

**BAAL BONE COLLIERY**  
**Subsidence Management Status Report**  
**LW 29 - 31**

**Four Monthly Update**

**REPORT No. 4**

**For the period:**  
**8<sup>th</sup> December 2008 to 7<sup>th</sup> April 2009**

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**Baal Bone Colliery**

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### FIGURES

Figures 1 & 2	Coxs River Swamp Groundwater Levels (2008/09)
Figure 3	Location of Groundwater Monitoring Piezometers

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## **1 INTRODUCTION**

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This Subsidence Status Management Report fulfils the requirements of Condition 19 of the Baal Bone Subsidence Management Plan (SMP) Longwalls 29 to 31 Approval Conditions. This is the fourth report and covers the period 7<sup>th</sup> December 2008 to 7<sup>th</sup> April 2009.

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## **2 PURPOSE AND SCOPE**

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The purpose of this document is to report the progress of mining, provide a summary of subsidence impacts, the implemented management processes and consultation with relevant stakeholders. It also provides the opportunity for relevant stakeholders to provide feedback as required under Condition 19.

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## **3 FACE POSITION OF THE LONGWALL**

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Longwall production in the SMP area has not commenced. Longwall 29 extraction is not scheduled to commence until early to mid June 2009.

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## **4 SUBSIDENCE MANAGEMENT ACTIONS**

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Subsidence management actions undertaken throughout the four month period are outlined below.

To date, no subsidence management actions are required as the longwall production in the SMP area has not commenced.

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## **5 CONSULTATION WITH STAKEHOLDERS**

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A Review Schedule was developed as part of the SMP application. The objective of the Review Schedule is to provide a process to ensure regular feedback regarding the management / monitoring undertaken for the SMP and to provide a mechanism for feedback from interested parties.

To comply with Condition 23 of the Subsidence Management Plan approval, an Aboriginal Heritage Management Plan has been prepared for a potential rock shelter site over Longwall 30. Following a meeting in Lithgow on the 27<sup>th</sup> September 2008 with relevant Aboriginal interest groups and representatives of the Department of Environment and Climate Change, Ozark Environmental and Heritage Management Pty Ltd prepared a draft Plan of Management.

This Draft document was circulated to the groups and the DECC for review and comment. The Plan was finalised in early December 2008 and has been submitted to the DECC.

Condition 15 of the Subsidence Management Plan approval required the development of a management plan for the Wolgan Escarpment. Details regarding this Plan are discussed in Section 6.1.1 below, however it is worth noting here that the Principal Subsidence Engineer, DPI Environmental Sustainability Branch and both the Department of Lands (Crown Lands Division) and Forests NSW (as landowners) have been consulted during its preparation.

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## **6 SUBSIDENCE DEVELOPMENT / OBSERVED SUBSIDENCE IMPACTS**

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### **6.1 Subsidence Impacts**

To date, there have been no subsidence impacts within the SMP area as longwall mining has not commenced.

#### **6.1.1 Wolgan Escarpment**

In accordance with Condition 15 of the SMP approval, Dr Ken Mills of SCT Operations Pty Ltd was commissioned by Baal Bone to prepare a thorough technical review of the mine layout, as contained within the SMP and to establish scientific confidence in the finish position of the panels and the width of LW31 in the vicinity of the two known pinch points. Ken undertook a detailed assessment of potential impacts based on previous data gathered at Baal Bone; and particularly in light of recent stress cell monitoring data collected during the extraction of LW26.

The results of this review and assessment (SCT Report BBO3432, dated 9 December 2008) indicates that a 30 metre reduction in the width of Longwall 31, down to 220 metres overall width, will ensure a higher level of confidence in the ability of the mine layout to protect the Wolgan Escarpment.

The Principal Subsidence Engineer has been consulted throughout the preparation of this report, as required by Condition 15(a), and has concurred with the recommendations contained therein. Baal Bone wishes to advise that it intends adopting these recommendations unreservedly and that a SMP Variation will be lodged at the appropriate juncture to address a reduction in panel width for LW31.

A comprehensive monitoring program is also included in the SCT report to provide subsidence monitoring, stress movement and stress change monitoring to detect any irregular movements to provide an early warning of an imminent rock fall. These aspects, including a trigger, action and response plan, are currently being incorporated into a revised Subsidence Monitoring Program for the LW29-31 SMP area (ref. Condition 12 of the SMP approval).

