BAAL BONE COLLIERY
OPERATED BY THE WALLERAWANG COLLIERIES LIMITED

BAAL BONE COLLIERY
Subsidence Management Status Report
LW 29 - 31

Four Monthly Update

REPORT No. 7

For the period:
8th December 2009 to 7th April 2010

BAAL BONE COLLIERY
OPERATED BY THE WALLERAWANG COLLIERIES LIMITED

TABLE OF CONTENTS

FIGURES

1 INTRODUCTION

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 seventh report and covers the period 8th December 2009 to 7th April 2010.

2 PURPOSE AND SCOPE

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.

3 FACE POSITION OF THE LONGWALL

Longwall production in the first panel (LW29) of the new SMP area commenced on 6 July 2009. The first goaf fall was recorded on 13 July 2009 at which time the face had retreated 18m.

During the reporting period the faceline has retreated 432m, from chainage 438 to chainage 6m. As of 7 April 2010, the faceline of LW29 has retreated a total of 1456m.

4 SUMMARY OF SUBSIDENCE MANAGEMENT ACTIONS

Subsidence management actions undertaken throughout this reporting period are outlined below.

1. Continuation of weekly surface inspections.
2. Continuation of ongoing flora, fauna and groundwater quality monitoring programs.
3. Routine monitoring of groundwater piezometer levels.
4. Seasonal photographic monitoring of swamp vegetation at BBP5 and BBP6.
5. Establishment and pre-mining survey of of H-H, I-I and J-J subsidence survey lines around northern and southern pinch points; **Figures 1C & 1D**.
6. Establishment and pre-mining survey of scattered arrays at both northern and southern pinch points; **Figures 1C & 1D**.
7. Erection of additional warning signs around the perimeter of the mining area and at strategic points along the various forest tracks that traverse the SMP area; due to loss of signs by theft.

5 CONSULTATION WITH STAKEHOLDERS

There has been no need or requirement to undertake formal consultation with stakeholders during this reporting period.

6 SUBSIDENCE DEVELOPMENT, OBSERVED SUBSIDENCE IMPACTS & MONITORING RESULTS

6.1 Surface Subsidence Impacts

At the end of the reporting period the LW29 face has retreated a total of 1456m and was approximately 6m from the end of the panel. Some tension cracking as predicted has appeared parallel to the gateroads and across the centre of the panel.

Due to the proximity of an informal motor cycle track through the Forest, several cracks across the centre of the panel were filled manually (with pick and shovel) in the interests of public safety. These areas were also identified with barrier tape and additional signage was placed at numerous points along the track; including at all entry points off the main access roads.

Routine follow up surface inspections also identified an area immediately above a steep hill slope where downslope creep had continued to occur for an extended period following the initial goaf fall. Even though the systematic horizontal movement was within the predicted range, the crack was once again filled in the interests of public safety.

There has been no subsidence impacts observed outside the nominated angle of draw.

6.1.1 Wolgan Escarpment

Stress change monitoring instruments have been installed and commissioned in the vicinity of the two pinch points on LW31. Stress changes in the rock strata are being monitored using a remote logger as Longwalls 29, 30 and 31 are progressively extracted. Stress cells are logged on a twice daily cycle and information downloaded periodically for analysis by SCT Operations.

