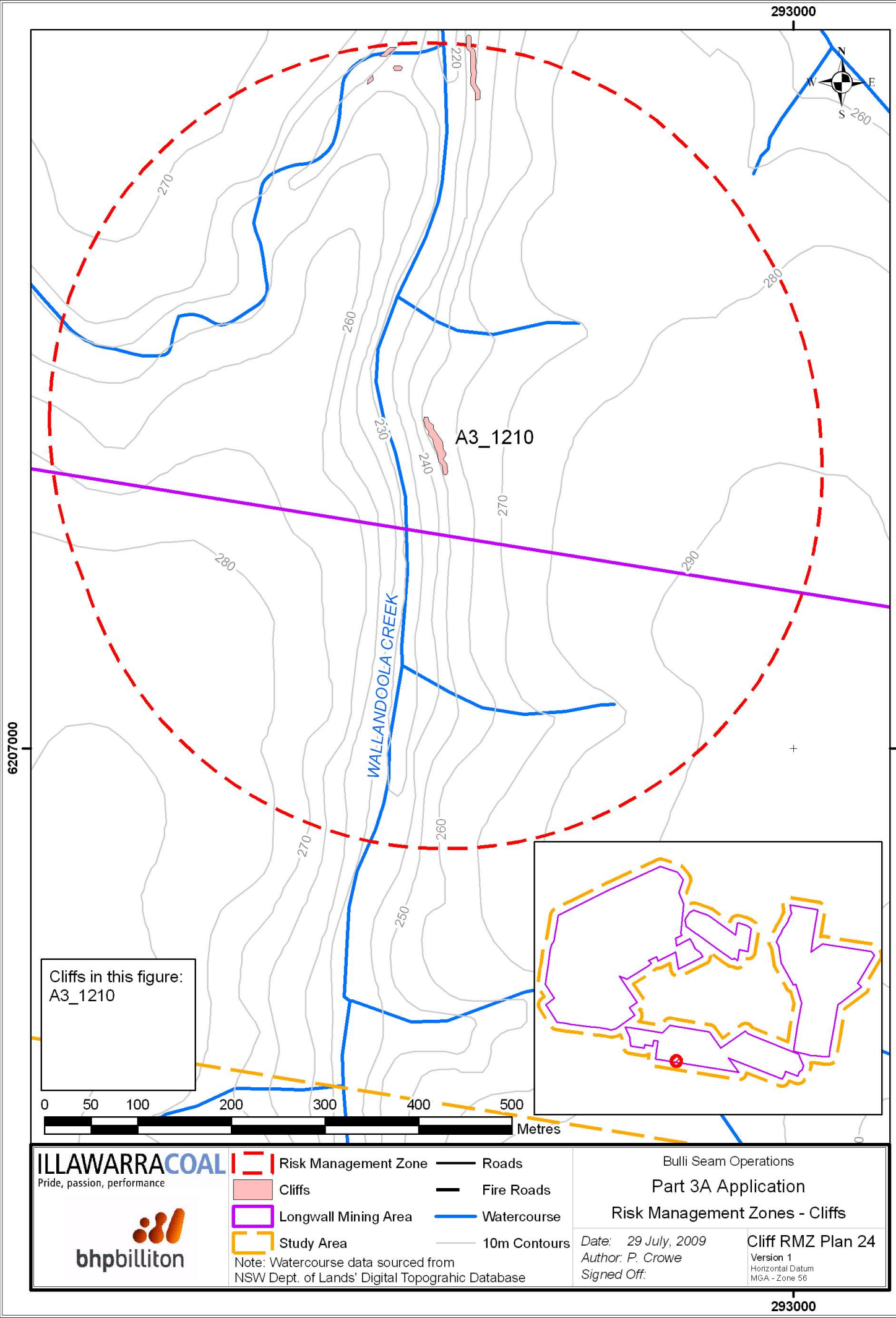
Date: 29 July, 2009
Author: P. Crowe
Signed Off:

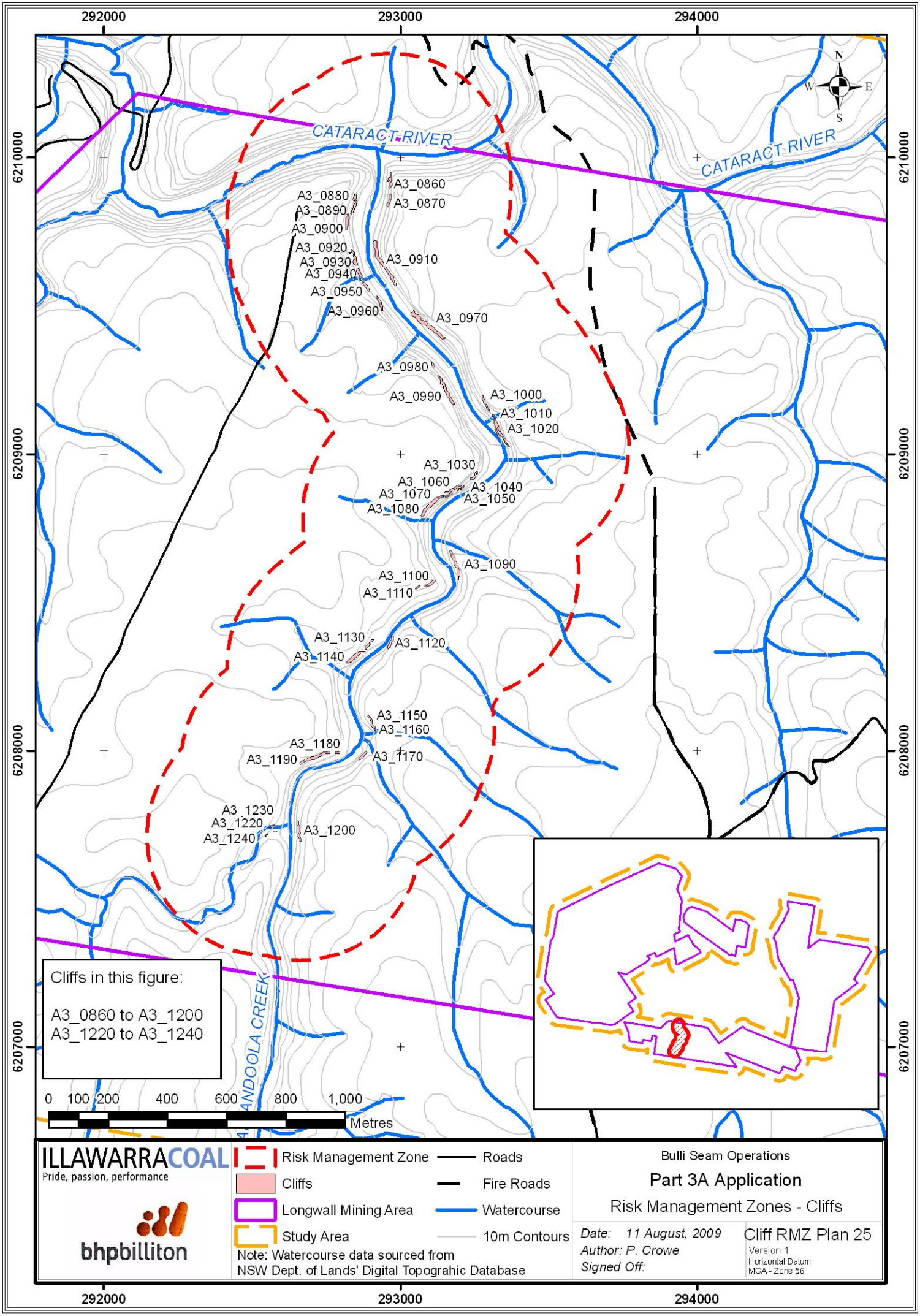
Cliff RMZ Plan 20
Version 1
Horizontal Datum
MGA - Zone 56

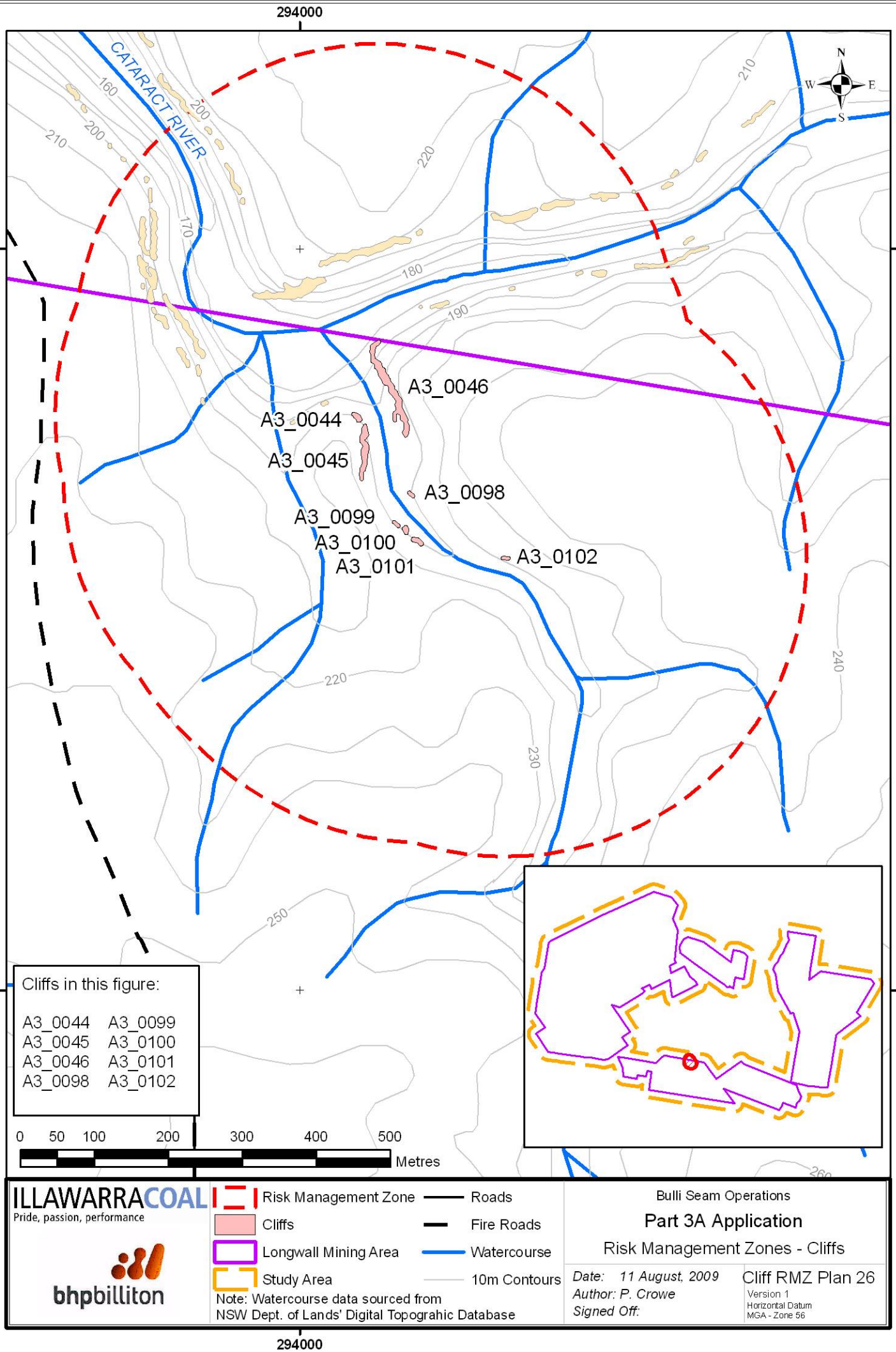

292000
6209000
N
W
E
S
180
190
210
220
200
230
CASCADE CREEK
A3_1290
Cliffs in this figure:
A3_1290
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 21
Version 1
Horizontal Datum
MGA - Zone 56

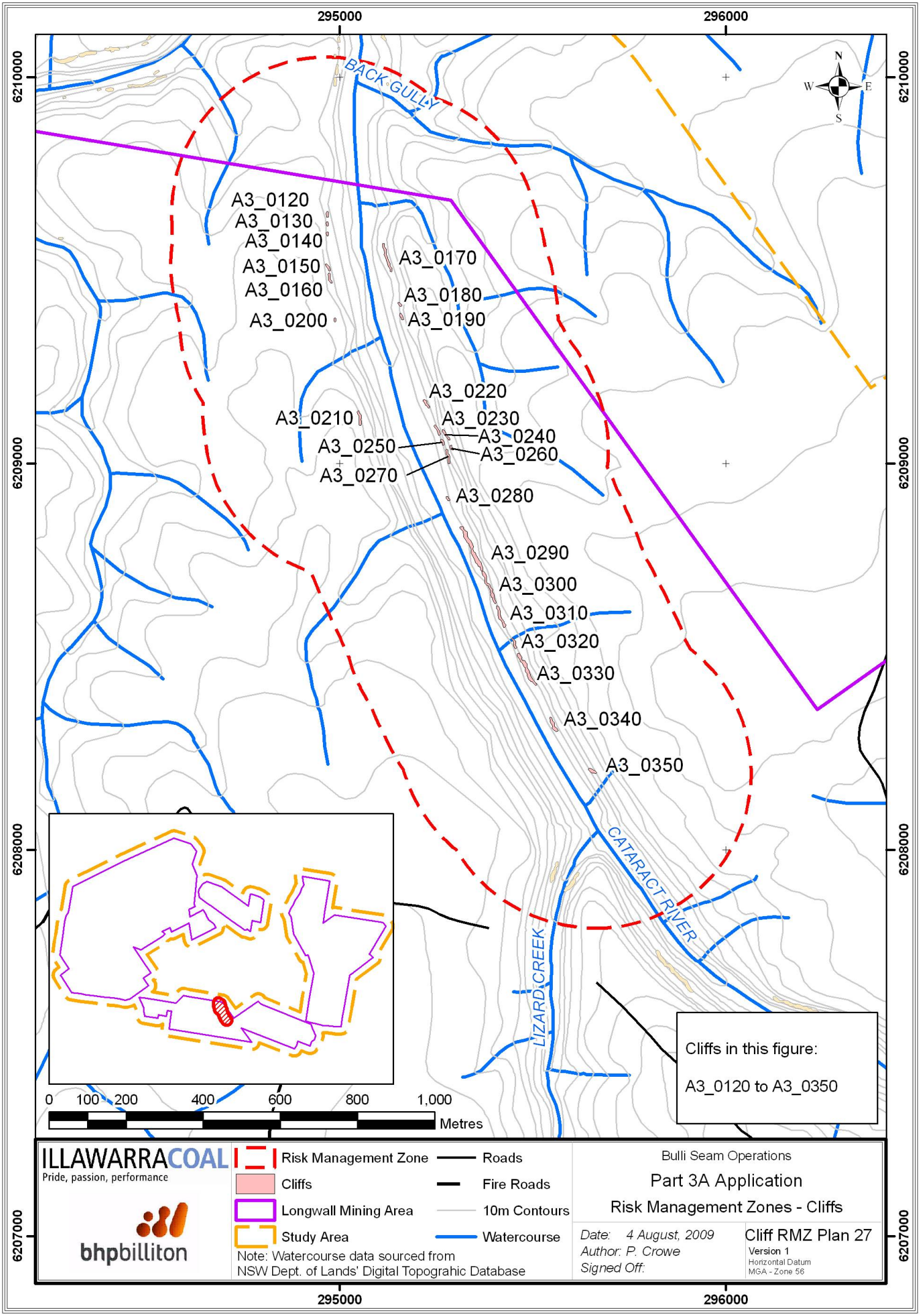

292000
6210000
6209000
N
W
E
S
A3_1260
A3_1270
A3_1250
A3_1280
CATARACT RIVER
CASCADE CREEK
150
180
200
190
160
170
140
210
220
240
Cliffs in this figure:
A3_1250
A3_1260
A3_1270
A3_1280
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Cliffs
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
10m Contours
Watercourse
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 22
Version 1
Horizontal Datum
MGA - Zone 56

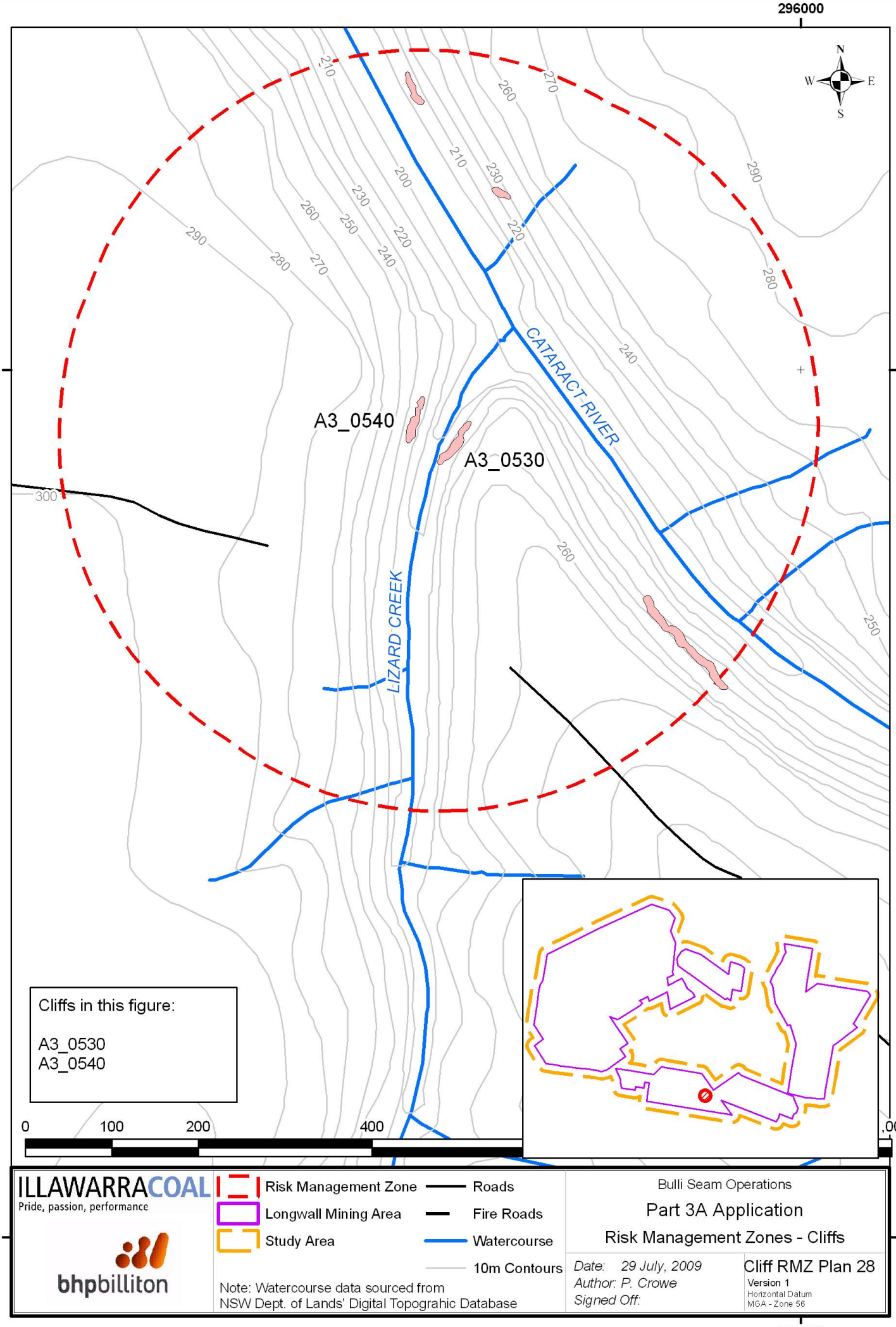

292000
293000
294000
295000
6211000
6210000
6209000
N
W
E
S
A3_0014 to
A3_0019
A3_0007 to
A3_0013
A3_0053, A3_0054
A3_0057, A3_0058
A3_0061 to A3_0064
A3_0066 to
A3_0068
A3_0022 to
A3_0027
CATARACT
A3_0090 to
A3_0097
A3_0071
A3_0072
A3_0073
A3_0047 to
A3_0049
BACK GULLY
A3_0670 to
A3_0740
A3_0570 to
A3_0600
A3_0550
A3_0560
RIVER
A3_0065
A3_0070
A3_0080
A3_0110
A3_0850
A3_0840
A3_0830
A3_0081 to
A3_0089
A3_0001 to
A3_0006
A3_0074 to
A3_0079
A3_0050 to
A3_0052
A3_0055, A3_0056
A3_0059, A3_0060
A3_0020, A3_0021
A3_0028, A3_0029
A3_0041 to
A3_0043
A3_0750 to
A3_0820
WALLANDOOLA CREEK
A3_0030 to
A3_0040
A3_0069
Cliffs in this figure:
A3_0001 to A3_0043
A3_0047 to A3_0097
A3_0110
A3_0550 to A3_0600
A3_0670 to A3_0850
0
250
500
1,000
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Legend
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
10m Contours
Watercourse
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 11 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 23
Version 1
Horizontal Datum
MGA - Zone 56

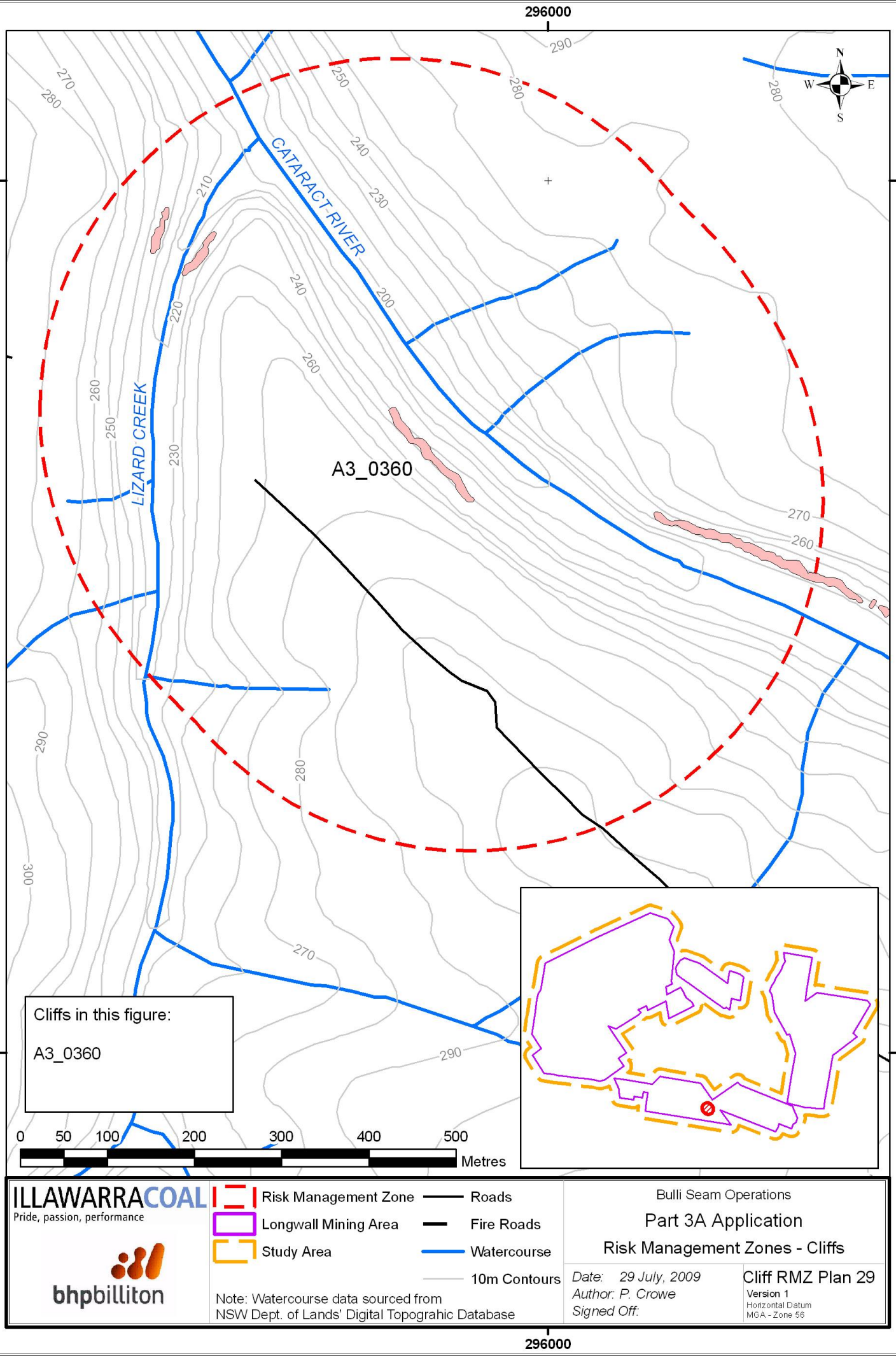

293000
6207000
N
W
E
S
220
260
270
280
290
230
240
A3_1210
WALLANDOOLA CREEK
250
Cliffs in this figure:
A3_1210
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 24
Version 1
Horizontal Datum
MGA - Zone 56