#### **6.1.2 Rock features**

To date there has been no subsidence impacts on rock features in the SMP area as mining has not yet commenced on these longwalls. No further action is currently required on rock features.

#### **6.1.3 Surface watercourses / Drainage structures**

To date there has been no subsidence impacts on surface watercourses or drainage structures in the SMP area as mining has not yet commenced on these longwalls.

In response to Condition 16 of the SMP approval, a Surface and Groundwater Response Strategy has been developed by Ian Forster of Connell Wagner. The draft Strategy was submitted to the Department of Primary Industries (DPI), Department of Water and Energy (DWE), the Sydney Catchment Authority (SCA), Department of Environment and Climate Change (DECC), Department of Lands and Forests NSW for comment. Comments were received from several organisations and the document was amended to include these comments.

The document has been finalised and has been submitted for approval to The Director, Environmental Sustainability, Department of Primary Industries.

#### **6.1.4 Fire Trails and Tracks**

To date there has been no subsidence impacts on any fire trails or tracks in the SMP area as mining has not yet commenced on these longwalls.

### **6.1.5 Swamp**

Baseline seasonal photographic monitoring of the Coxs River Swamp was undertaken on 16 December 2008 and again on 8 January 2009. The next round of seasonal photographic monitoring is scheduled for early April 2009.

### **6.1.6 Fauna**

*Biodiversity Monitoring Services* (formerly known as Mount King Ecological Surveys) completed the spring baseline seasonal survey in December 2008; with a 2008 summary report being submitted in March 2009.

In accordance with Condition 13 of the SMP approval an additional faunal monitoring site has been established in the Cox's River Swamp. Results and data from this site have been included in these latest reports.

These reports have concluded that there are now sufficient numbers and diversities of the fauna groups monitored to be able to calculate a set of diversity indices that form part of the baseline monitoring database. In addition, these factors can now be tracked over a number of years (2005 to 2008) and seasons to provide useful monitoring data to assess any changes in biodiversity values in the LW29-31 SMP Area.

It is now possible to assess any differences in the biodiversity and habitat condition of those sites sampling an area that will be subject to underground mining in the future. This comparison showed that there are no significant differences in the biodiversity and habitat complexity over the years.

The addition of a site within Long Swamp will assist in the overall assessment of the biodiversity values of the area. The site may be moved slightly next year to provide a better picture of fauna use in the swamp habitat.

The survey techniques used have been successful in locating a wide range of species, including new records for the Newnes Plateau region.

### **6.1.7 Flora**

*Gingra Ecological Surveys* have submitted their 2008 report seasonal monitoring report which summarises baseline monitoring completed during autumn and spring 2008.

This report concludes by stating that the vegetation monitoring has been conducted in a manner which allows assessment against a number of indicators which may provide evidence of an effect of subsidence. However changes in these indicators may also result from prevailing climatic conditions and other disturbances independent of mining such as bushfires, logging operations, recreational activities and feral animals.

It should be noted that gross species diversity records do not necessarily provide a clear indication of an effect of mining. Experience from other mines in the Lithgow area indicates that there is a seasonal response, with grasses, orchids and other ground layer plants being detected in spring, summer and autumn, but not winter. Periods of relatively low rainfall, such as that experienced in 2006 and for periods in 2007, including July to October, may result in a seasonal failure in growth of these groups of plants, leading to lower rates of species diversity than in seasons of average or above average rainfall.

The results for autumn and spring 2008 show that there is a response of species diversity to seasonal rainfall at Baal Bone. This is broadly consistent with observations across the Lithgow area.

There are more weed species present within Long Swamp, reflecting a history of disturbance and more suitable conditions for weed growth in the Long Swamp gully, as opposed to the low nutrient woodland soils elsewhere in the study area."

### 6.1.8 Underground water make

Data continues to be collected from the mines dewatering bores, flow meters and data loggers regarding mines water discharges and underground water storage levels. This data is currently being used to calibrate a mine water make model prior to commencement of extraction of LW 29.