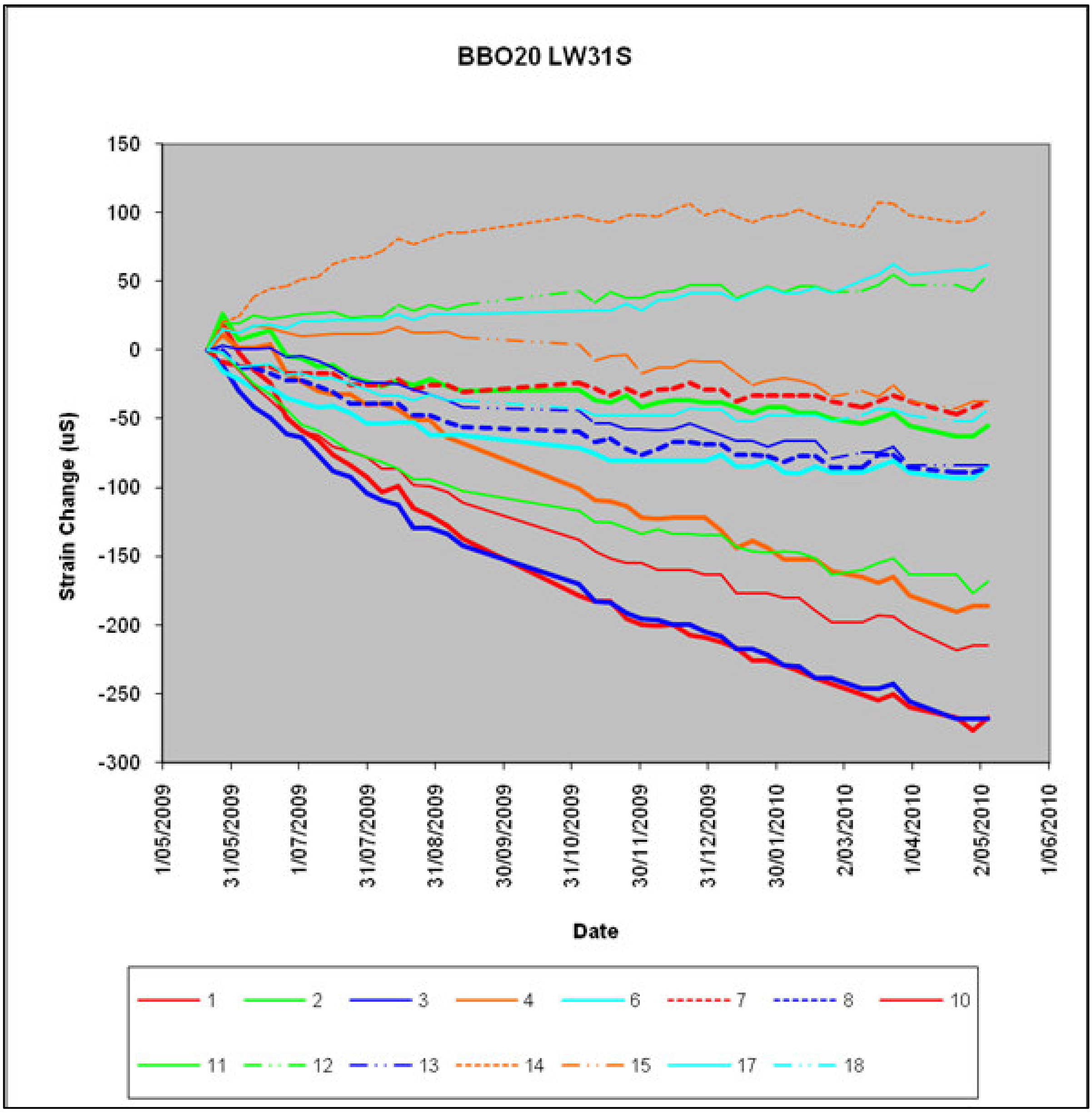
Analysis of the overcoring of BBO22 indicates that the major horizontal stress at the northern site is oriented at approximately 340°GN and has a magnitude of about 2.4MPa at the northern site. The minor horizontal stress is oriented at right angles with a magnitude of less than 0.5MPa. These alignments are consistent with the pressure test results for BBO22 and BBO23, both of which indicate the major horizontal stress is oriented at around 330-340°GN.

A major stress alignment of 330-340°GN fits with the regional joint set and with only low levels of horizontal stress toward the escarpment, consistent with the general geometry. The regional stress direction is typically oriented east of north, so there appears to have been a rotation of the stress direction from the regional direction at the northern monitoring site, most probably as a result of the presence of the escarpment.

The pressure test on BBO20 (the southern monitoring site) indicates that the major stress direction is oriented at about 30°GN, so this is more consistent with regional trends.