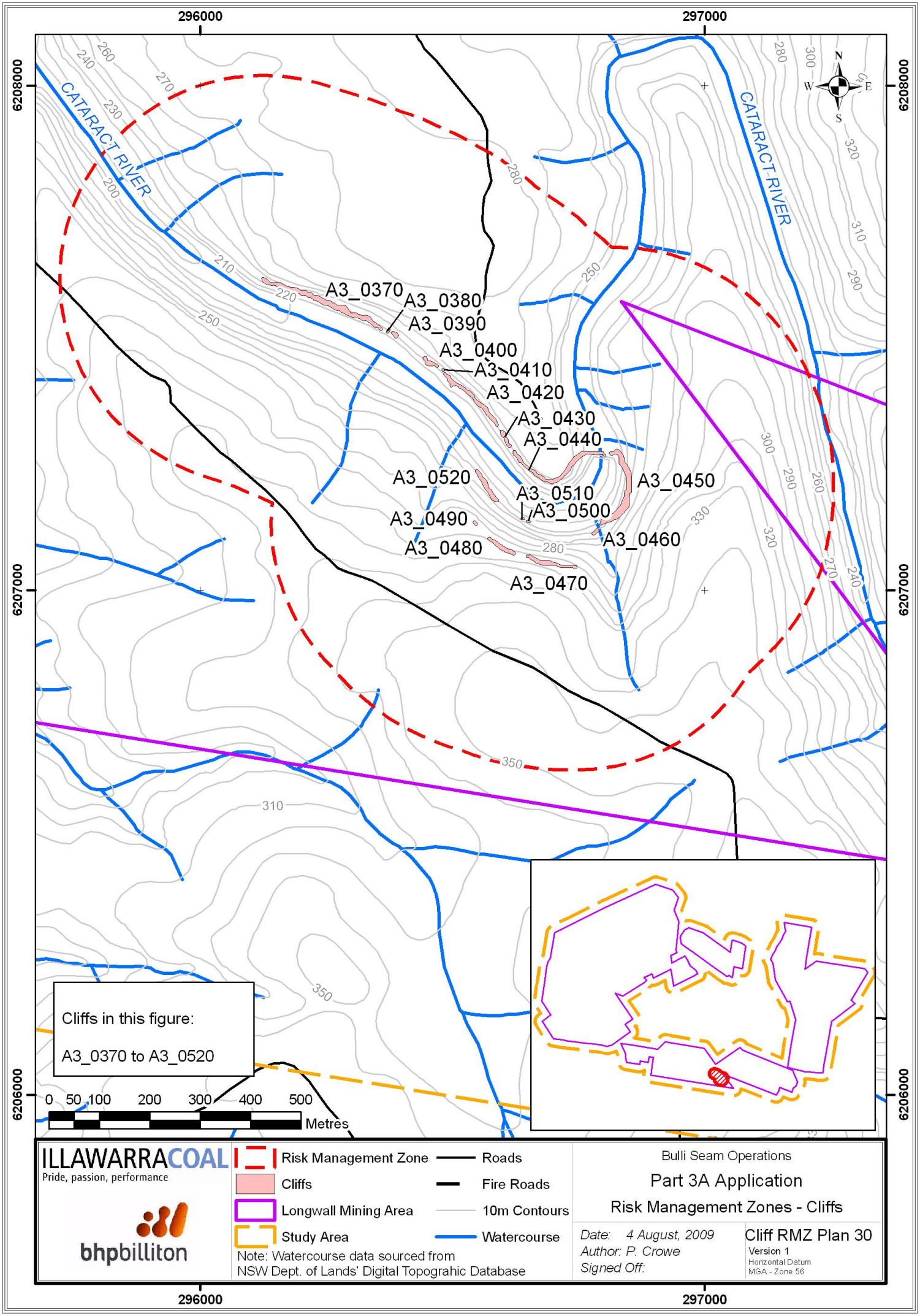

292000
293000
294000
6210000
6209000
6208000
6207000
CATARACT RIVER
CATARACT RIVER
N
W
E
S
A3_0860
A3_0870
A3_0880
A3_0890
A3_0900
A3_0910
A3_0920
A3_0930
A3_0940
A3_0950
A3_0960
A3_0970
A3_0980
A3_0990
A3_1000
A3_1010
A3_1020
A3_1030
A3_1040
A3_1050
A3_1060
A3_1070
A3_1080
A3_1090
A3_1100
A3_1110
A3_1120
A3_1130
A3_1140
A3_1150
A3_1160
A3_1170
A3_1180
A3_1190
A3_1200
A3_1220
A3_1230
A3_1240
Cliffs in this figure:
A3_0860 to A3_1200
A3_1220 to A3_1240
0 100 200 400 600 800 1,000
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 11 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 25
Version 1
Horizontal Datum
MGA - Zone 56

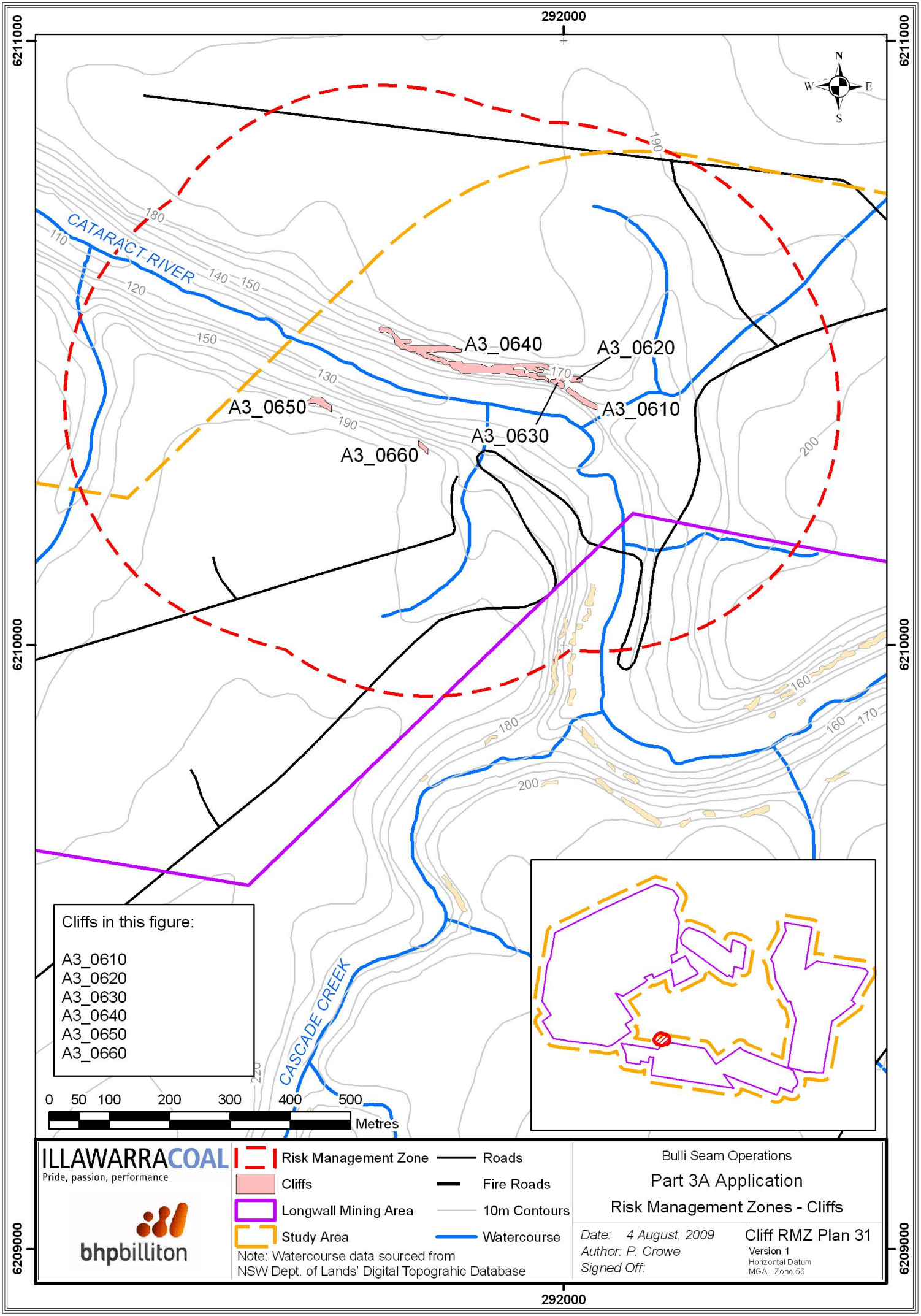

294000
6210000
6209000
CATARACT RIVER
160
170
180
190
200
210
220
230
240
250
260
N
S
E
W
A3_0046
A3_0044
A3_0045
A3_0098
A3_0099
A3_0100
A3_0101
A3_0102
Cliffs in this figure:
A3_0044
A3_0045
A3_0046
A3_0098
A3_0099
A3_0100
A3_0101
A3_0102
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 11 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 26
Version 1
Horizontal Datum
MGA - Zone 56


295000
296000
6210000
6209000
6208000
6207000
BACK GULLY
A3_0120
A3_0130
A3_0140
A3_0150
A3_0160
A3_0200
A3_0170
A3_0180
A3_0190
A3_0210
A3_0220
A3_0230
A3_0240
A3_0250
A3_0260
A3_0270
A3_0280
A3_0290
A3_0300
A3_0310
A3_0320
A3_0330
A3_0340
A3_0350
CATARACT RIVER
LIZARD CREEK
N
W
E
S
0 100 200 400 600 800 1,000
Metres
Cliffs in this figure:
A3_0120 to A3_0350
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
10m Contours
Watercourse
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 27
Version 1
Horizontal Datum
MGA - Zone 56


296000
6208000
6207000
N
W
E
S
210
260
270
200
230
290
220
240
250
280
300
A3_0540
A3_0530
CATARACT RIVER
LIZARD CREEK
Cliffs in this figure:
A3_0530
A3_0540
0
100
200
400
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 28
Version 1
Horizontal Datum
MGA - Zone 56


296000
6208000
6207000
CATARACT RIVER
LIZARD CREEK
A3_0360
N
S
E
W
Cliffs in this figure:
A3_0360
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 29
Version 1
Horizontal Datum
MGA - Zone 56


296000
297000
6208000
6207000
6206000
CATARACT RIVER
CATARACT RIVER
A3_0370
A3_0380
A3_0390
A3_0400
A3_0410
A3_0420
A3_0430
A3_0440
A3_0450
A3_0460
A3_0470
A3_0480
A3_0490
A3_0500
A3_0510
A3_0520
Cliffs in this figure:
A3_0370 to A3_0520
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
10m Contours
Watercourse
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 30
Version 1
Horizontal Datum
MGA - Zone 56



ILLAWARRACOAL
Pride, passion, performance

bhpbilliton

Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
10m Contours
Watercourse

Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database

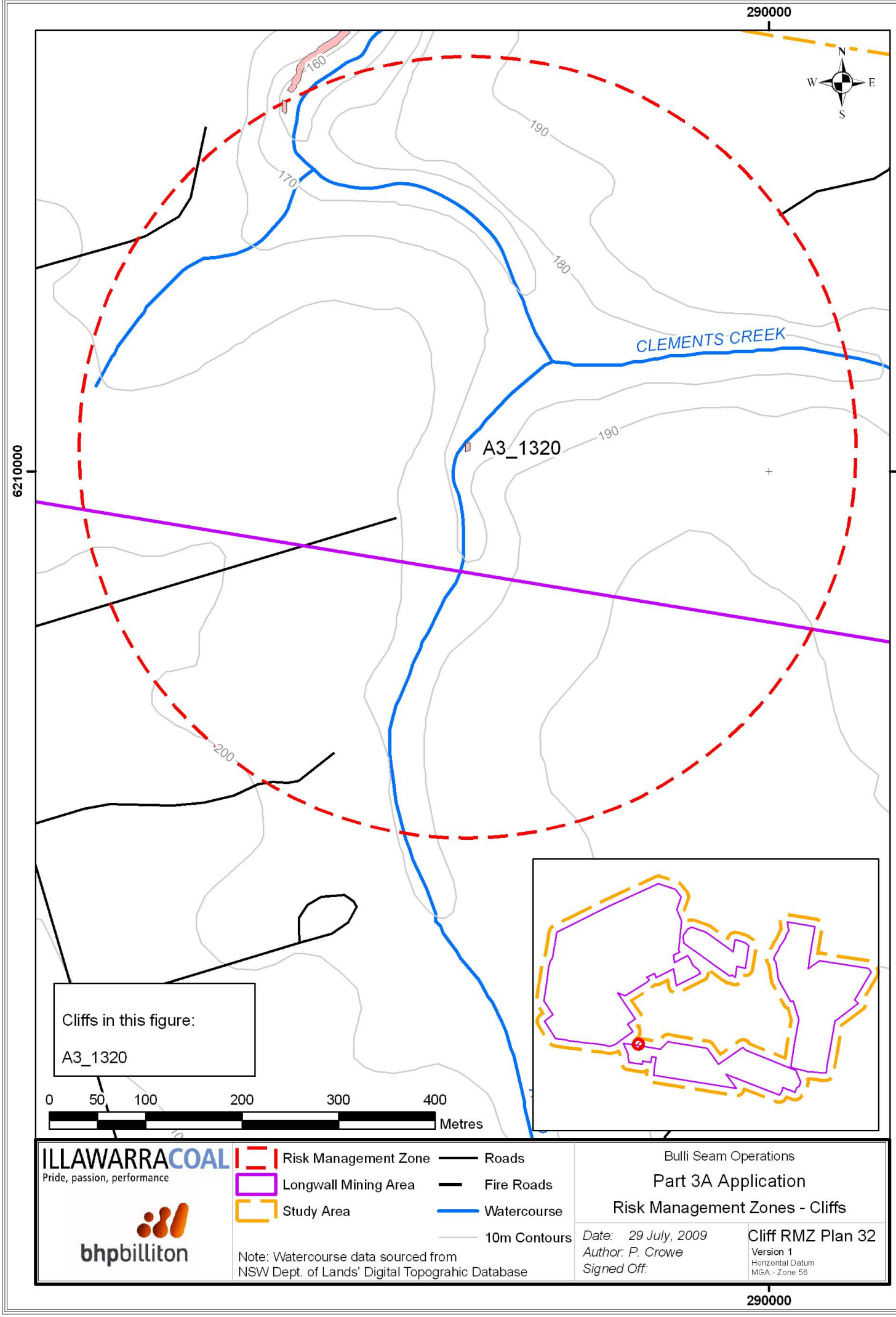
Bulli Seam Operations

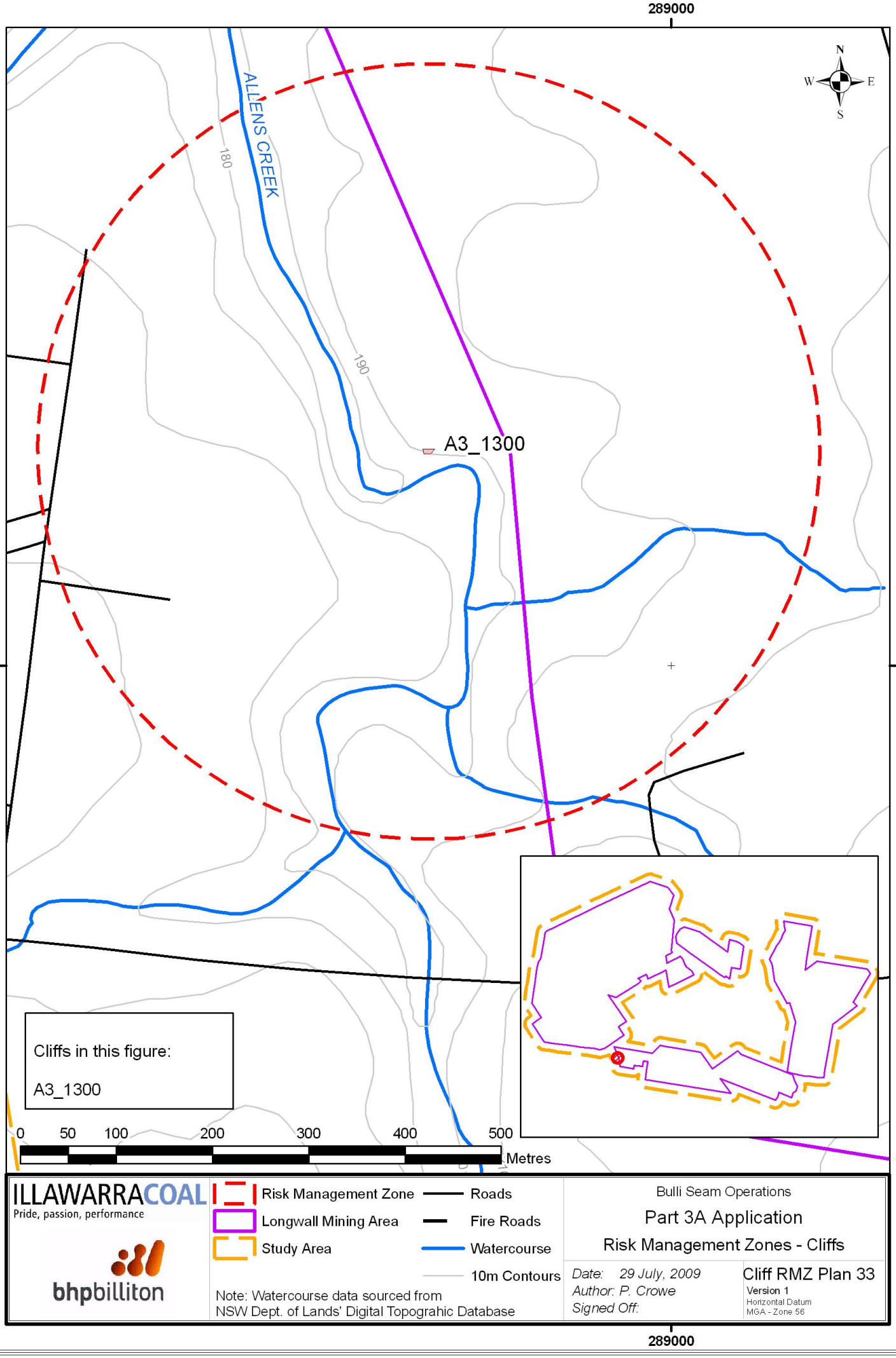
Part 3A Application

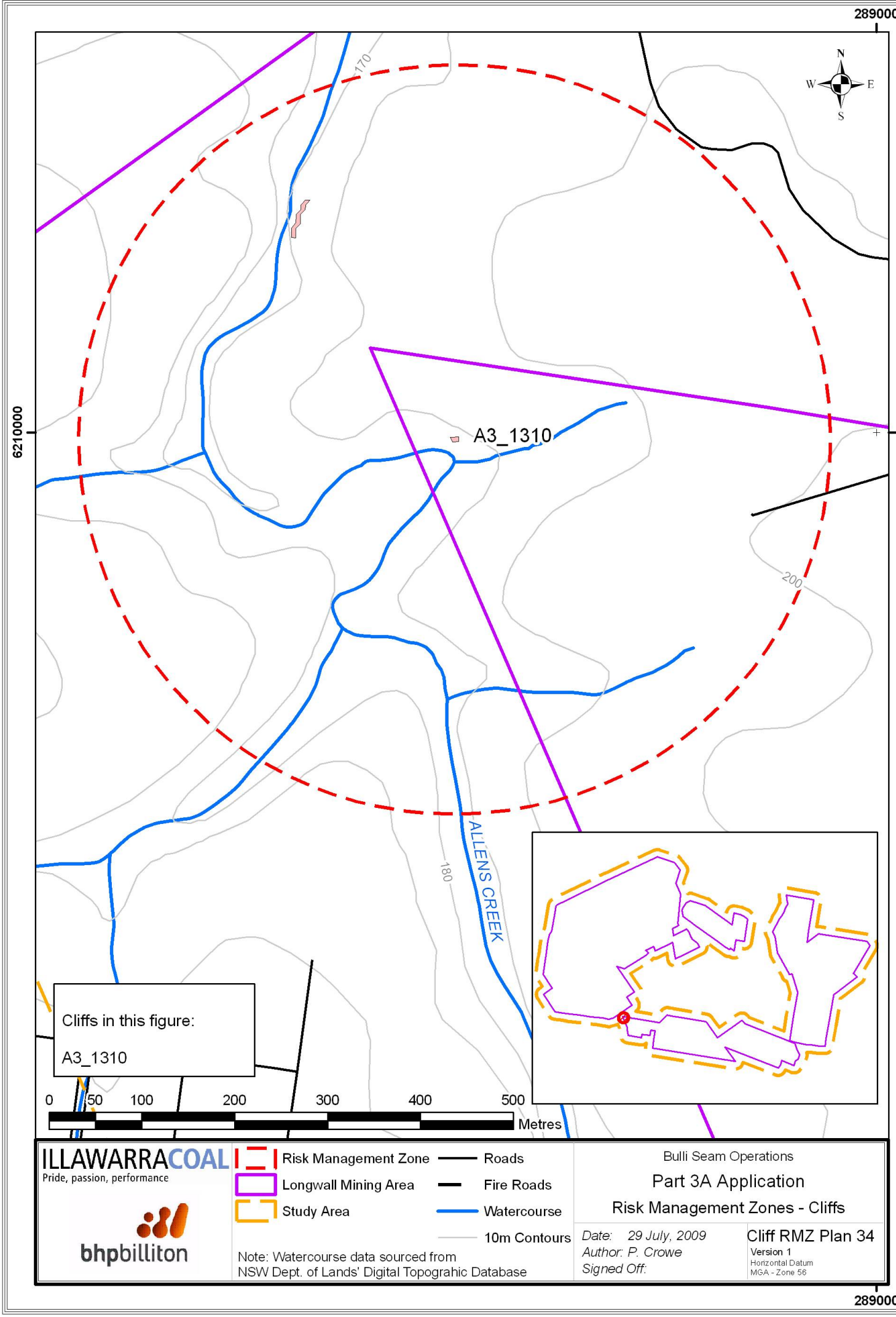
Risk Management Zones - Cliffs

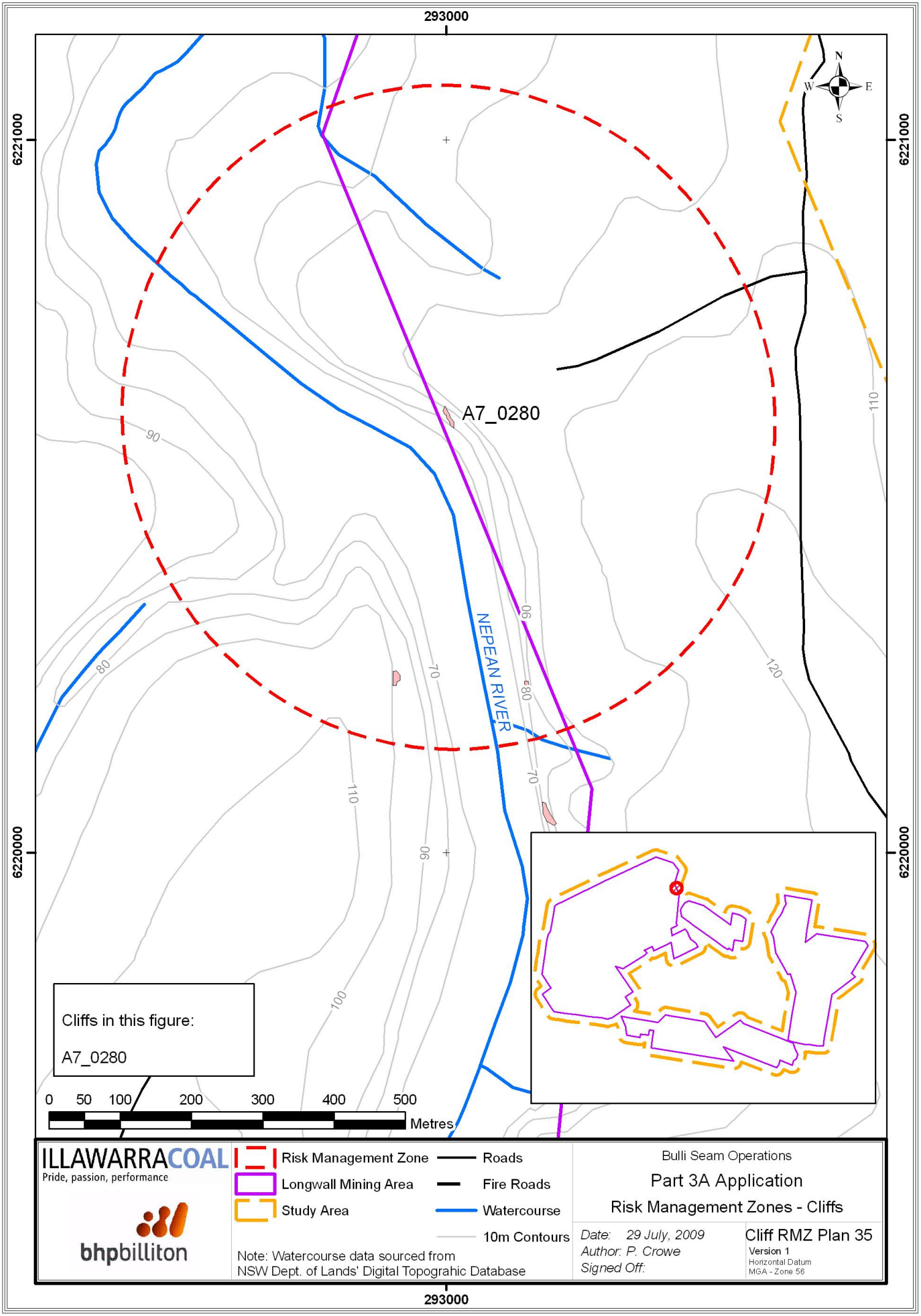
Date: 4 August, 2009
Author: P. Crowe
Signed Off:

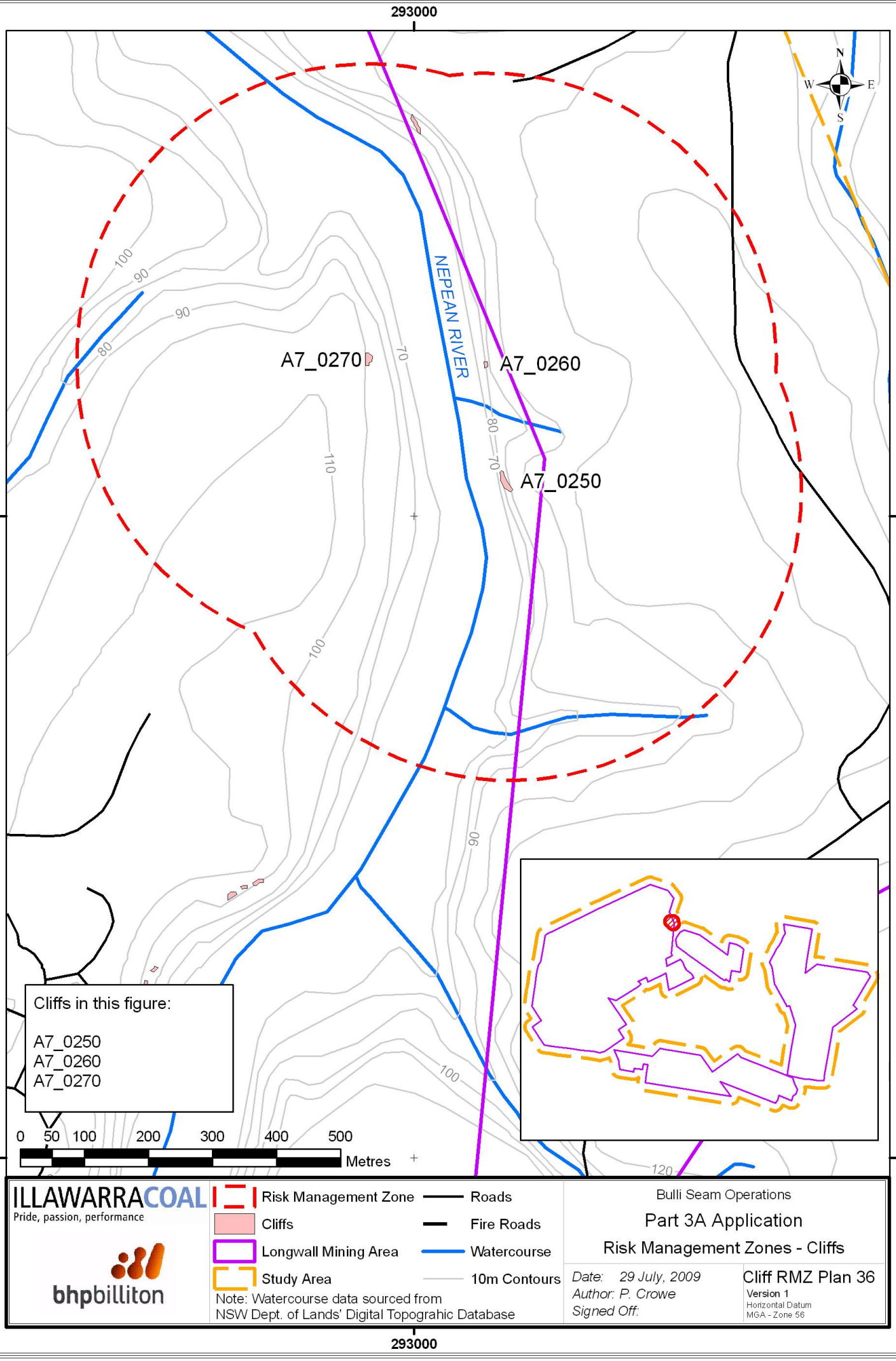
Cliff RMZ Plan 31
Version 1
Horizontal Datum
MGA - Zone 56

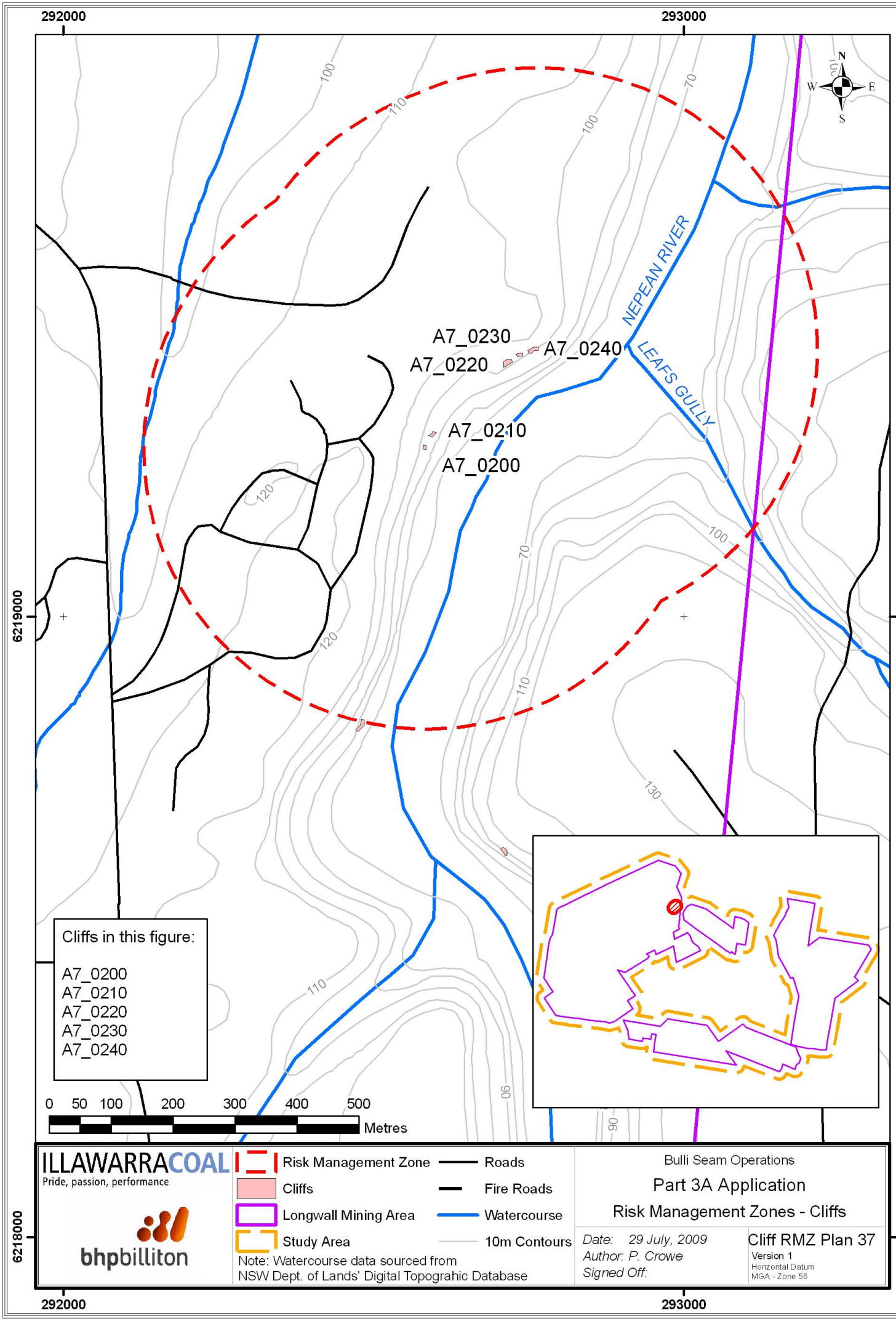

290000
6210000
N
W
E
S
160
170
180
190
200
CLEMENTS CREEK
A3_1320
Cliffs in this figure:
A3_1320
0
50
100
200
300
400
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 32
Version 1
Horizontal Datum
MGA - Zone 56

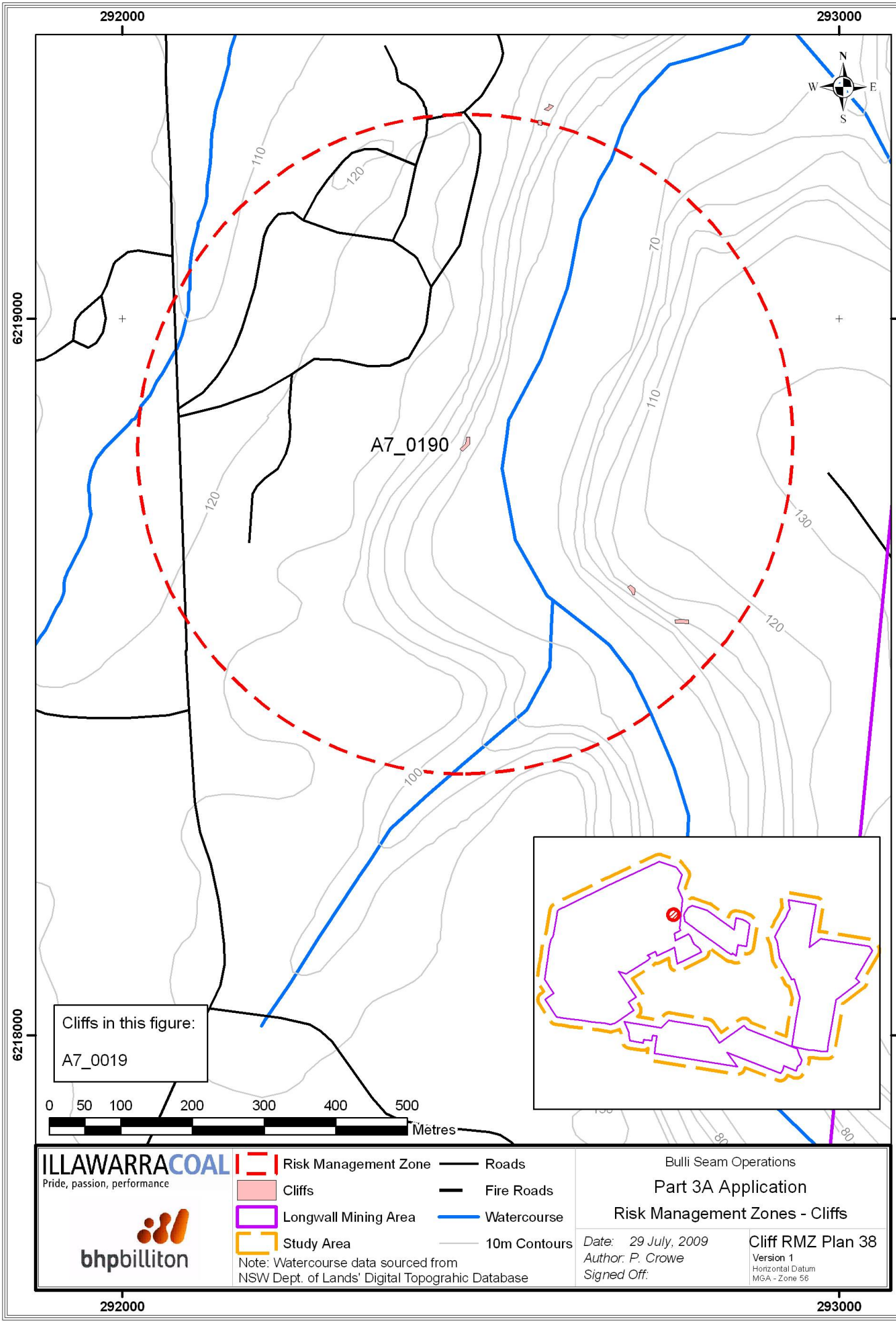

289000
6209000
N
W
E
S
ALLENS CREEK
180
190
A3_1300
Cliffs in this figure:
A3_1300
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 33
Version 1
Horizontal Datum
MGA - Zone 56

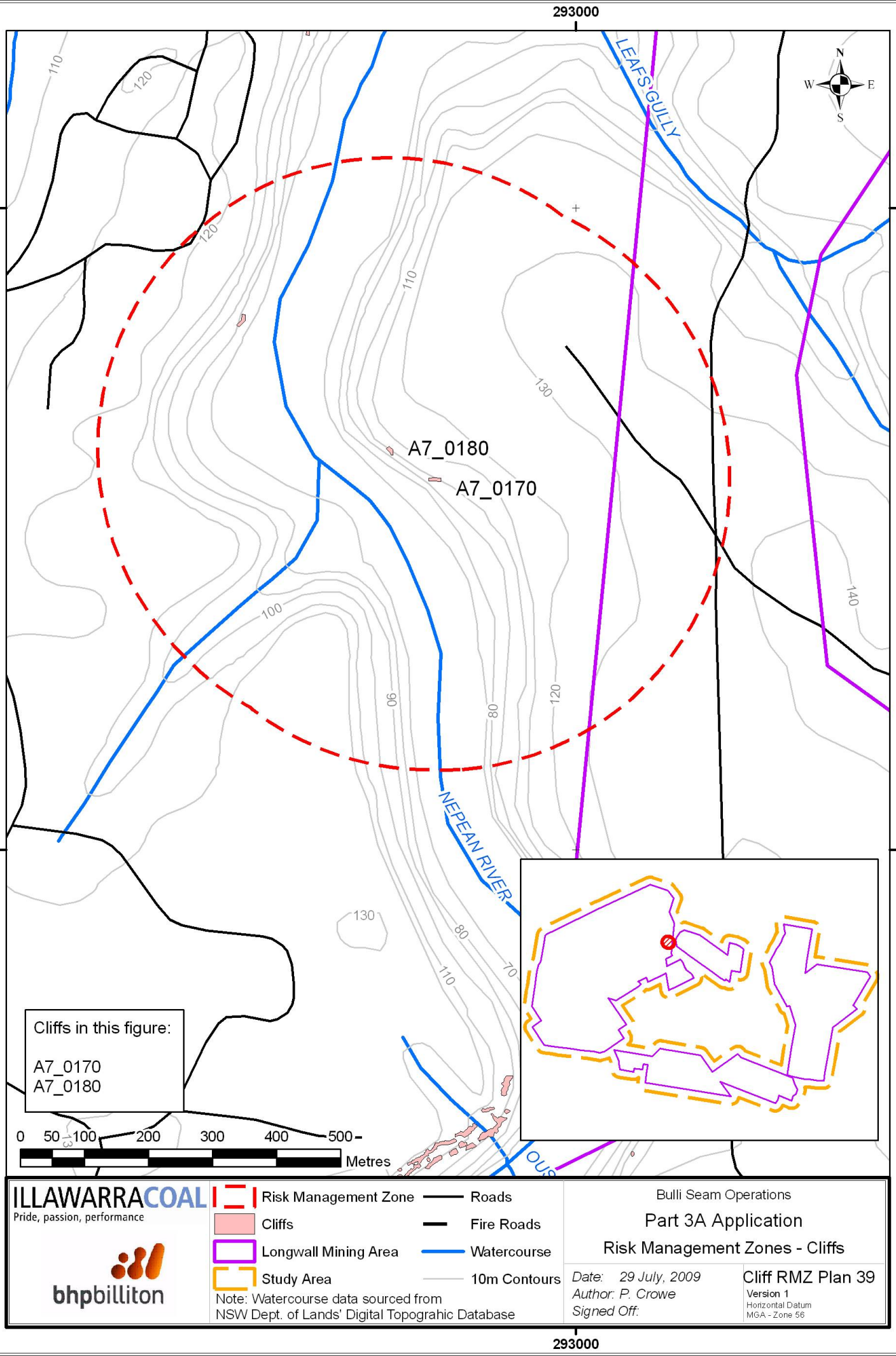

289000
6210000
N
W
E
S
170
A3_1310
200
180
ALLENS CREEK
Cliffs in this figure:
A3_1310
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 34
Version 1
Horizontal Datum
MGA - Zone 56

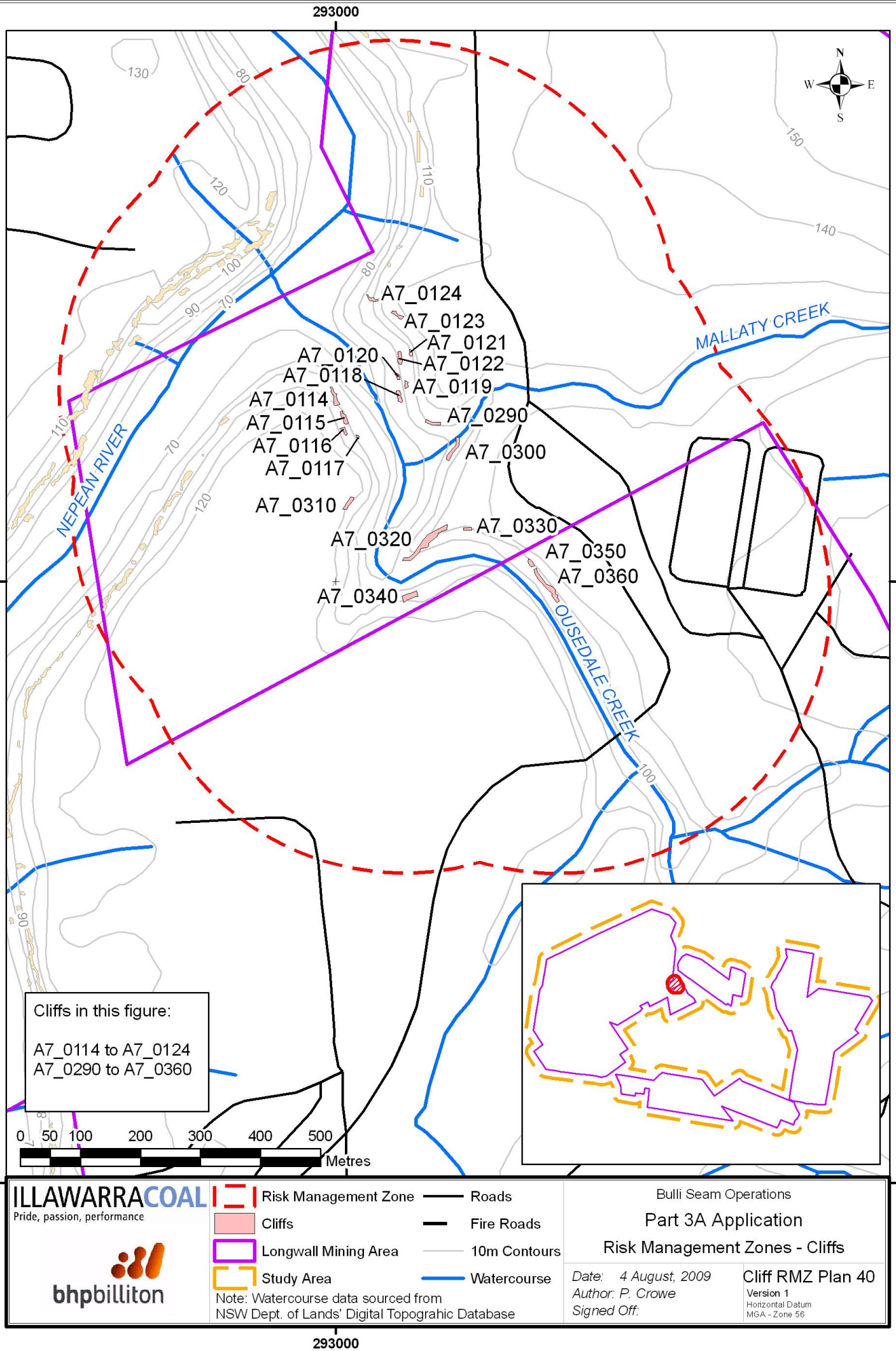

293000
6221000
6220000
N
W
E
S
A7_0280
NEPEAN RIVER
90
80
70
110
120
100
Cliffs in this figure:
A7_0280
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 35
Version 1
Horizontal Datum
MGA - Zone 56

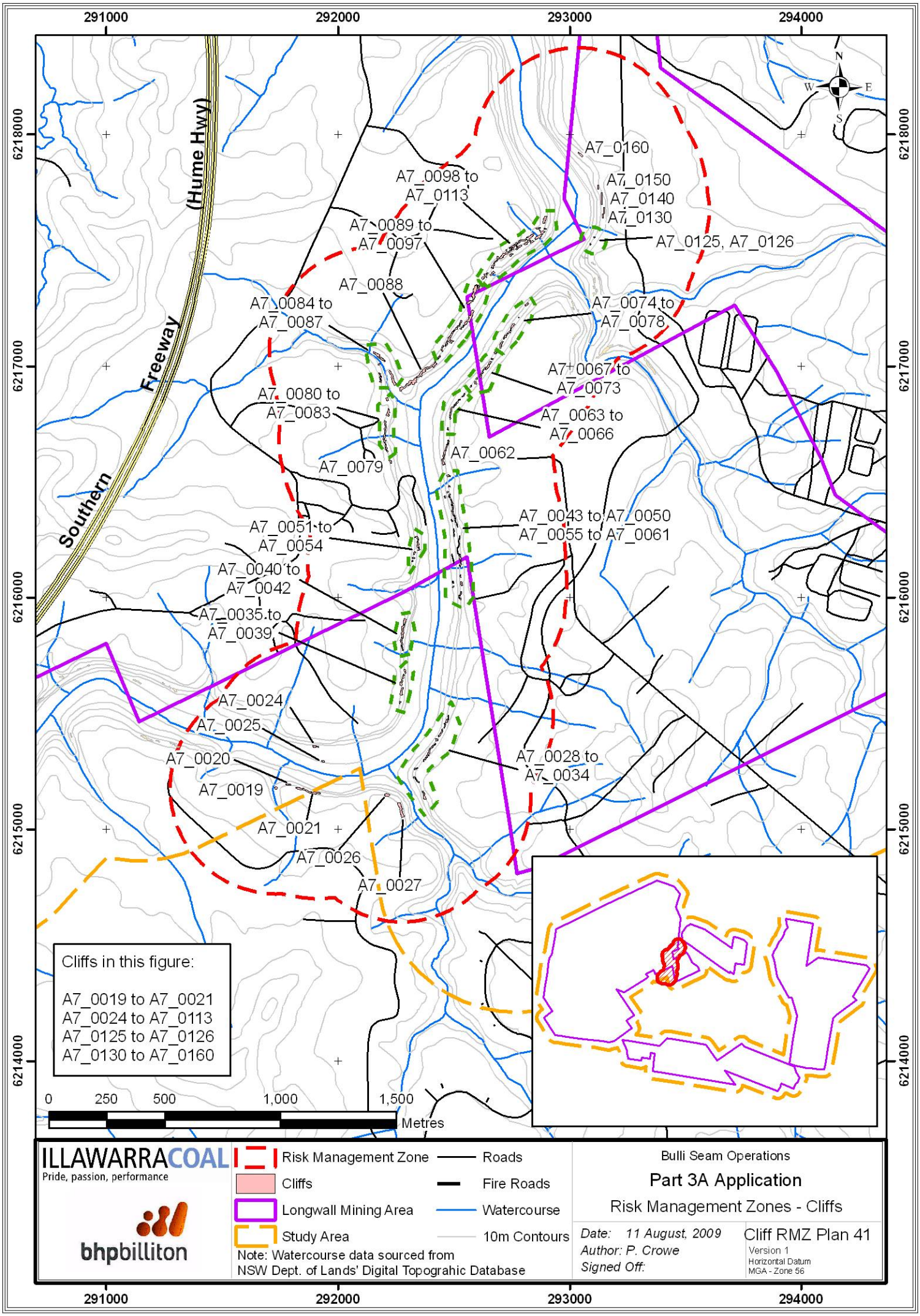

293000
6220000
6219000
N
W
E
S
NEPEAN RIVER
A7_0270
A7_0260
A7_0250
100
90
80
70
110
120
Cliffs in this figure:
A7_0250
A7_0260
A7_0270
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 36
Version 1
Horizontal Datum
MGA - Zone 56