### 6.1.9 Ground water

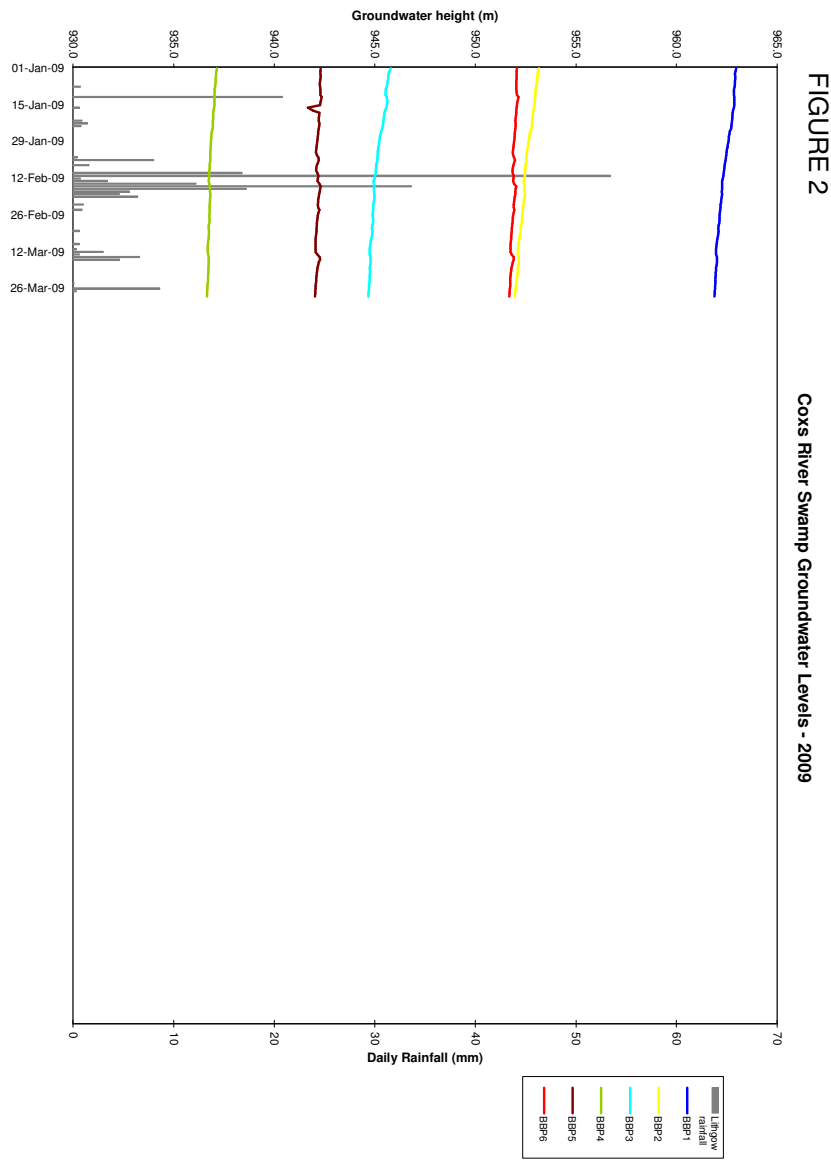
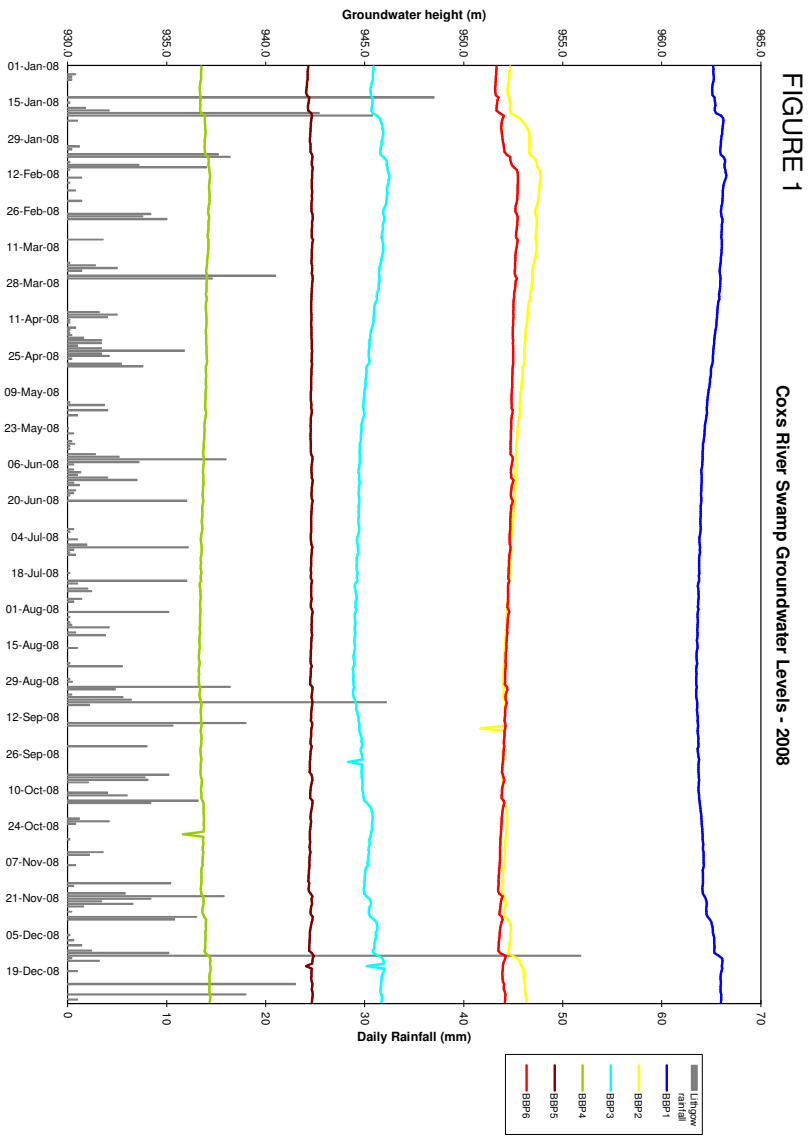
*Connell Wagner* monitors six piezometers on a bimonthly basis to gather baseline data regarding groundwater level fluctuations in the vicinity of the Coxs River Swamp. To date, the data obtained (shown in **Figures 1 & 2**) confirms a strong correlation between groundwater levels and prevailing climatic conditions; most particularly the relationship to rainfall.