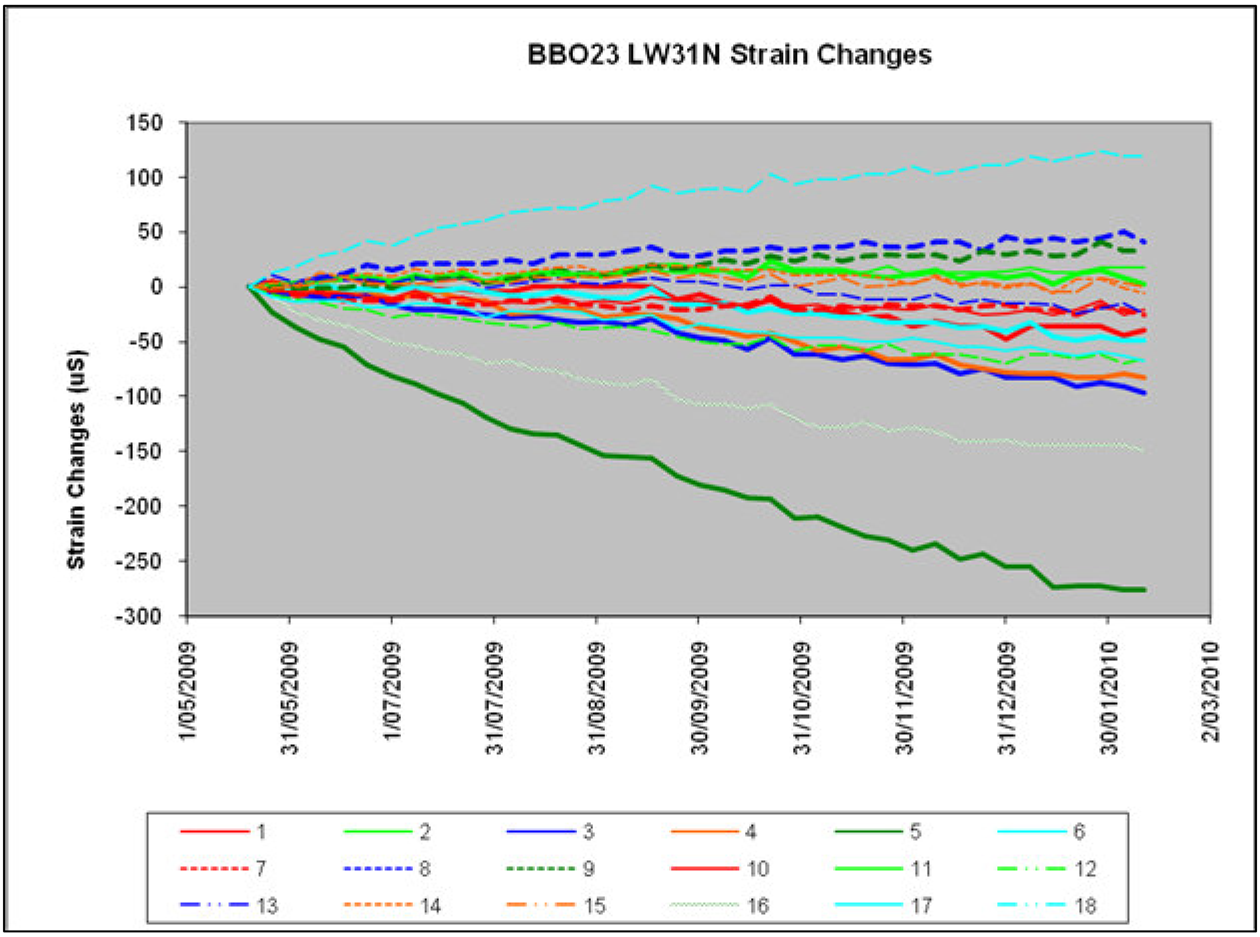
Monitoring at BBO20 shows a steady change in strain with time at 41m below the surface. There does not appear to be any significant effect from mining Longwall 29 evident in the monitoring results. The drift toward compression strains is mainly evident in the circumferential gauges and this low level creep appears to be a characteristic of the coarse grained sandstone in which the instrument is installed.

Analysis of the strain changes observed indicates stress changes that are generally less than the tolerance of the measurements (based on 95% confidence limits) and of the order of 0.6-0.8MPa in compression. These changes are interpreted as being associated with rock creep around the borehole rather than changes associated with mining activity.