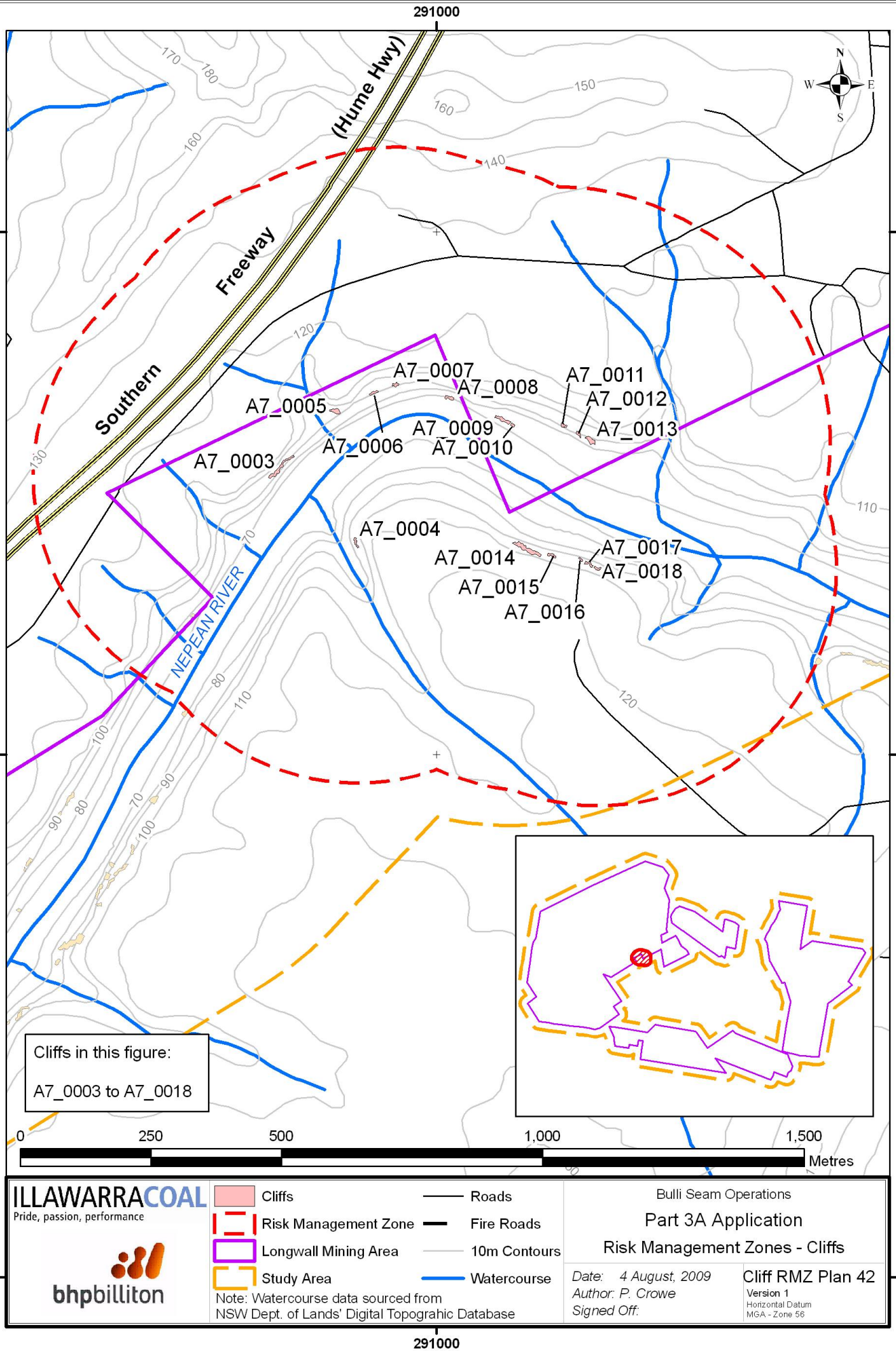

292000
293000
6219000
6218000
NEPEAN RIVER
LEAFS GULLY
A7_0230
A7_0240
A7_0220
A7_0210
A7_0200
Cliffs in this figure:
A7_0200
A7_0210
A7_0220
A7_0230
A7_0240
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 37
Version 1
Horizontal Datum
MGA - Zone 56

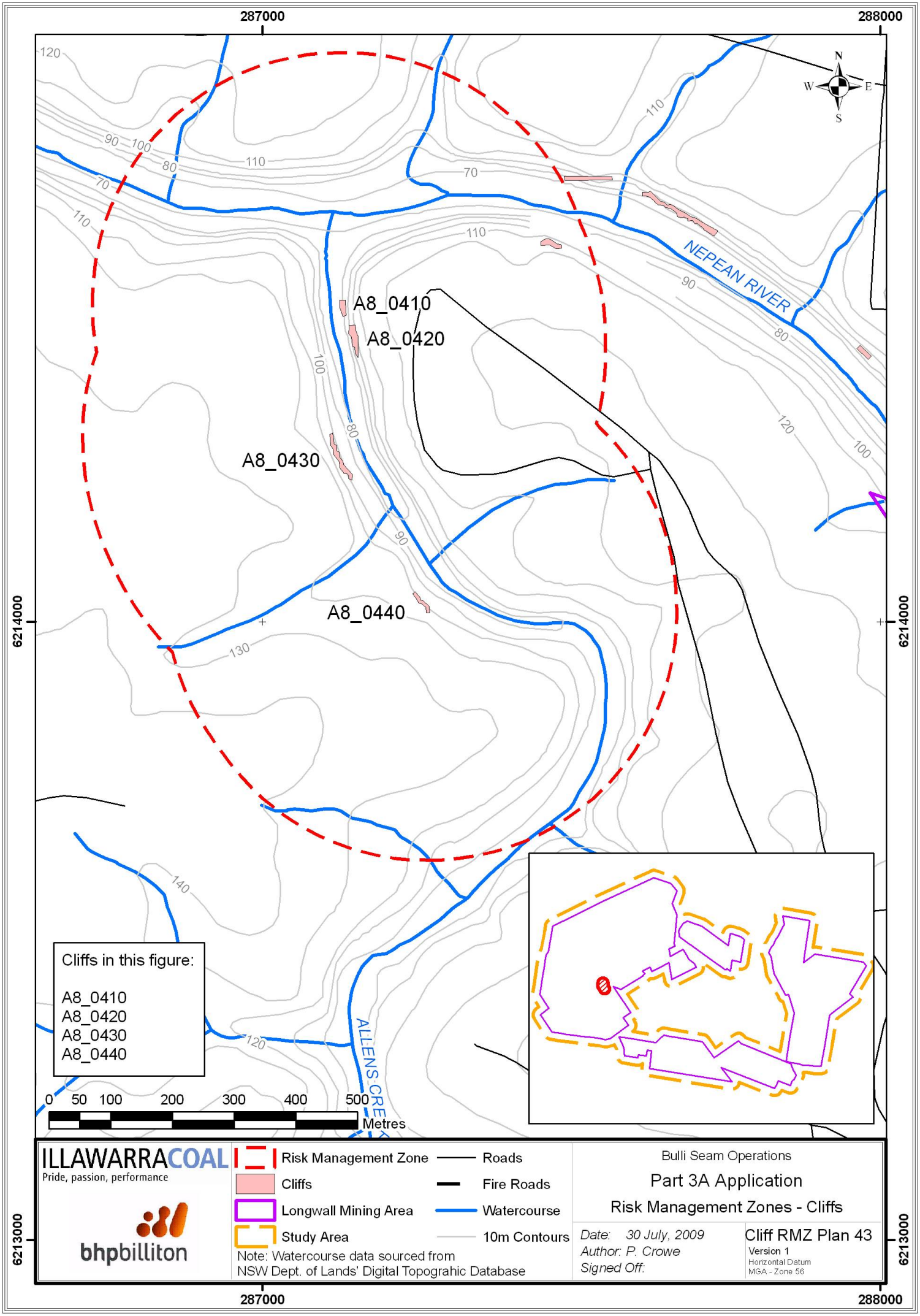

292000
293000
6219000
6218000
N
W
E
S
110
120
70
110
120
130
120
100
A7_0190
Cliffs in this figure:
A7_0019
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 38
Version 1
Horizontal Datum
MGA - Zone 56

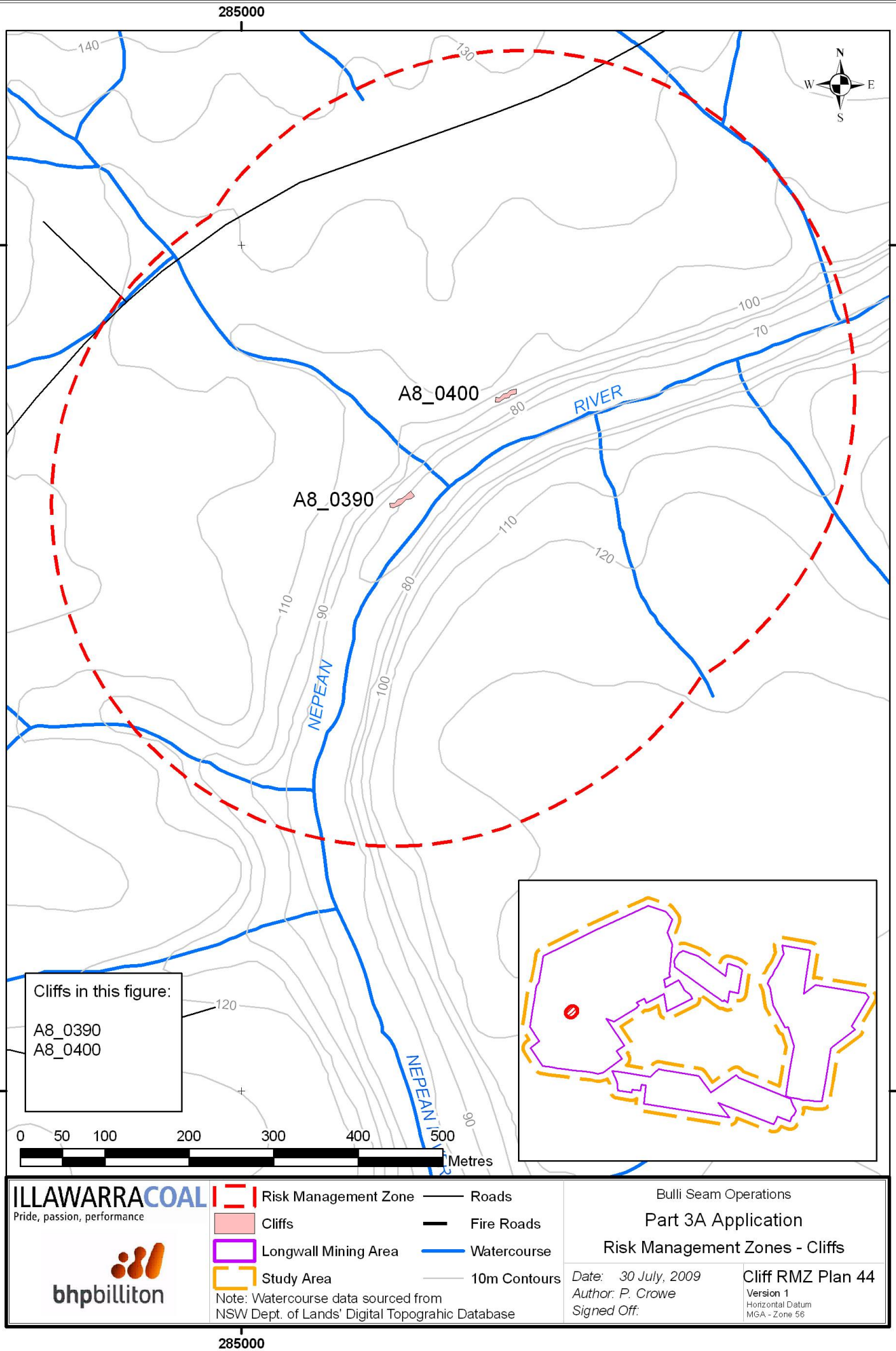

293000
6219000
6218000
LEAFS GULLY
NEPEAN RIVER
A7_0180
A7_0170
N
S
E
W
110
120
130
140
100
90
80
70
Cliffs in this figure:
A7_0170
A7_0180
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 29 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 39
Version 1
Horizontal Datum
MGA - Zone 56


293000
6217000
6216000
N
W
E
S
A7_0124
A7_0123
A7_0121
A7_0120
A7_0122
A7_0118
A7_0119
A7_0114
A7_0290
A7_0115
A7_0116
A7_0300
A7_0117
A7_0310
A7_0330
A7_0320
A7_0350
A7_0360
A7_0340
MALLATY CREEK
NEPEAN RIVER
OUSEDALE CREEK
Cliffs in this figure:
A7_0114 to A7_0124
A7_0290 to A7_0360
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
10m Contours
Watercourse
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 40
Version 1
Horizontal Datum
MGA - Zone 56


291000
292000
293000
294000
6218000
6217000
6216000
6215000
6214000
N
W
E
S
(Hume Hwy)
Freeway
Southern
A7_0160
A7_0150
A7_0140
A7_0130
A7_0125, A7_0126
A7_0098 to
A7_0113
A7_0089 to
A7_0097
A7_0088
A7_0084 to
A7_0087
A7_0074 to
A7_0078
A7_0067 to
A7_0073
A7_0080 to
A7_0083
A7_0063 to
A7_0066
A7_0062
A7_0079
A7_0043 to A7_0050
A7_0055 to A7_0061
A7_0051 to
A7_0054
A7_0040 to
A7_0042
A7_0035 to
A7_0039
A7_0024
A7_0025
A7_0020
A7_0019
A7_0021
A7_0026
A7_0027
A7_0028 to
A7_0034
Cliffs in this figure:
A7_0019 to A7_0021
A7_0024 to A7_0113
A7_0125 to A7_0126
A7_0130 to A7_0160
0
250
500
1,000
1,500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 11 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 41
Version 1
Horizontal Datum
MGA - Zone 56


291000
6216000
6215000
6214000
(Hume Hwy)
Freeway
Southern
NEPEAN RIVER
A7_0003
A7_0004
A7_0005
A7_0006
A7_0007
A7_0008
A7_0009
A7_0010
A7_0011
A7_0012
A7_0013
A7_0014
A7_0015
A7_0016
A7_0017
A7_0018
N
S
E
W
Cliffs in this figure:
A7_0003 to A7_0018
0
250
500
1,000
1,500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Cliffs
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
10m Contours
Watercourse
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 42
Version 1
Horizontal Datum
MGA - Zone 56


287000
288000
6214000
6213000
N
S
E
W
NEPEAN RIVER
A8_0410
A8_0420
A8_0430
A8_0440
ALLENS CREEK
120
110
100
90
80
70
130
140
Cliffs in this figure:
A8_0410
A8_0420
A8_0430
A8_0440
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 43
Version 1
Horizontal Datum
MGA - Zone 56



ILLAWARRACOAL
Pride, passion, performance

bhpbilliton

Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours

Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database

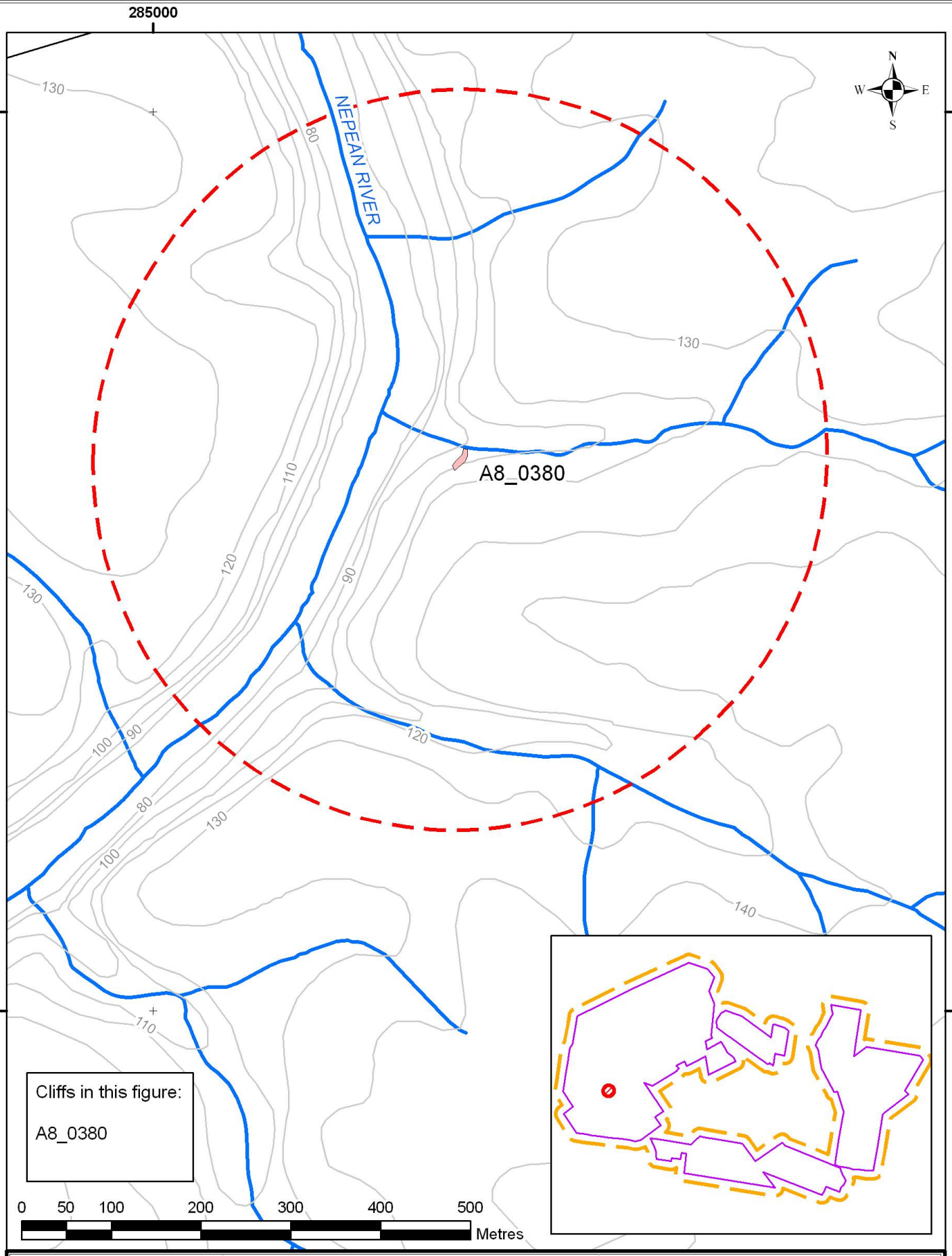
Bulli Seam Operations

Part 3A Application

Risk Management Zones - Cliffs

Date: 30 July, 2009
Author: P. Crowe
Signed Off:

Cliff RMZ Plan 44
Version 1
Horizontal Datum
MGA - Zone 56



ILLAWARRACOAL
Pride, passion, performance

bhpbilliton

Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours

Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database

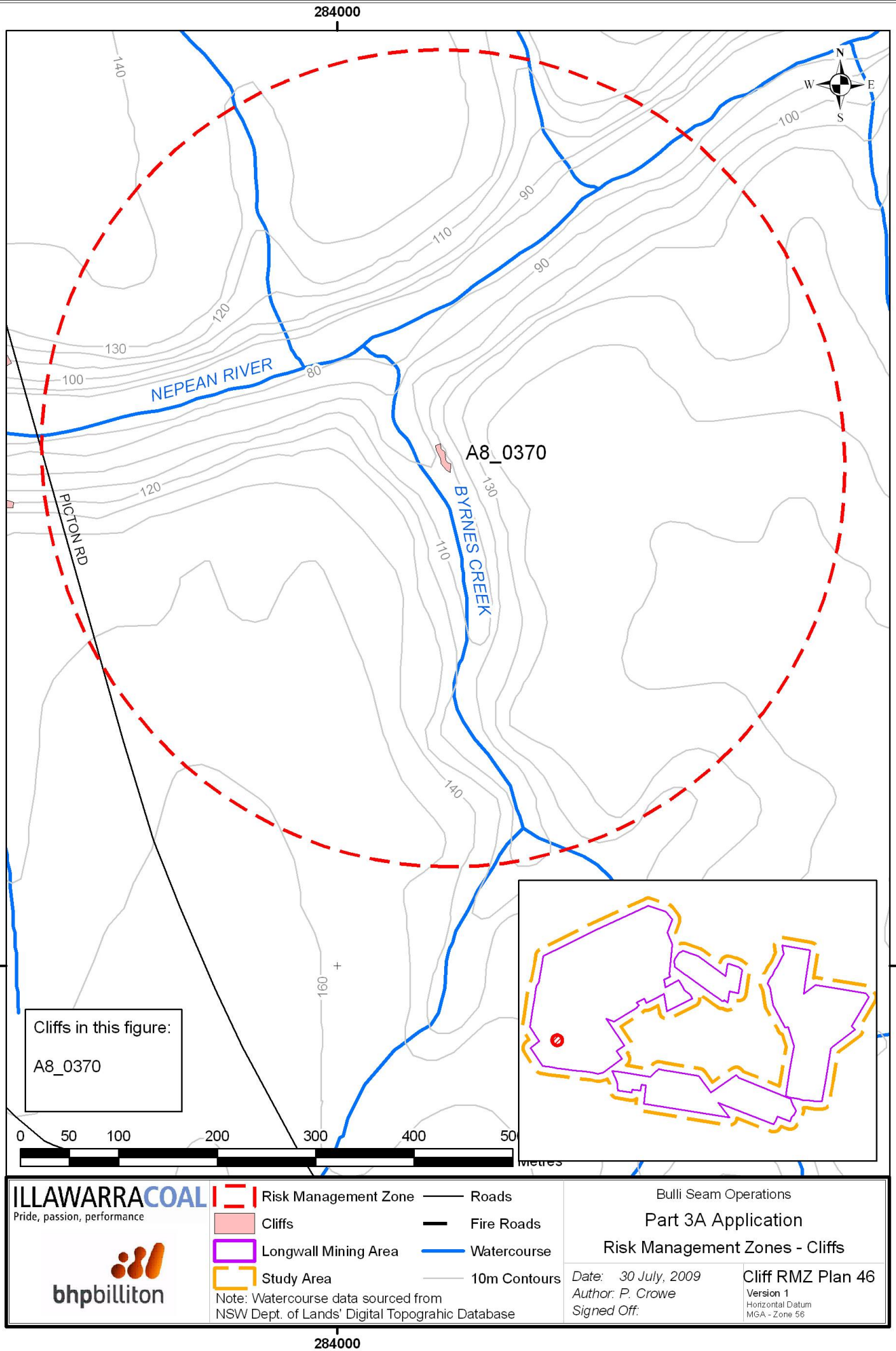
Bulli Seam Operations

Part 3A Application

Risk Management Zones - Cliffs

Date: 30 July, 2009
Author: P. Crowe
Signed Off:

Cliff RMZ Plan 45
Version 1
Horizontal Datum
MGA - Zone 56



ILLAWARRACOAL
Pride, passion, performance

bhpbilliton

Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours

Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database

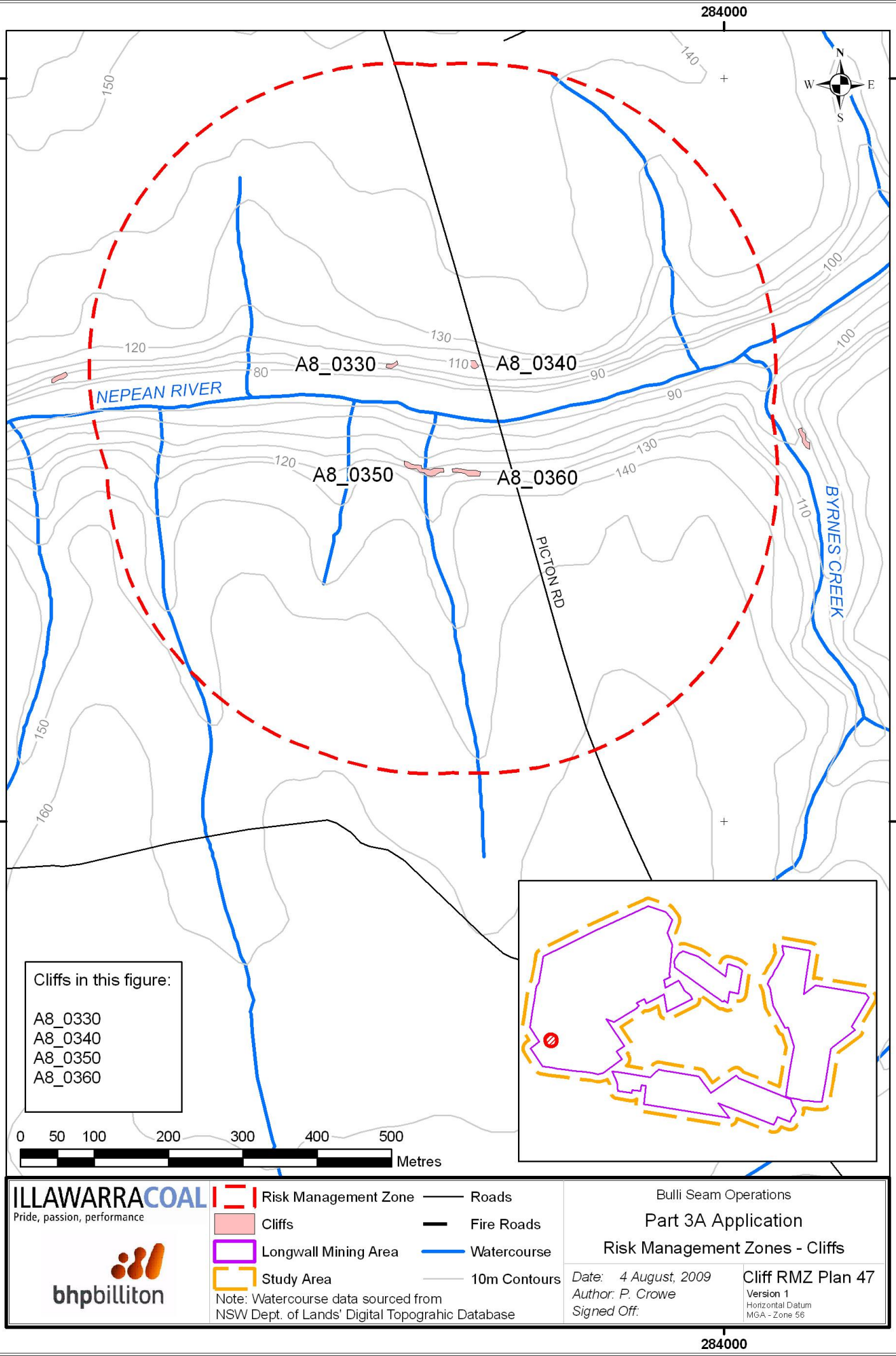
Bulli Seam Operations

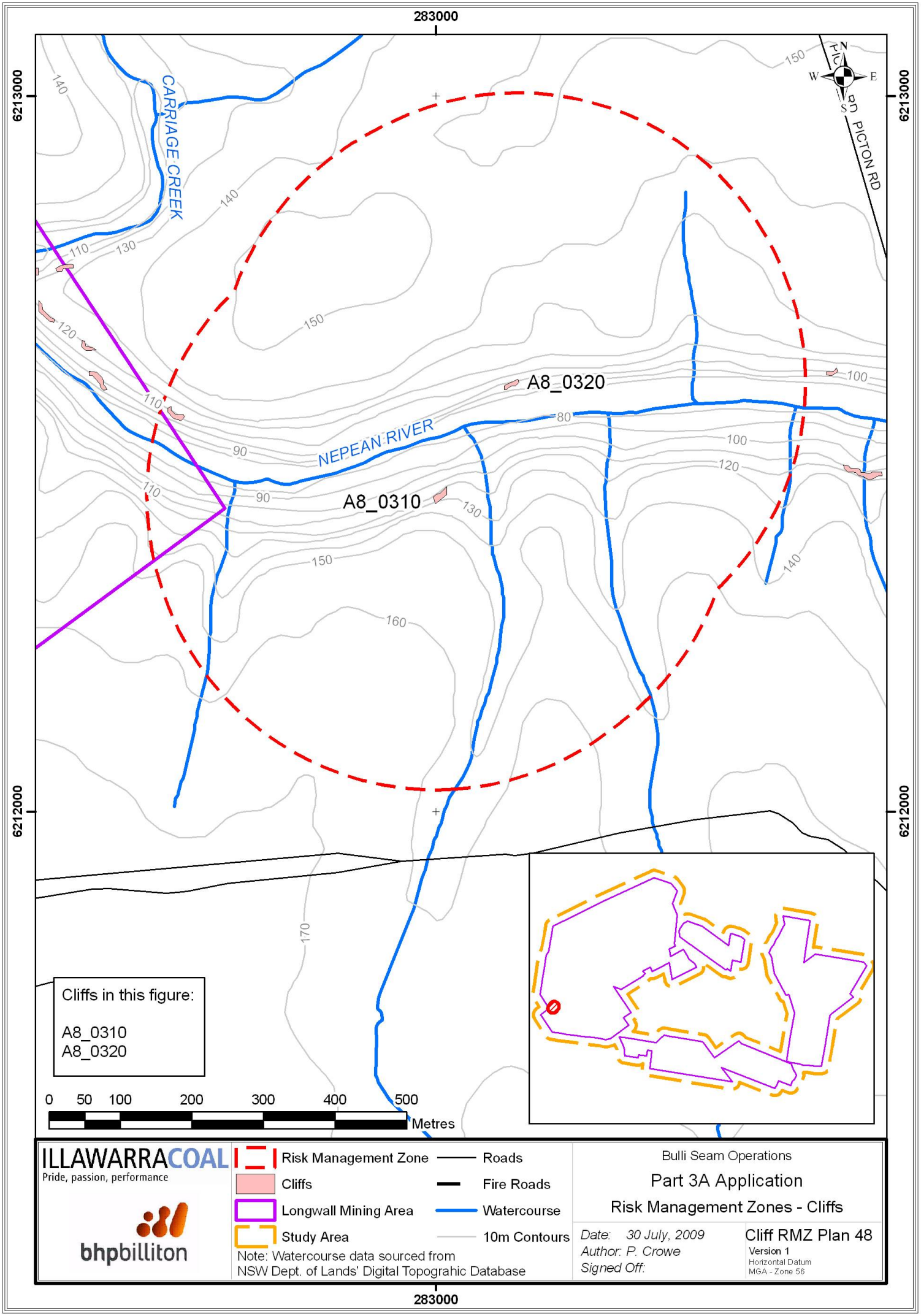
Part 3A Application

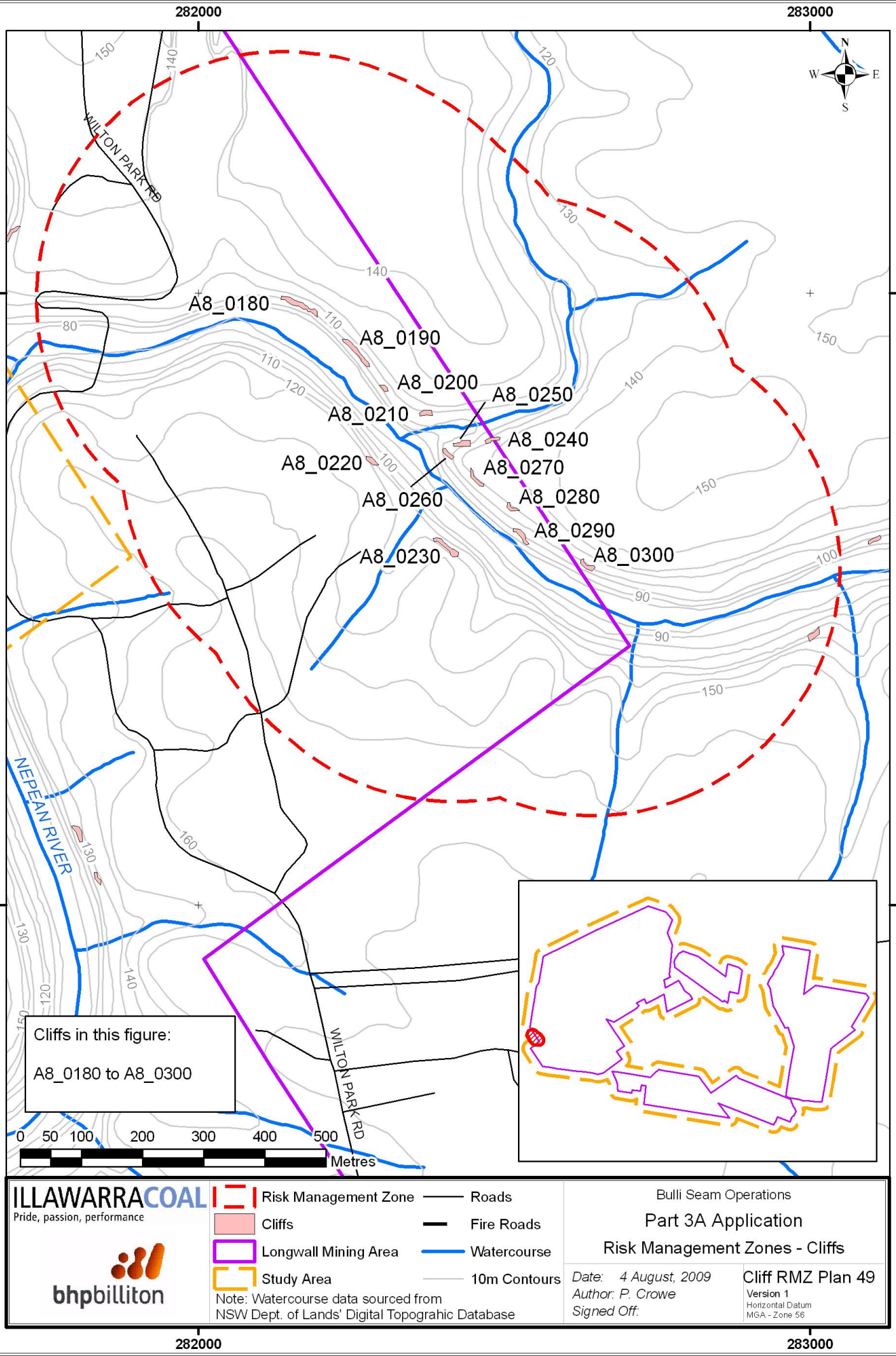
Risk Management Zones - Cliffs

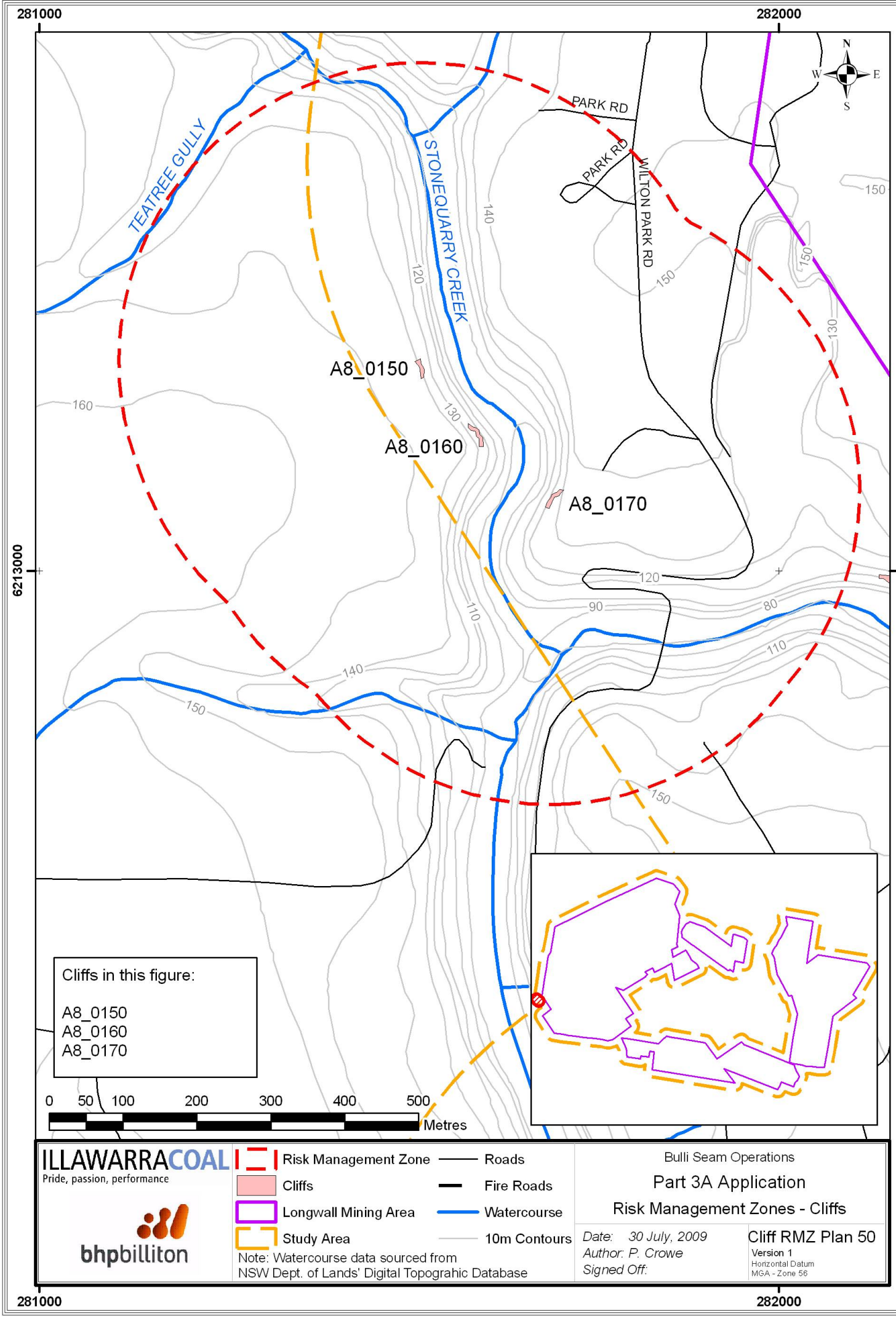
Date: *30 July, 2009*
Author: *P. Crowe*
Signed Off:

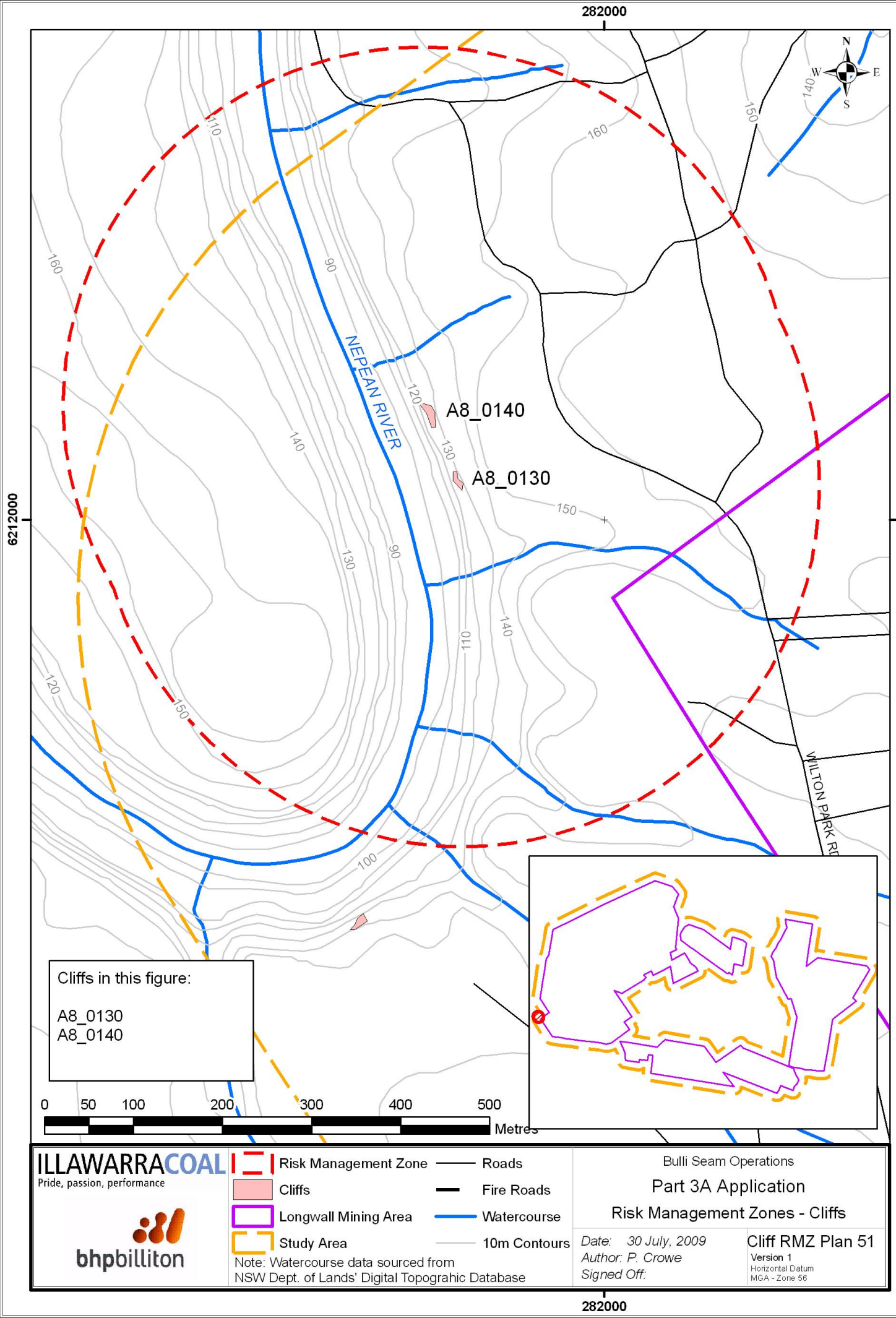
Cliff RMZ Plan 46
Version 1
Horizontal Datum
MGA - Zone 56

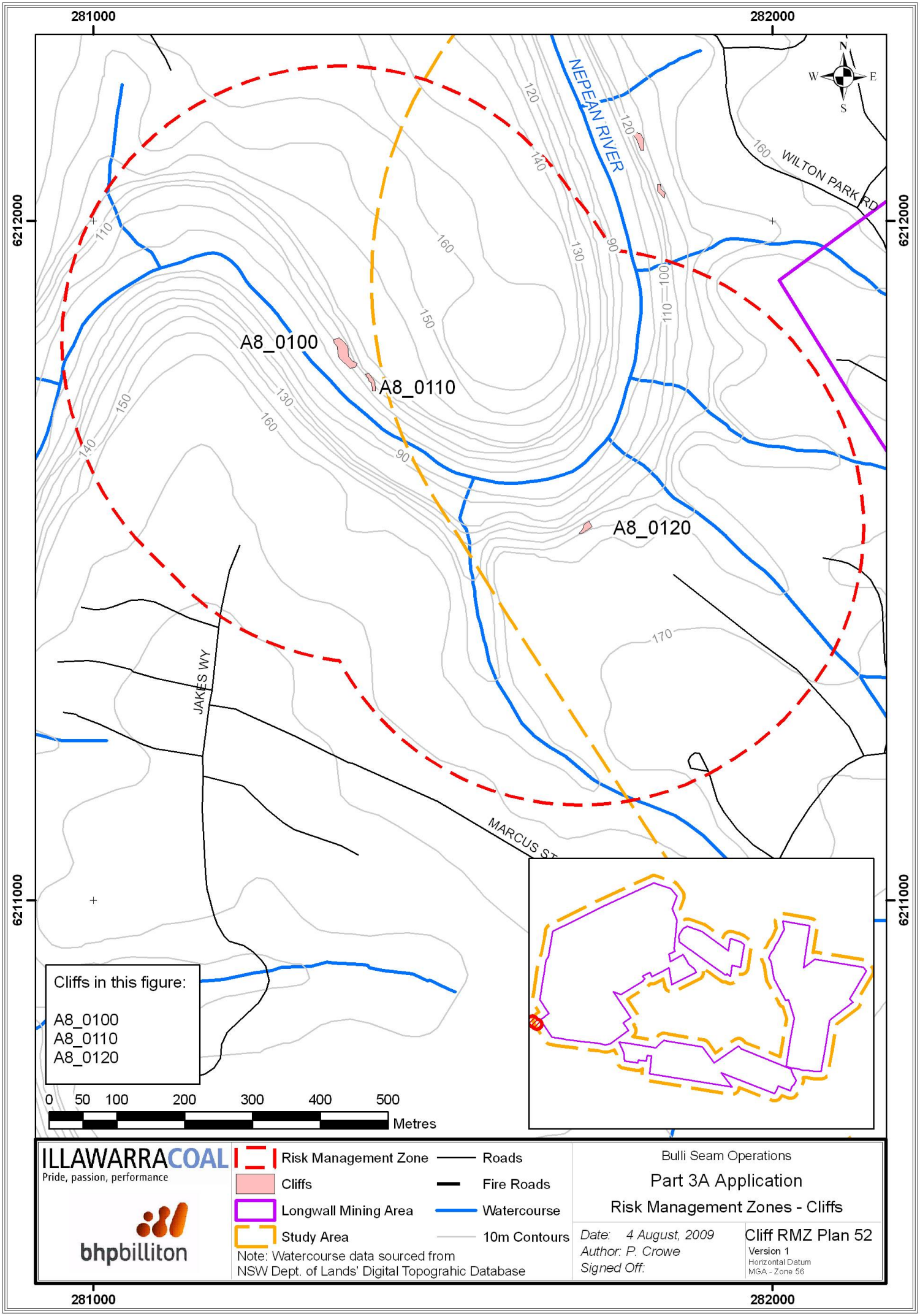

284000
6213000
6212000
N
W
E
S
140
150
120
130
110
100
80
90
A8_0330
A8_0340
A8_0350
A8_0360
NEPEAN RIVER
PICTON RD
BYRNES CREEK
160
Cliffs in this figure:
A8_0330
A8_0340
A8_0350
A8_0360
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 47
Version 1
Horizontal Datum
MGA - Zone 56