Data collected on 22 January 2009 confirms that groundwater in all of the boreholes has risen since the last report. This is due to a significant rainfall event on 13th December. One or two smaller events at the end of November also raised the water level in some of the bores. The groundwater level behaviour is generally as expected given the climatic conditions.

There is no abnormal behaviour indicated in any of these data.

Data collected on 30 March 2009 confirms that groundwater levels in all of the bores showed a slight decline over the past two months. This is despite heavy rainfall at Lithgow in the middle of February. It is expected that the rainfall was not as heavy at the swamp, as the station on the plateau did not register as much rainfall as the Lithgow gauge. Nevertheless, there was a slight rise in level in some of the bores due to the February rainfall. The rainfall in March was well below average, so the decline in levels from mid-February is not surprising. As expected, the greatest fall in groundwater level was in the bores on the ridges, with only small falls in level in the swamp itself.

Baseline groundwater quality monitoring commenced in September 2008 and is currently being undertaken on a monthly basis. Results of monitoring to date does not indicate any anomalies with groundwater quality at any of the bore sites apart from slightly elevated iron levels at several of the bores.



## **6.2 Subsidence Development (Survey results summary)**

To date, there has been no subsidence development as longwall production in the SMP area has not commenced.

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## **7 ADEQUACY, QUALITY AND EFFECTIVENESS**

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The adequacy, quality, effectiveness of the implemented management processes based on compliance with approval conditions is considered to be satisfactory to date.

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## **8 PROPOSED ADDITIONAL / OUTSTANDING MANAGEMENT ACTIONS**

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To date, no additional management actions are required nor is there any need for early responses or emergency procedures to be undertaken as there have been no negative subsidence impacts due to the extraction of the subject longwalls.

Preparation / augmentation of several management plans and monitoring programs (as required by the Conditions of Approval) are ongoing. These management plans / programs are being developed in consultation with the relevant agency stakeholders. Approval of these documents will be received prior to the commencement of longwall mining.