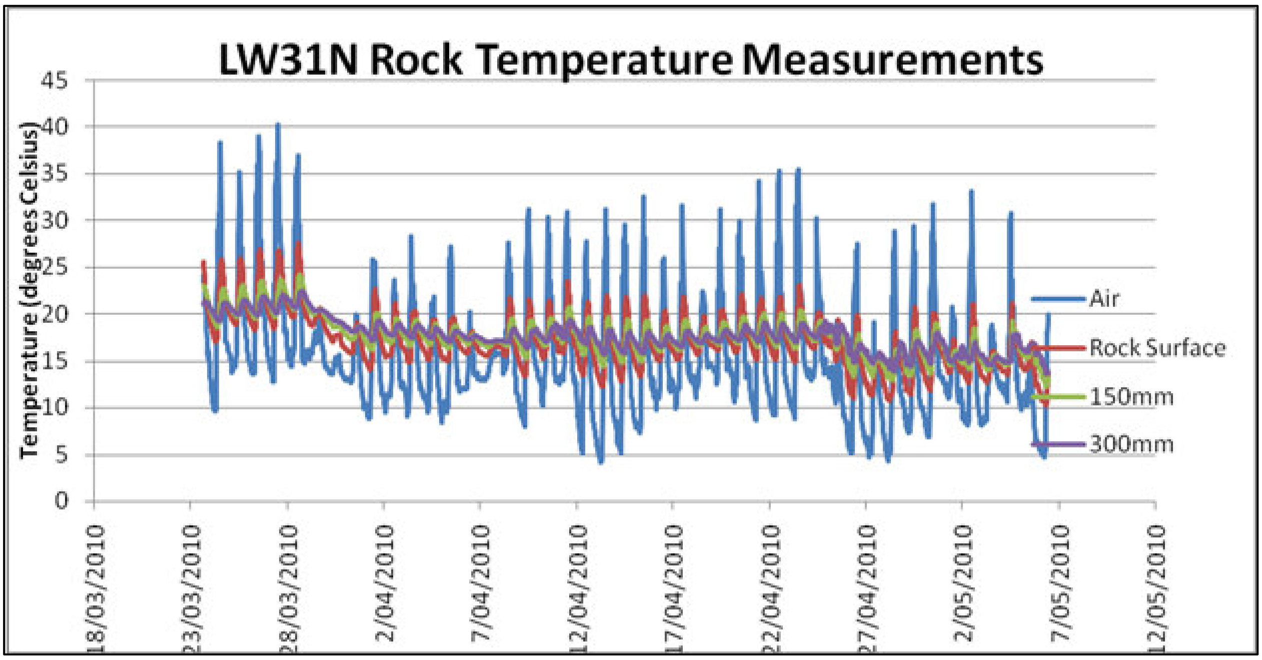
Monitoring at BBO23 shows a steady change in strain with time at 43m below the surface, at least until 10 February 2010, the time of the last successful download. There does not appear to be any significant effect from mining Longwall 29 evident in the monitoring results. The drift toward compression strains is mainly evident in the circumferential gauges and, as with BBO20, this low level creep appears to be a characteristic of the coarse grained sandstone in which the instrument is installed.

Analysis of the strain changes observed indicates stress changes that have generally tighter correlation than BBO20, with the stress changes indicated as increasing by about 1MPa in a 330°GN direction and 0.2MPa in an orthogonal direction. These changes are interpreted as being associated with rock creep around the borehole under the influence of the background stress rather than changes associated with mining activity because there doesn't appear to be any correlation with the start of mining or any pauses in mining activity as Longwall 29 retreated.



A temperature monitoring probe capable of measuring the air temperature, rock temperature at the rock surface, 150mm below the surface, and 300mm below the surface was installed in February and has been recording temperatures at 30 minute intervals. The buffer filled up and has wrapped around but the data set is sufficiently large to show the trends over an extended period. The air temperature varies 5℃ to 40℃ over the monitoring period. The rock surface varies daily about 10℃ and over the monitoring period by approximately 20℃. At 150mm below the surface, the rock temperature variation on a daily basis is about 5℃ with a change over the period of monitoring of about 12℃. At 300mm below the surface, the rock temperature has varied about 2℃ on a daily basis and 10℃ over the monitoring period.

The thermal expansion coefficient of the sandstone at Baal Bone has not been measured, but sandstone generally has a thermal coefficient of expansion of about 10uS / ℃. This means that for a daily 10℃ change in rock temperature, the surface strains/stresses in the rock are cycling through about 80uS or 0.7MPa. These surface stresses are of a similar magnitude to the stresses measured as creep around the borehole 40+m below the surface. The implication is that the rock that forms the Wolgan Escarpment is currently experiencing 1-3MPa change in surface stress as a result of seasonal temperature changes and 0.7MPa on a daily basis. Accordingly, there is a fair bit of cyclic loading going on in the near surface rock without any mining influence.