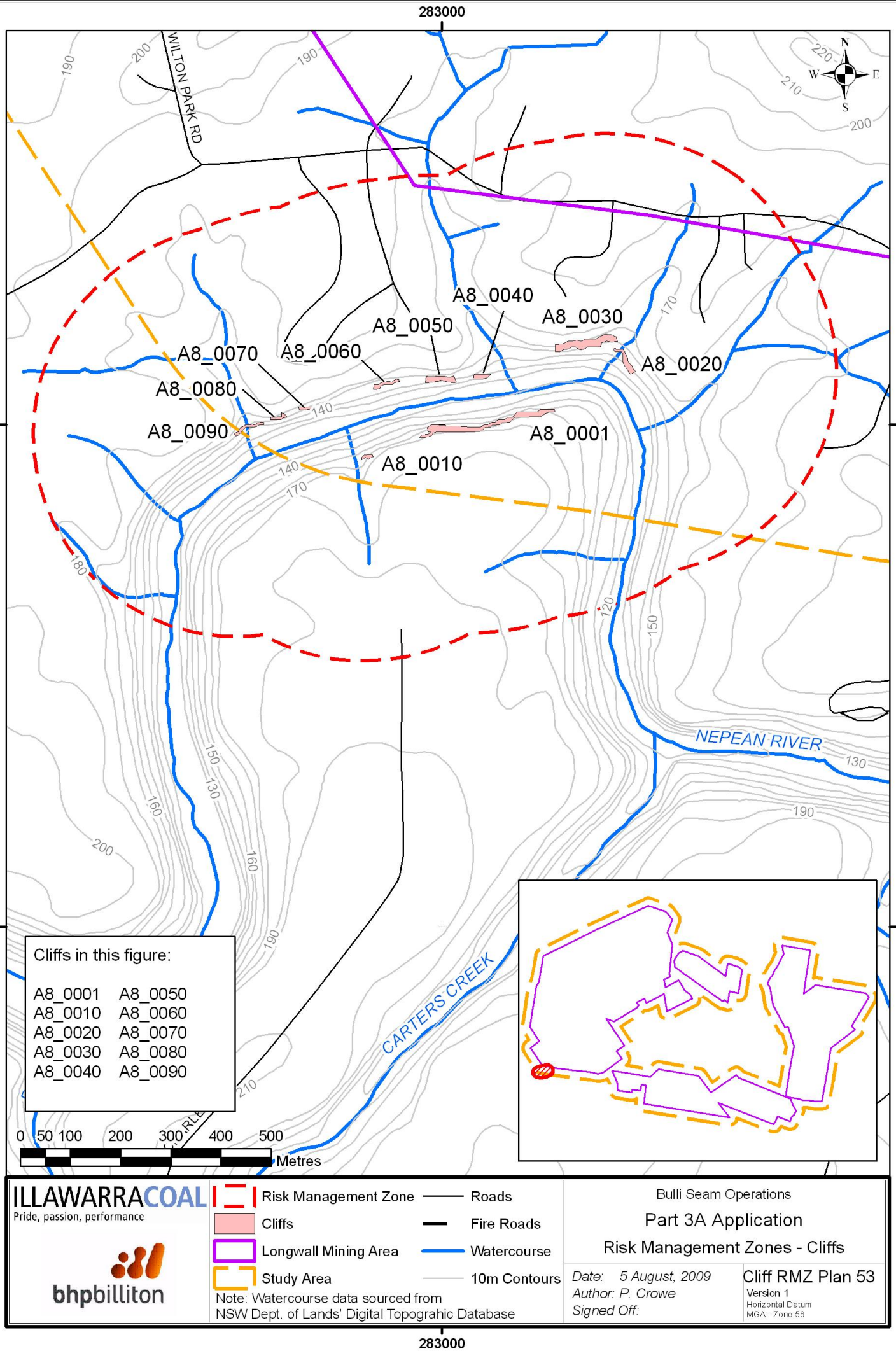

283000
6213000
6212000
CARRIAGE CREEK
PICTON RD
NEPEAN RIVER
A8_0320
A8_0310
140
150
110
130
120
100
90
80
160
170
Cliffs in this figure:
A8_0310
A8_0320
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 48
Version 1
Horizontal Datum
MGA - Zone 56

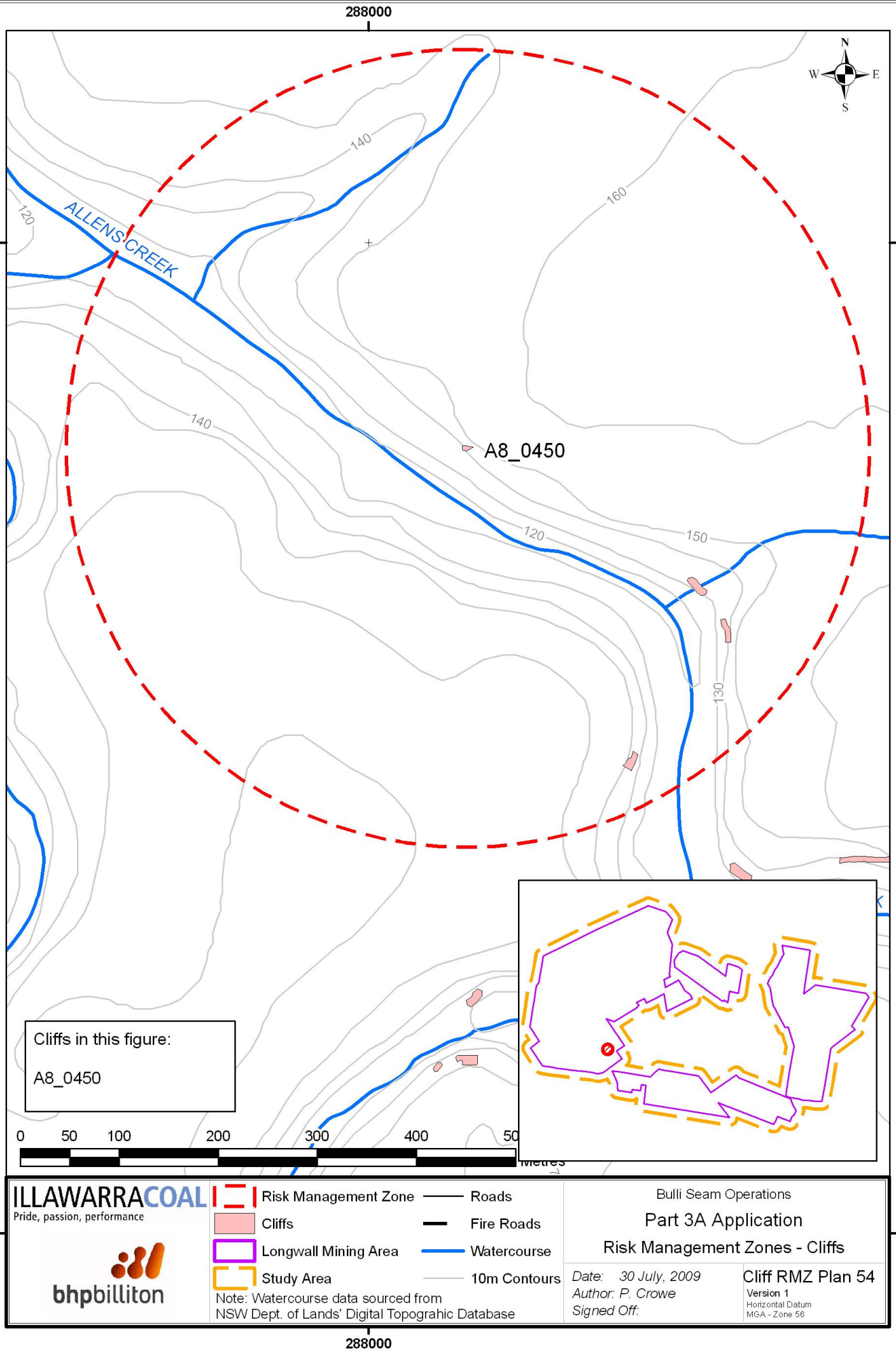

282000
283000
6213000
6212000
N
W
E
S
WILTON PARK RD
NEPEAN RIVER
A8_0180
A8_0190
A8_0200
A8_0210
A8_0220
A8_0230
A8_0240
A8_0250
A8_0260
A8_0270
A8_0280
A8_0290
A8_0300
Cliffs in this figure:
A8_0180 to A8_0300
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 49
Version 1
Horizontal Datum
MGA - Zone 56

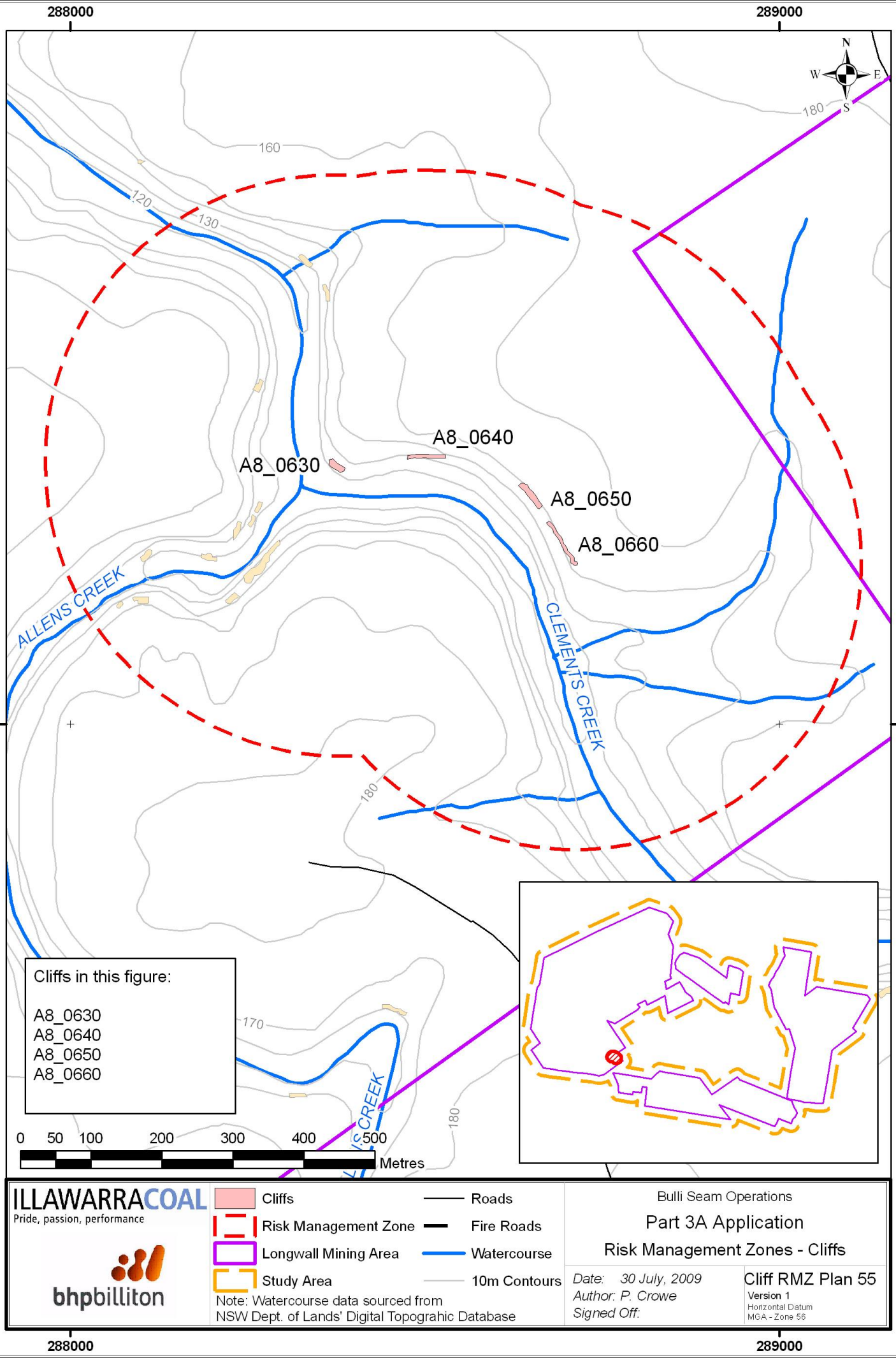

281000
282000
6213000
N
W
E
S
TEATREE GULLY
STONEQUARRY CREEK
PARK RD
PARK RD
WILTON PARK RD
A8_0150
A8_0160
A8_0170
160
140
120
130
110
90
80
150
Cliffs in this figure:
A8_0150
A8_0160
A8_0170
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 50
Version 1
Horizontal Datum
MGA - Zone 56

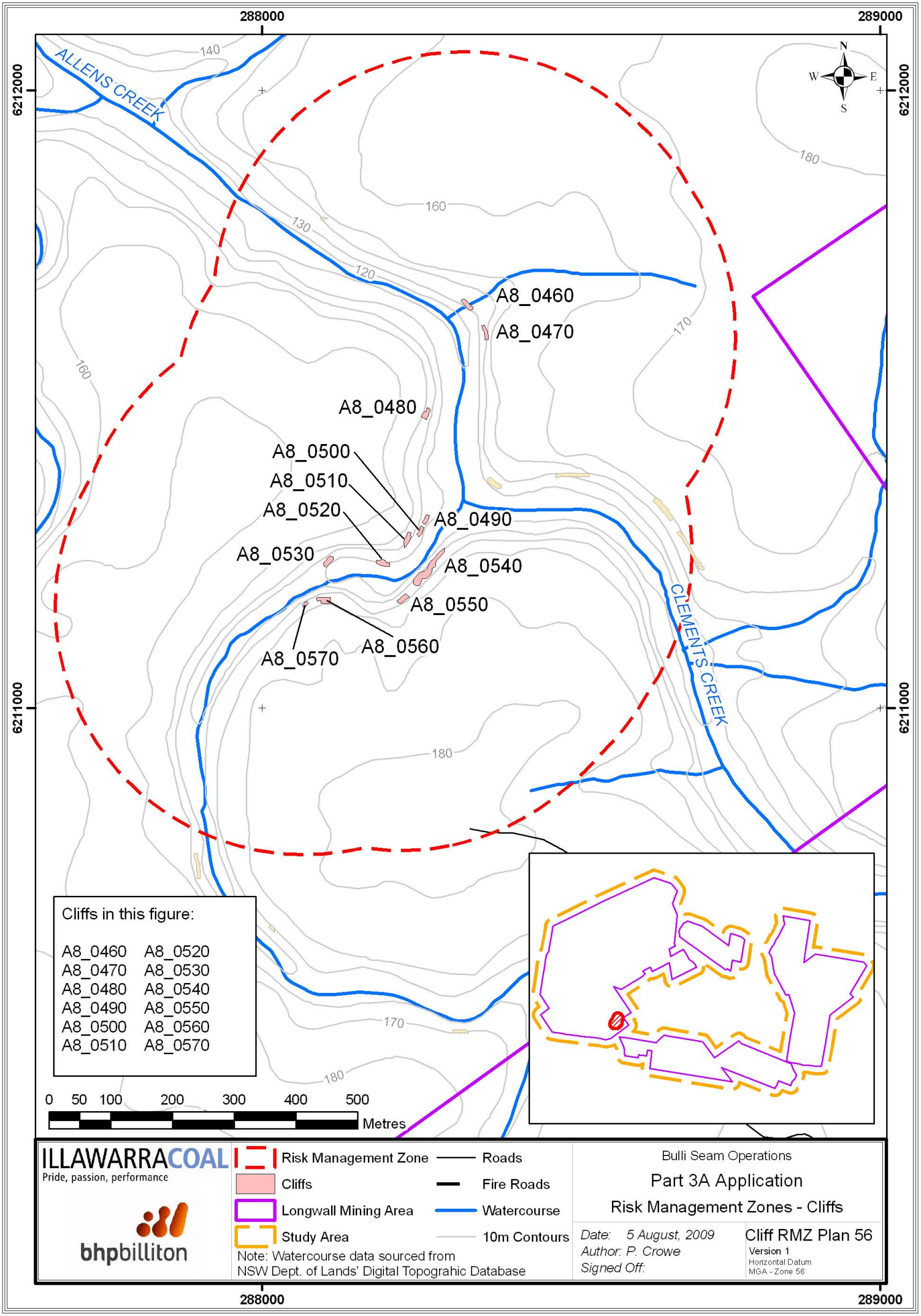

282000
6212000
N
S
E
W
NEPEAN RIVER
A8_0140
A8_0130
WILTON PARK RD
160
110
90
140
150
120
130
100
Cliffs in this figure:
A8_0130
A8_0140
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 51
Version 1
Horizontal Datum
MGA - Zone 56

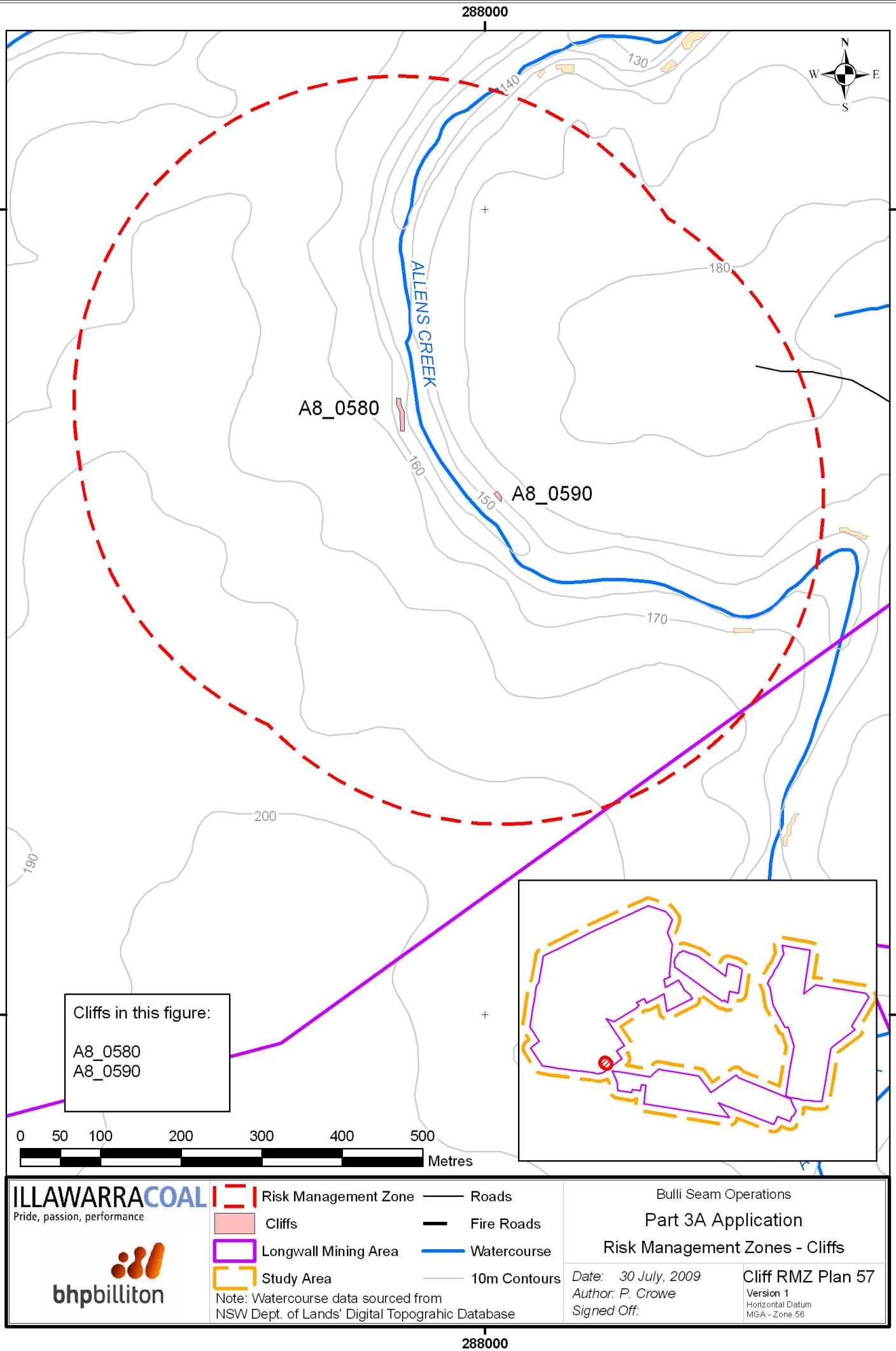

281000
282000
6212000
6211000
N
S
E
W
NEPEAN RIVER
WILTON PARK RD
JAKES WY
MARCUS ST
A8_0100
A8_0110
A8_0120
120
140
160
110
130
150
90
100
170
Cliffs in this figure:
A8_0100
A8_0110
A8_0120
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 4 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 52
Version 1
Horizontal Datum
MGA - Zone 56

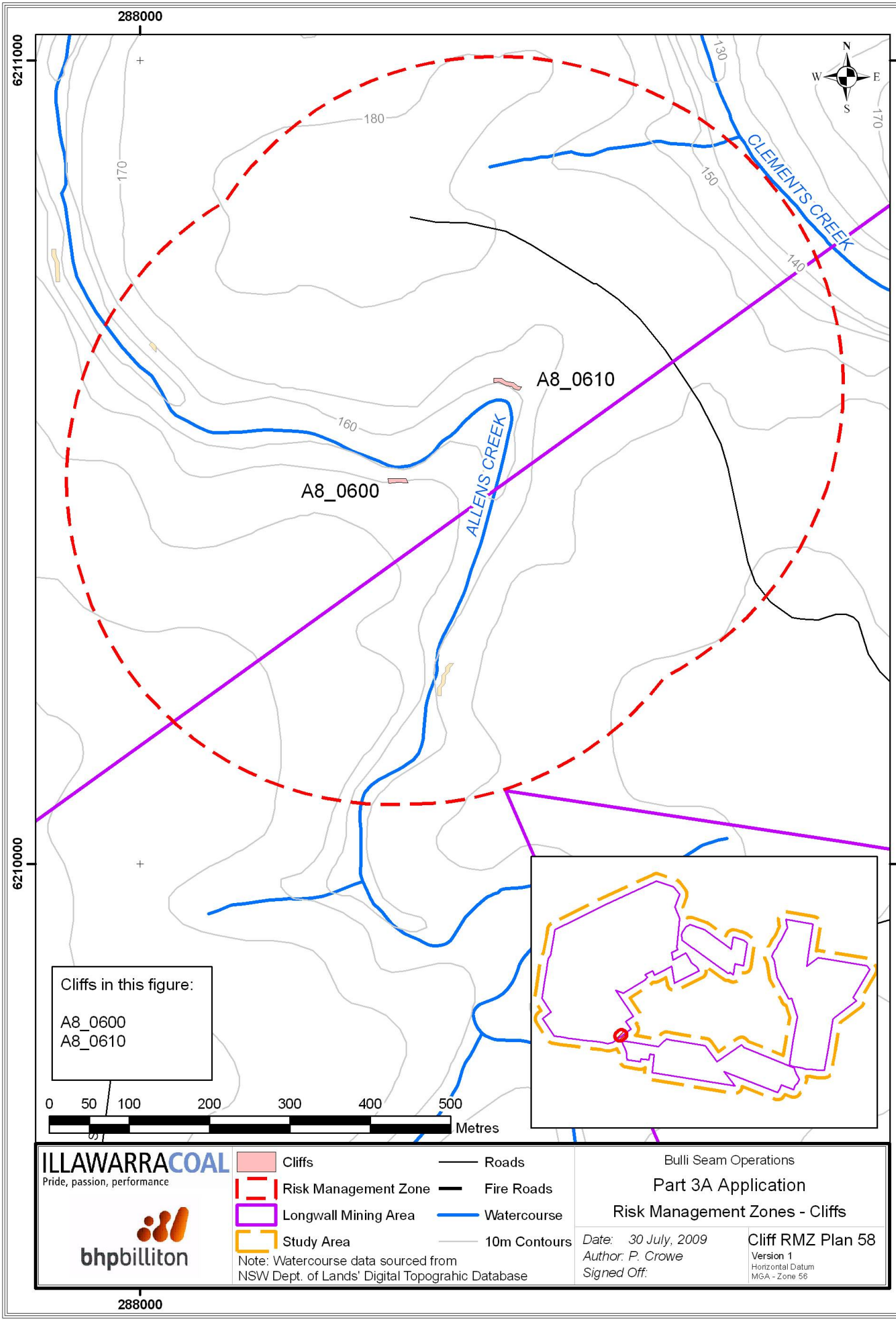

283000
6210000
6209000
WILTON PARK RD
NEPEAN RIVER
CARTERS CREEK
A8_0001
A8_0010
A8_0020
A8_0030
A8_0040
A8_0050
A8_0060
A8_0070
A8_0080
A8_0090
Cliffs in this figure:
A8_0001 A8_0050
A8_0010 A8_0060
A8_0020 A8_0070
A8_0030 A8_0080
A8_0040 A8_0090
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 5 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 53
Version 1
Horizontal Datum
MGA - Zone 56