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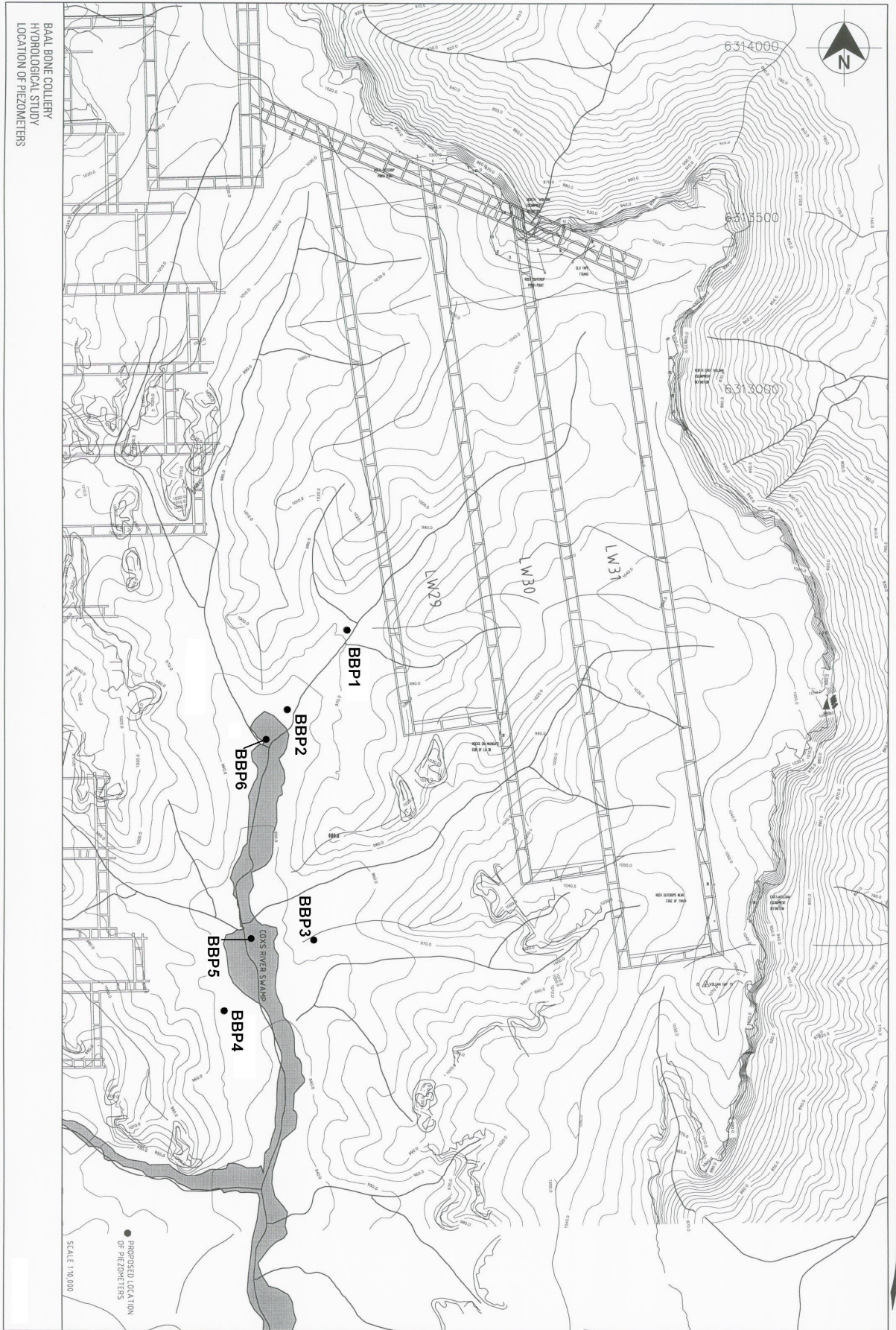
## **9 CONCLUSIONS**

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There is no requirement to instigate any additional actions as longwall mining of the SMP area has not commenced.

The review of existing and development of required Management Plans and programs is continuing to ensure compliance with the SMP Approval Conditions.





**FIGURE 3: Location of groundwater monitoring piezometers**