LW31N Rock Temperature Measurements
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40
35
30
25
20
15
10
5
0
18/03/2010
23/03/2010
28/03/2010
2/04/2010
7/04/2010
12/04/2010
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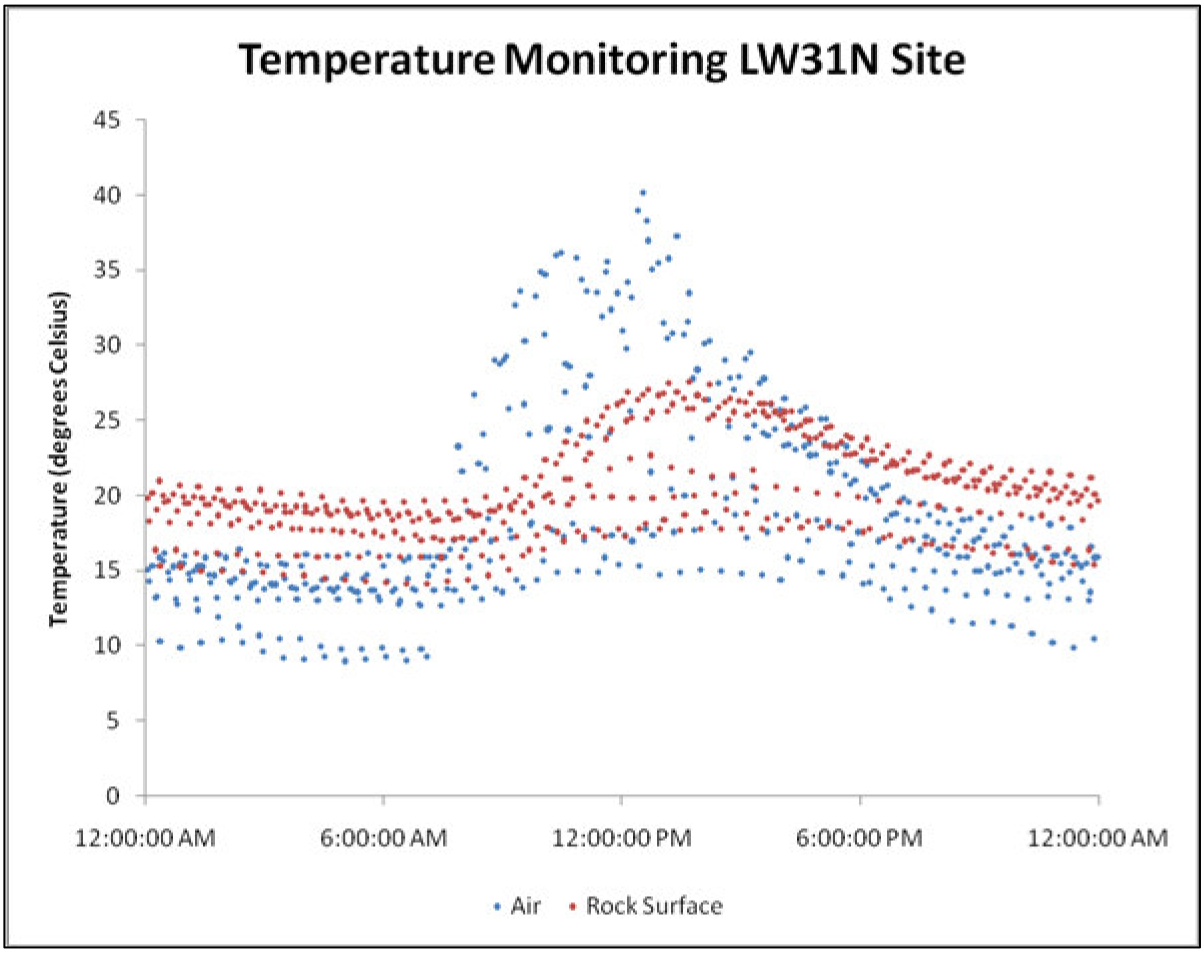
Air
Rock Surface
150mm
300mm