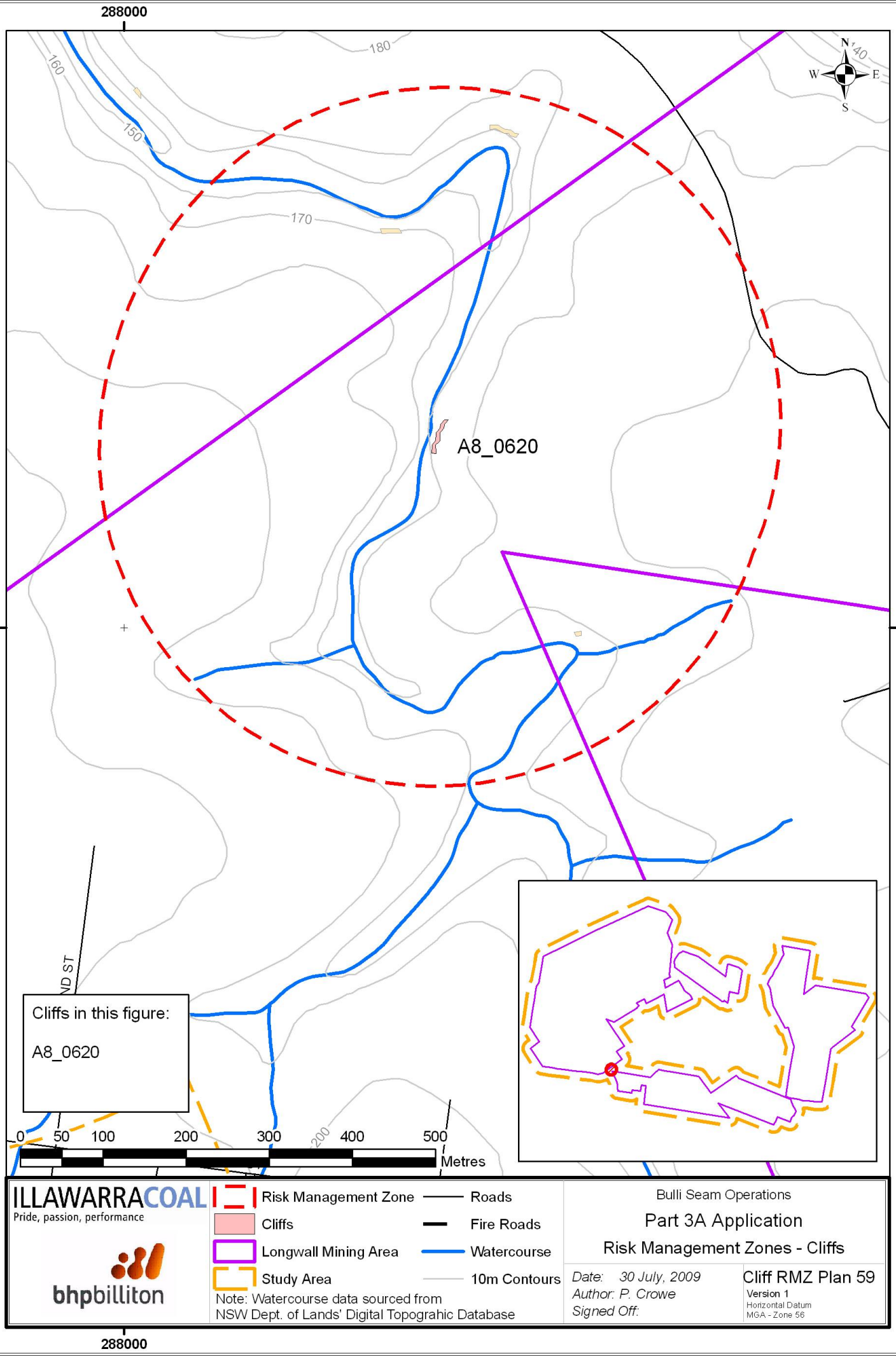

288000
6212000
6211000
N
W
E
S
ALLENS CREEK
120
140
160
150
130
A8_0450
Cliffs in this figure:
A8_0450
0
50
100
200
300
400
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 54
Version 1
Horizontal Datum
MGA - Zone 56

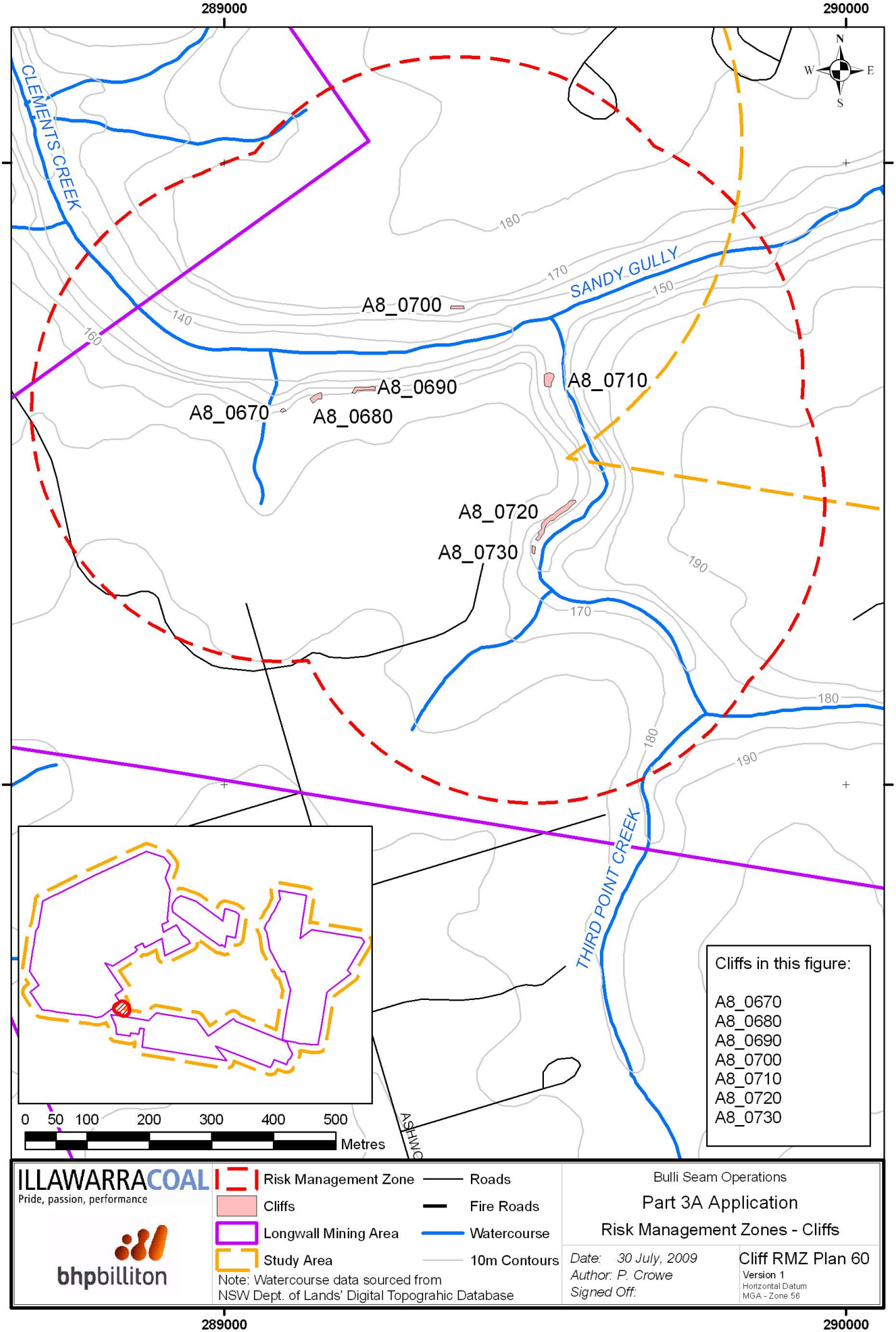

288000
289000
6211000
N
W
E
S
160
120
130
180
A8_0630
A8_0640
A8_0650
A8_0660
ALLENS CREEK
CLEMENTS CREEK
170
Cliffs in this figure:
A8_0630
A8_0640
A8_0650
A8_0660
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Cliffs
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 55
Version 1
Horizontal Datum
MGA - Zone 56

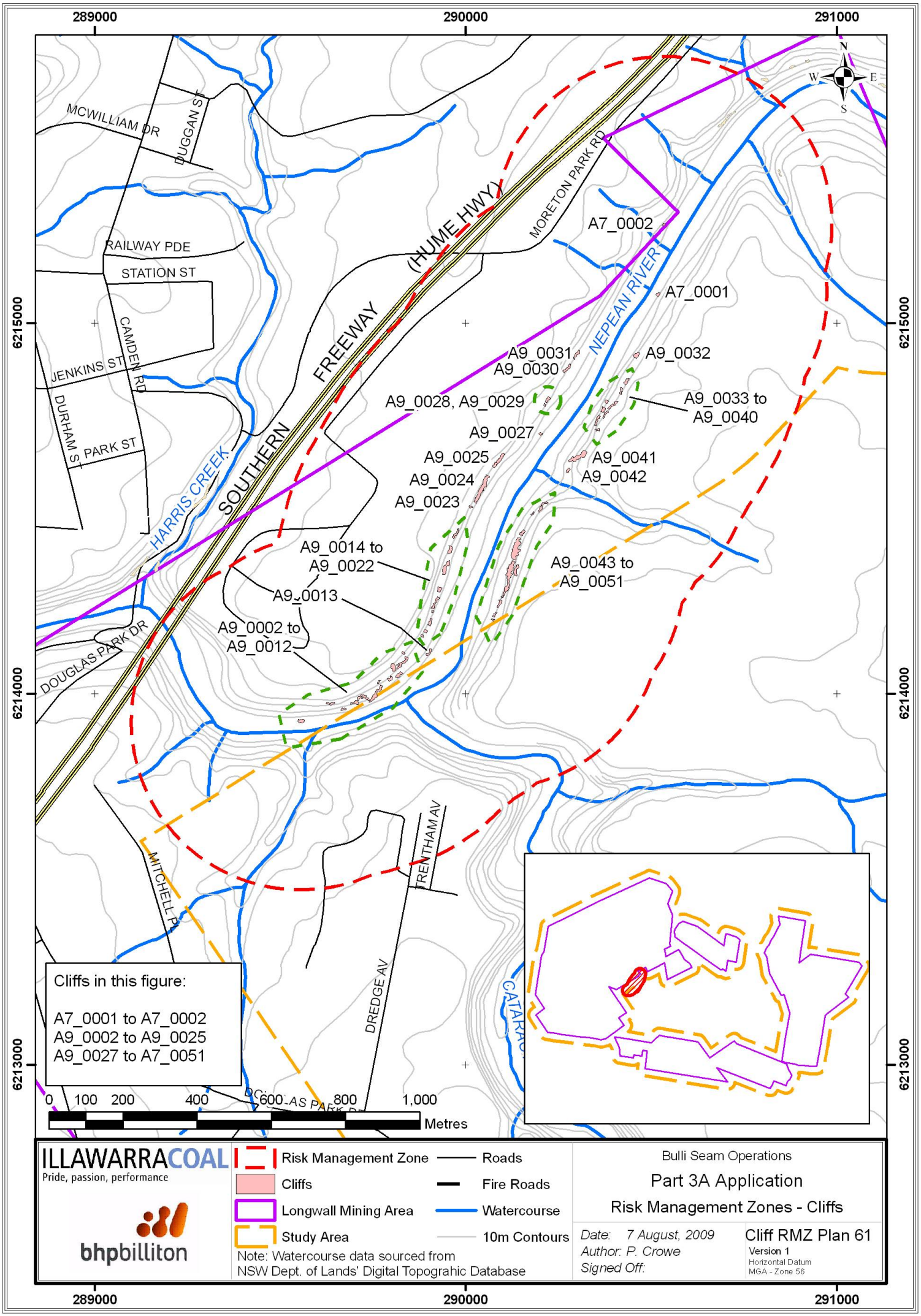

288000
289000
6212000
6211000
ALLENS CREEK
CLEMENTS CREEK
N
W
E
S
140
160
130
120
170
180
A8_0460
A8_0470
A8_0480
A8_0500
A8_0510
A8_0520
A8_0490
A8_0530
A8_0540
A8_0550
A8_0560
A8_0570
Cliffs in this figure:
A8_0460 A8_0520
A8_0470 A8_0530
A8_0480 A8_0540
A8_0490 A8_0550
A8_0500 A8_0560
A8_0510 A8_0570
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 5 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 56
Version 1
Horizontal Datum
MGA - Zone 56

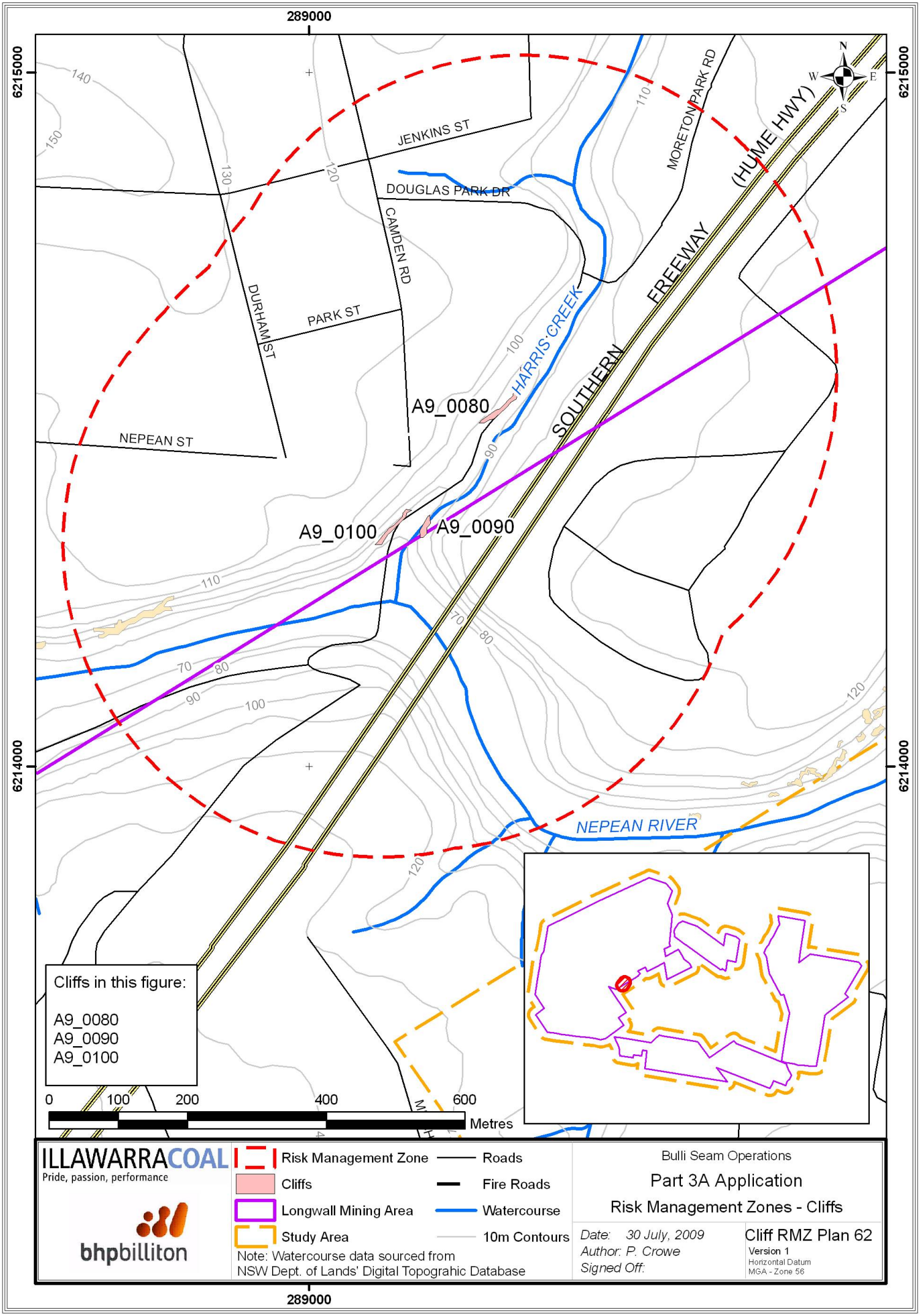

288000
6211000
6210000
N
W
E
S
130
140
180
160
150
170
200
190
ALLENS CREEK
A8_0580
A8_0590
Cliffs in this figure:
A8_0580
A8_0590
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 57
Version 1
Horizontal Datum
MGA - Zone 56

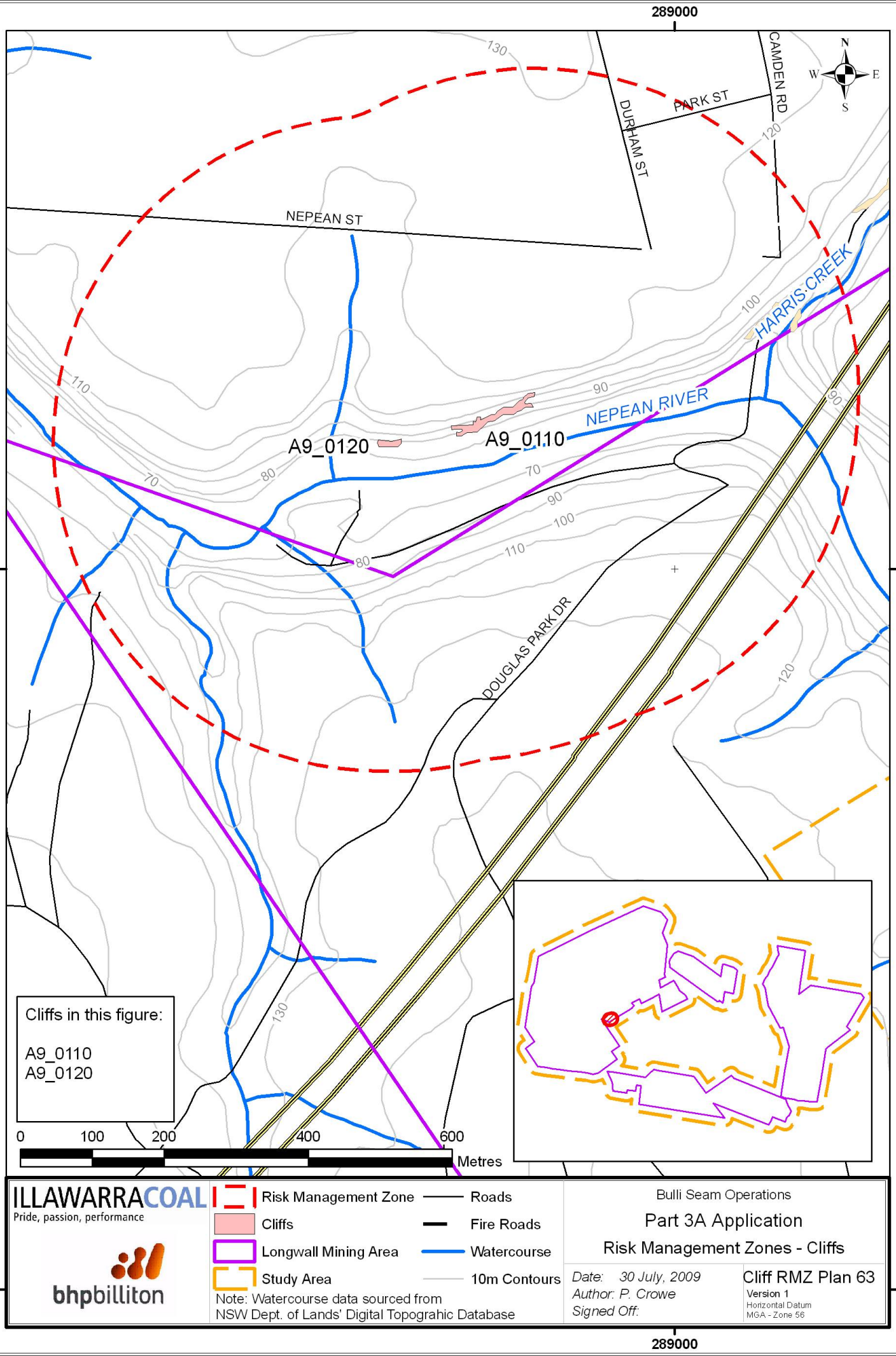

288000
6211000
6210000
N
W
E
S
130
170
180
150
140
160
CLEMENTS CREEK
ALLENS CREEK
A8_0610
A8_0600
Cliffs in this figure:
A8_0600
A8_0610
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Cliffs
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 58
Version 1
Horizontal Datum
MGA - Zone 56

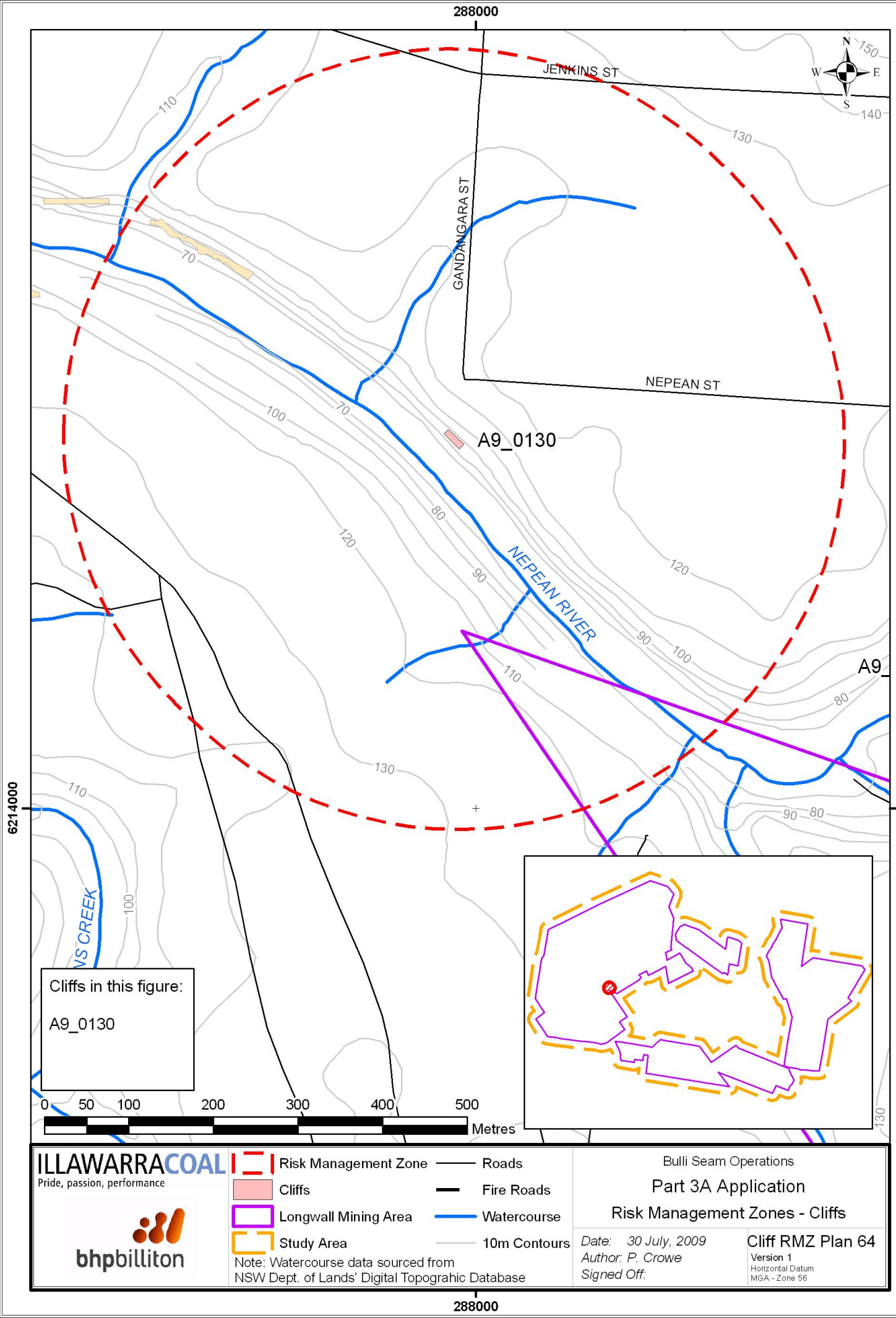

288000
6210000
180
160
150
170
140
N
W
E
S
A8_0620
Cliffs in this figure:
A8_0620
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 59
Version 1
Horizontal Datum
MGA - Zone 56