Temperature Monitoring LW31N Site
Temperature (degrees Celsius)
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35
30
25
20
15
10
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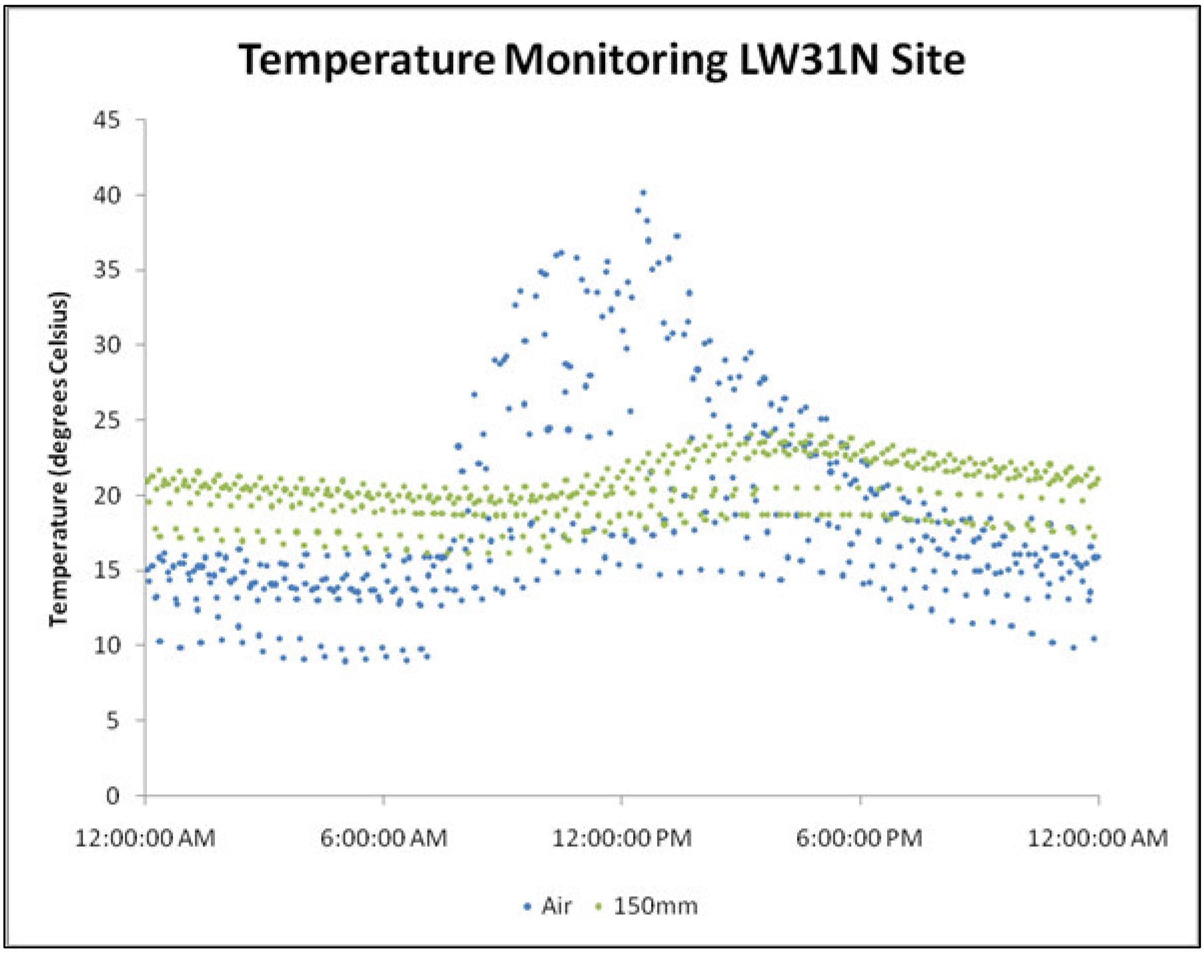
Air
Rock Surface


Temperature Monitoring LW31N Site
Temperature (degrees Celsius)
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40
35
30
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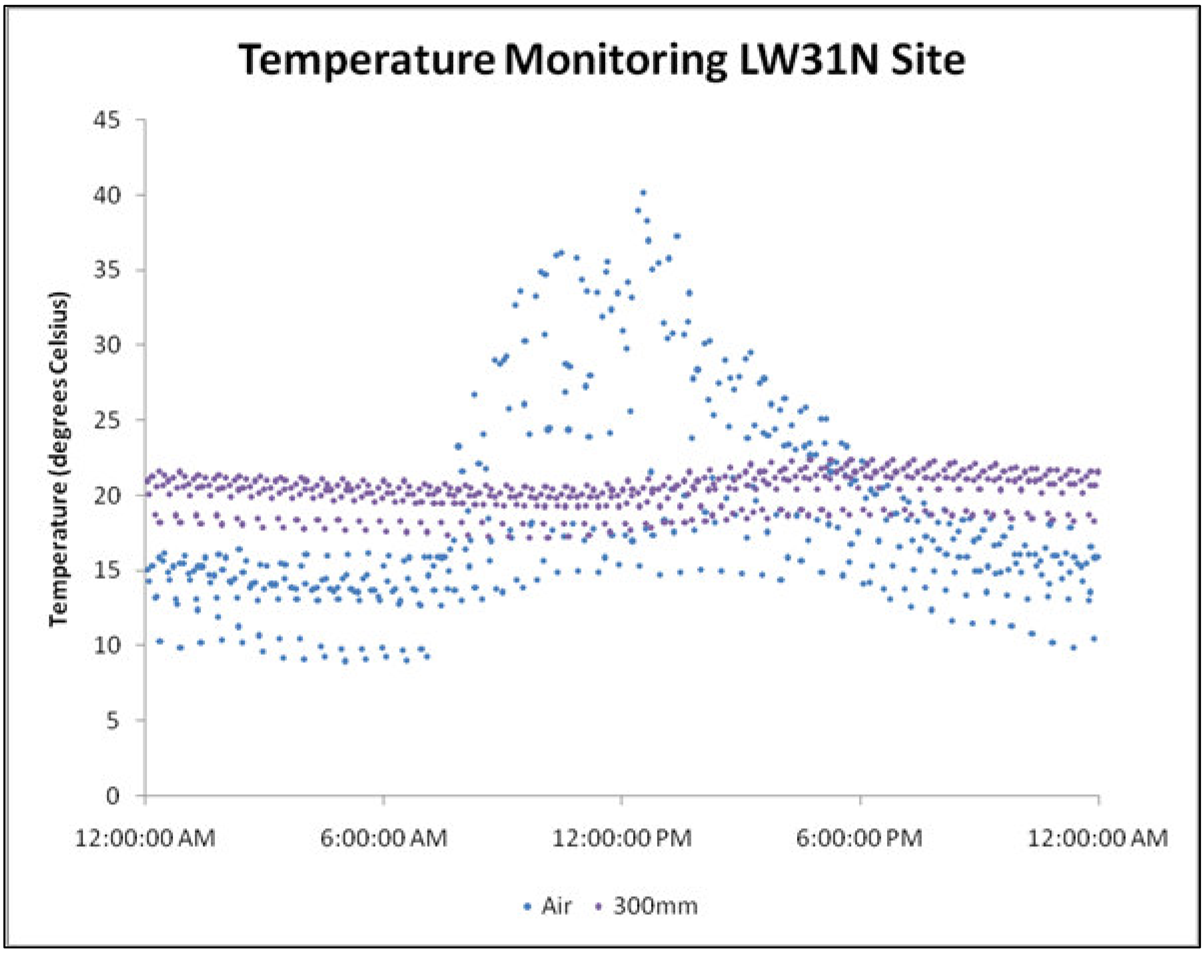
Air
150mm



6.1.2 Rock Features

To date there has been no adverse or unpredicted subsidence impacts on identified rock features in the vicinity of the SMP area.

6.1.3 Surface Drainage Depressions

To date there has been no unpredicted subsidence impacts observed on surface drainage depressions within the SMP area. Some minor fractures, within predicted ranges and below TARP trigger values as identified in the SMP Environmental Monitoring Program, have been identified.

Inspections of the area during or immediately following runoff producing rainfall events (ie. 25mm / 24 hour period) has continued during longwall mining; there has been no observable change to pre-mining flow characteristics and/or stream morphology.

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; ongoing weekly inspections are continuing.

6.1.5 Swamp

Baseline seasonal photographic monitoring of the Coxs River Swamp was undertaken on 19 March 2010. Seasonal variations in swamp appearance are consistent with those observed during pre-mining assessments, particularly when antecedent ground moisture levels are taken into consideration. These observations are confirmed by the results of the seasonal flora and fauna monitoring programs.

The next round of seasonal photographic monitoring is scheduled for June 2010.

6.1.6 Fauna

In early March 2010, Biodiversity Monitoring Services submitted a full analysis of the 2009 data in their report, *Fauna monitoring during 2009 within the LW29-31 Subsidence Management Plan Application Area at Baal Bone Colliery (February 2010)*.

A total of 22 native mammal (five introduced), 55 bird, nine reptile and five amphibian species have been located within or near Longwall 29-31 SMP Area at Baal Bone Colliery during 2009. The number of bird, native mammal and reptile species located in 2009 was slightly higher than in earlier years. As expected with continued surveys, the number of species located within the SMP area has increased over the years. Changes in species richness and cumulative curves for new species between 2005 and 2009 are shown in Figures below. It is expected that the number of new species located each year will continue to increase and finally level out. Then the final overall species richness can be calculated from the final slope of the asymptote.

New species located during 2009 are a number of bats (Little Pied Bat, Gould's Wattled Bat, Chocolate Wattled Bat, False Pipistrelle, Eastern Bent-wing Bat, Greater Broad-nosed Bat, Little Forest Bat and Southern Forest Bat), the Long-nosed Bandicoot, Feral Pig, Peregrine Falcon, Masked Lapwing, Weebill, Varied Sitella, Satin Flycatcher, Yellow-tufted Honeyeater, Rufous Fantail, Mountain Heath Dragon and the Striped Marsh Frog.