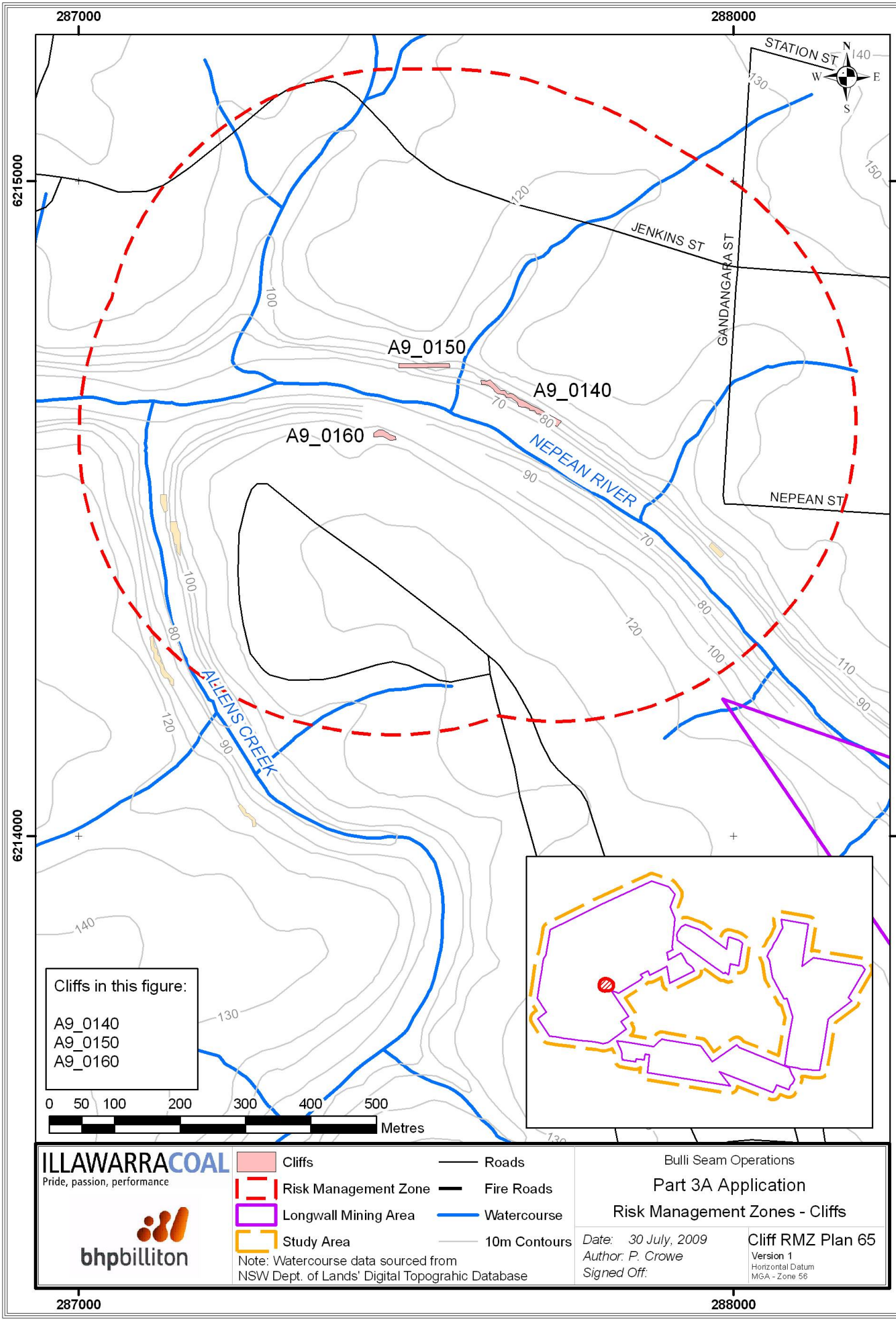

289000
290000
6211000
6210000
CLEMENTS CREEK
SANDY GULLY
THIRD POINT CREEK
ASHWO
A8_0700
A8_0710
A8_0690
A8_0670
A8_0680
A8_0720
A8_0730
180
170
150
140
160
190
N
S
E
W
0 50 100 200 300 400 500
Metres
Cliffs in this figure:
A8_0670
A8_0680
A8_0690
A8_0700
A8_0710
A8_0720
A8_0730
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 60
Version 1
Horizontal Datum
MGA - Zone 56

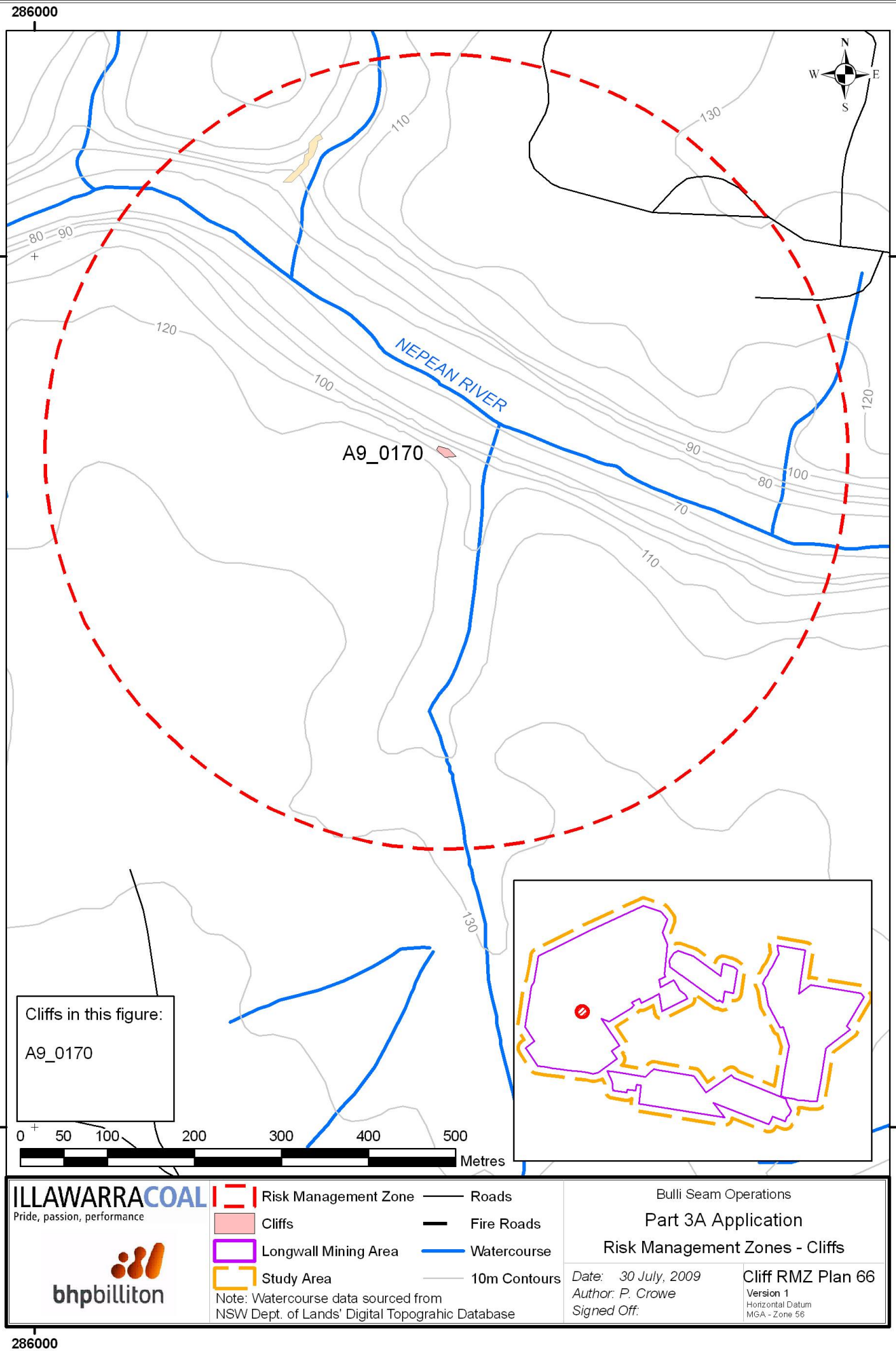

289000
290000
291000
6215000
6214000
6213000
N
W
E
S
MCWILLIAM DR
DUGGAN ST
RAILWAY PDE
STATION ST
CAMDEN RD
JENKINS ST
DURHAM ST
PARK ST
HARRIS CREEK
SOUTHERN FREEWAY (HUME HWY)
MORETON PARK RD
NEPEAN RIVER
DOUGLAS PARK DR
MITCHELL PL
TRENTHAM AV
DREDGE AV
CATARACT
A7_0002
A7_0001
A9_0031
A9_0030
A9_0032
A9_0028, A9_0029
A9_0033 to A9_0040
A9_0027
A9_0025
A9_0024
A9_0023
A9_0041
A9_0042
A9_0014 to A9_0022
A9_0013
A9_0002 to A9_0012
A9_0043 to A9_0051
Cliffs in this figure:
A7_0001 to A7_0002
A9_0002 to A9_0025
A9_0027 to A7_0051
0 100 200 400 600 800 1,000
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 7 August, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 61
Version 1
Horizontal Datum
MGA - Zone 56

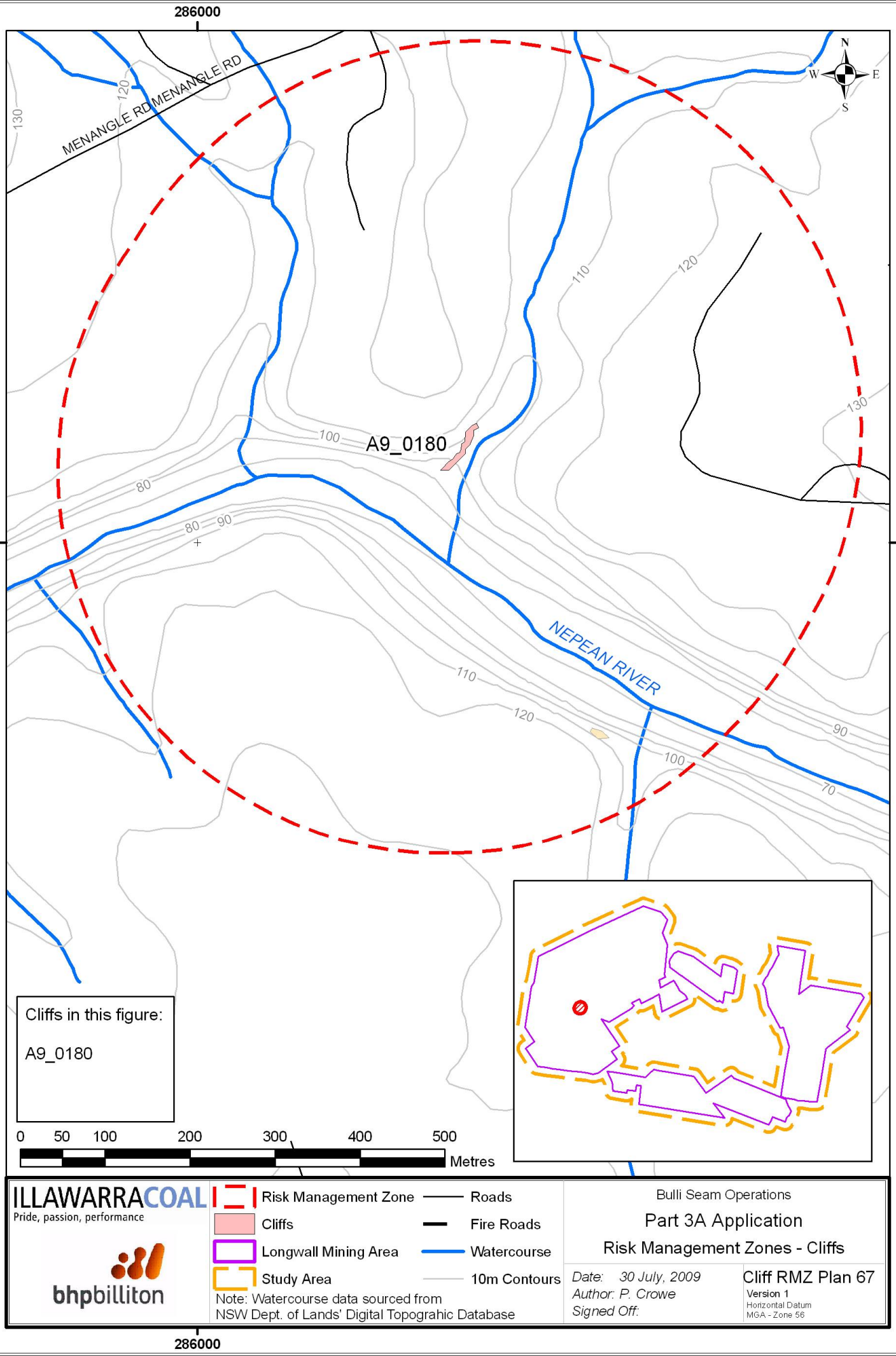

289000
6215000
6214000
JENKINS ST
DOUGLAS PARK DR
CAMDEN RD
DURHAM ST
PARK ST
NEPEAN ST
MORETON PARK RD
(HUME HWY)
FREEWAY
SOUTHERN
HARRIS CREEK
NEPEAN RIVER
A9_0080
A9_0090
A9_0100
N
S
E
W
Cliffs in this figure:
A9_0080
A9_0090
A9_0100
0
100
200
400
600
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 62
Version 1
Horizontal Datum
MGA - Zone 56

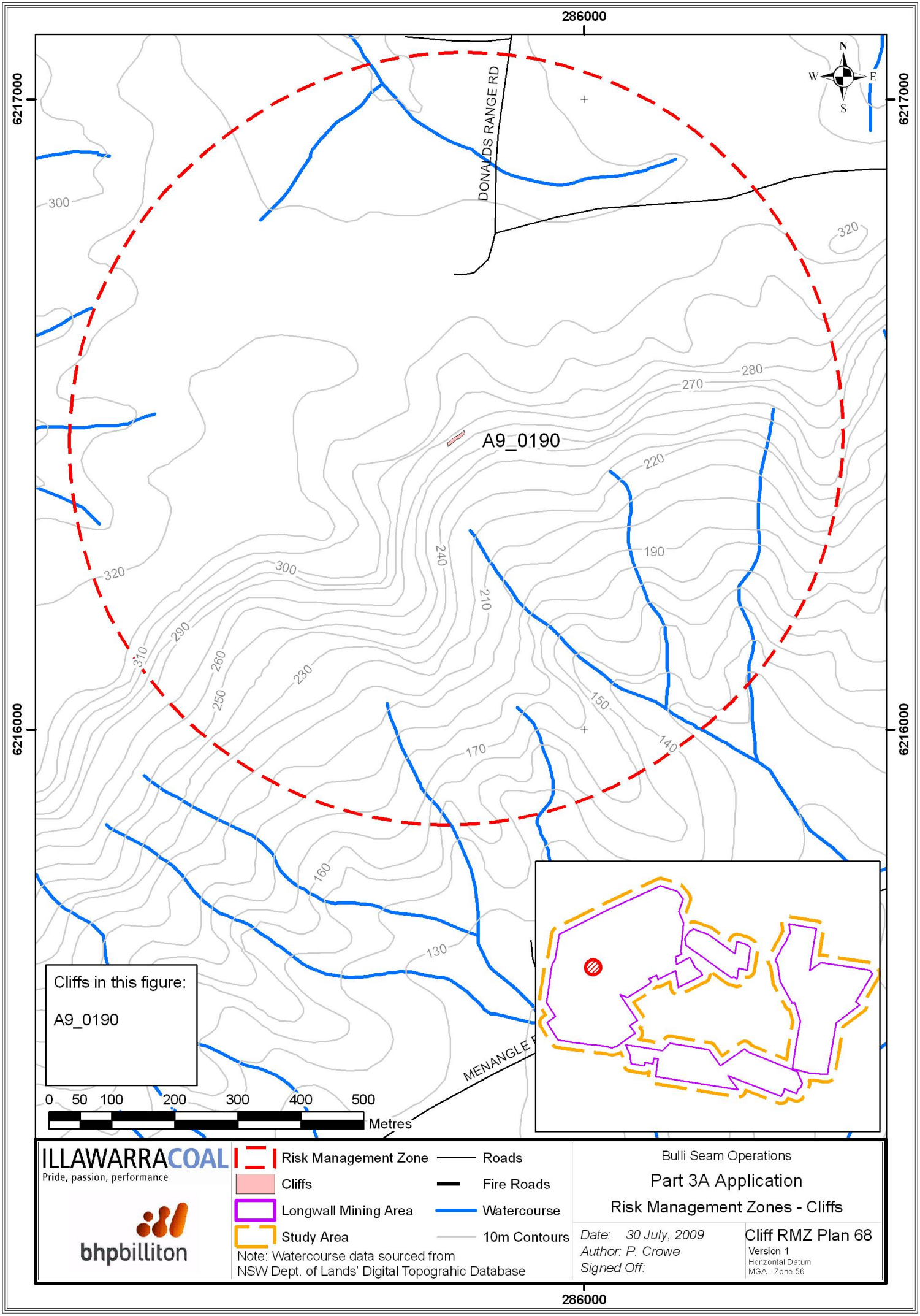

289000
6214000
6213000
NEPEAN ST
PARK ST
DURHAM ST
CAMDEN RD
HARRIS CREEK
NEPEAN RIVER
DOUGLAS PARK DR
A9_0120
A9_0110
130
120
110
100
90
80
70
N
S
E
W
Cliffs in this figure:
A9_0110
A9_0120
0
100
200
400
600
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 63
Version 1
Horizontal Datum
MGA - Zone 56

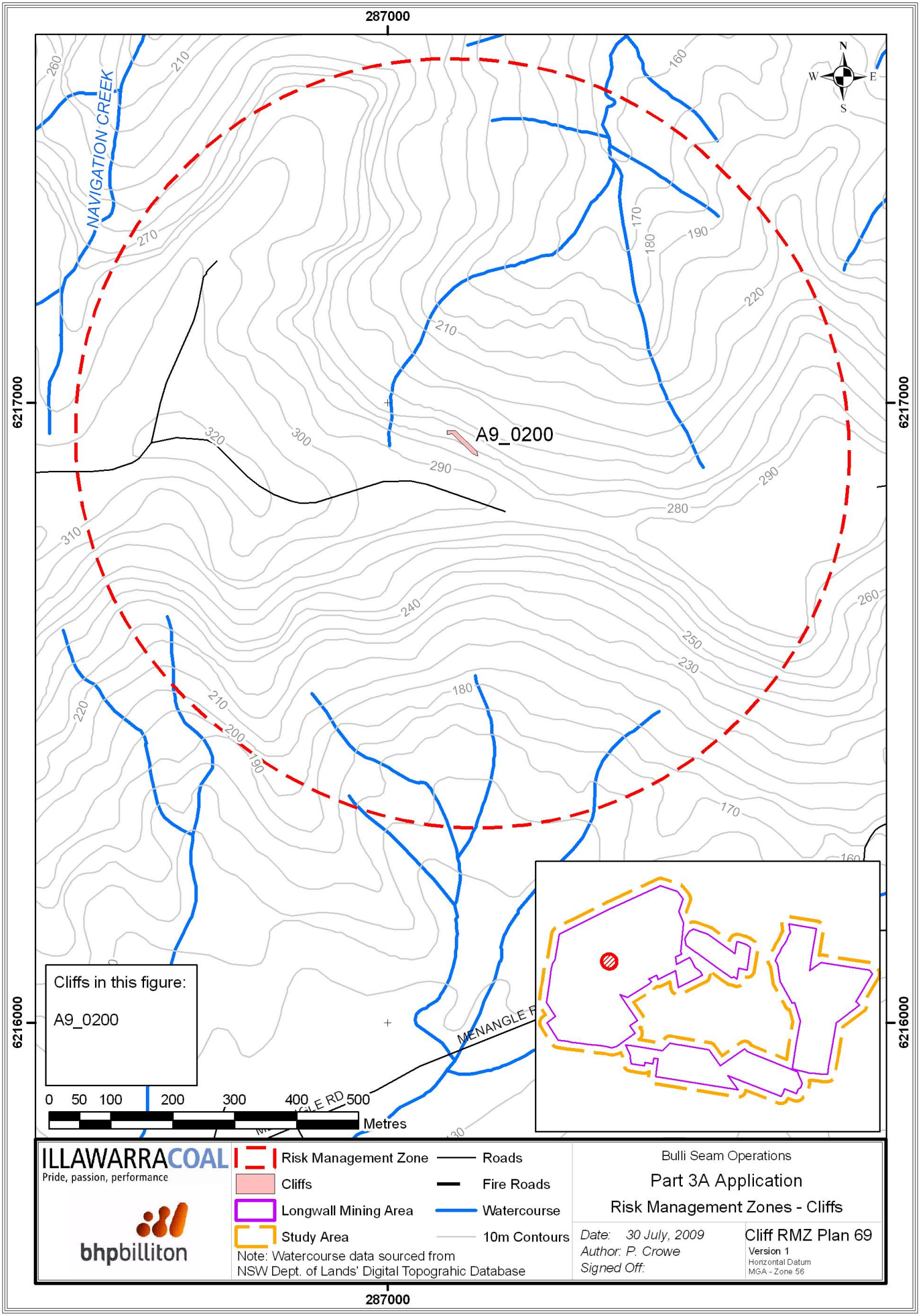

288000
JENKINS ST
GANDANGARA ST
NEPEAN ST
NEPEAN RIVER
A9_0130
A9_
6214000
N
S
E
W
150
140
130
120
110
100
90
80
70
Cliffs in this figure:
A9_0130
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 64
Version 1
Horizontal Datum
MGA - Zone 56


287000
288000
6215000
6214000
STATION ST
JENKINS ST
GANDANGARA ST
NEPEAN ST
NEPEAN RIVER
ALLENS CREEK
A9_0150
A9_0140
A9_0160
N
S
E
W
Cliffs in this figure:
A9_0140
A9_0150
A9_0160
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Cliffs
Risk Management Zone
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 65
Version 1
Horizontal Datum
MGA - Zone 56


286000
6215000
6214000
N
W
E
S
110
130
80
90
120
100
NEPEAN RIVER
A9_0170
70
Cliffs in this figure:
A9_0170
0
50
100
200
300
400
500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 66
Version 1
Horizontal Datum
MGA - Zone 56


286000
6215000
MENANGLE RD
MENANGLE RD
A9_0180
NEPEAN RIVER
N
S
E
W
130
120
110
100
90
80
70
Cliffs in this figure:
A9_0180
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 67
Version 1
Horizontal Datum
MGA - Zone 56


286000
6217000
6216000
DONALDS RANGE RD
N
W
E
S
A9_0190
300
320
280
270
220
190
240
210
290
260
250
230
310
150
140
170
160
130
MENANGLE
Cliffs in this figure:
A9_0190
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 68
Version 1
Horizontal Datum
MGA - Zone 56


287000
6217000
6216000
NAVIGATION CREEK
A9_0200
MENANGLE RD
N
S
E
W
Cliffs in this figure:
A9_0200
0 50 100 200 300 400 500
Metres
ILLAWARRACOAL
Pride, passion, performance
bhpbilliton
Risk Management Zone
Cliffs
Longwall Mining Area
Study Area
Roads
Fire Roads
Watercourse
10m Contours
Note: Watercourse data sourced from
NSW Dept. of Lands' Digital Topograhic Database
Bulli Seam Operations
Part 3A Application
Risk Management Zones - Cliffs
Date: 30 July, 2009
Author: P. Crowe
Signed Off:
Cliff RMZ Plan 69
Version 1
Horizontal Datum
MGA - Zone 56