Figure 6.1.6a: Species Richness over Time for the three Major Faunal Groups

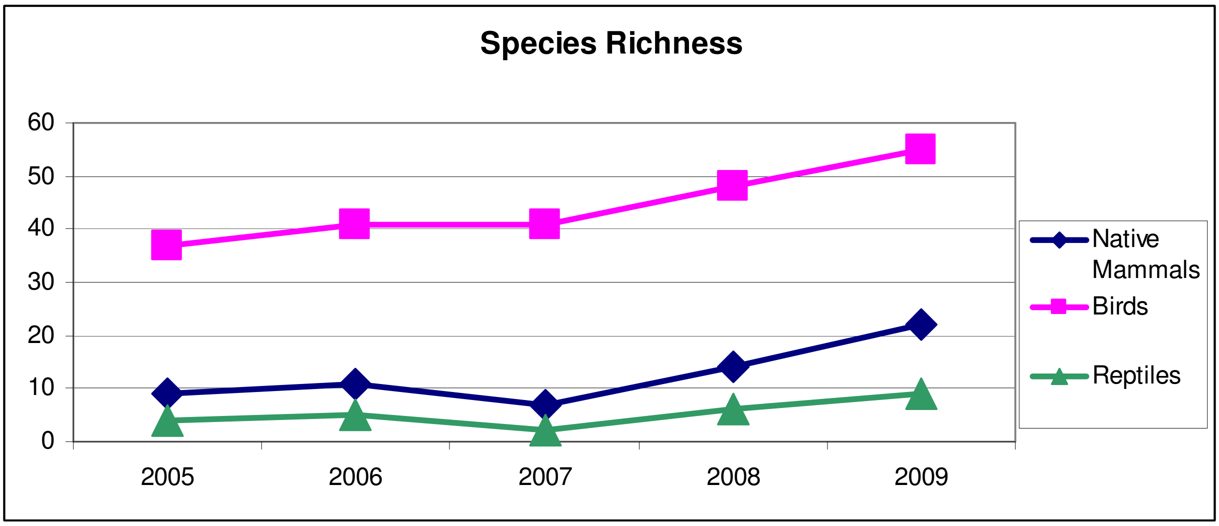
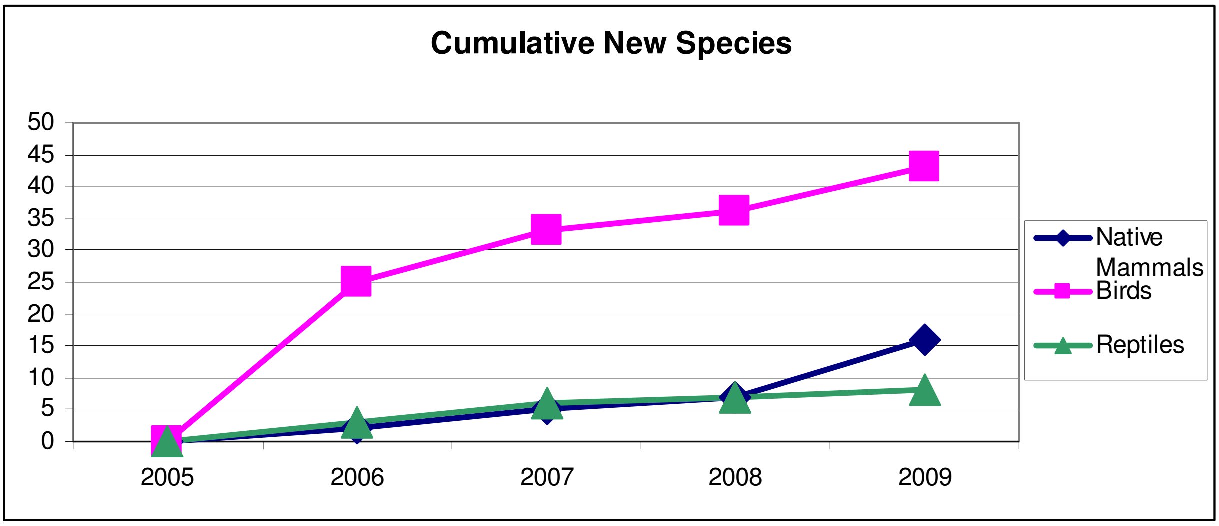


Figure 6.1.6b: Number of new species located since 2005



The number of species within each faunal group provides an index of its biodiversity; the higher the species richness, the higher the biodiversity. A high biodiversity index indicates an area containing a variety of natural habitats in good condition. The species richness values for the three surveys during 2009 are given in the Table below, together with the overall species richness for 2005 to 2007. The values for Species Richness are also presented graphically above.

A non-parametric Kruskal-Wallis One Way Analysis of Variance on Ranks shows that there are no statistical differences between the species richness values over the five years.

TABLE 6.1.6a: Species Richness of the Three Main Faunal Groups

Species Richness	Autumn 2009	Spring 2009	Summer 2009	Overall 2009	Overall 2008	Overall 2007	Overall 2006	Overall 2005
Birds	30	51	16	55	48	41	41	37
Native Mammals	9	19	3	22	14	7 (no bats)	11	9
Reptiles	0	7	2	9	6	2	5	4

The Simpson's Index of Diversity combines species richness and individual numbers to provide a better indication of biodiversity. The closer the index is to one, the higher the biodiversity and, by implication, the better the area for fauna. Simpson's Index of Diversity and Evenness for birds and native mammals are given in the Table below (note: there is insufficient data to analyse reptile numbers).

Simpson's Indexes of Diversity for birds has stayed relatively constant between 2005 and 2009, but the index for native mammals has risen in the past four years. There is a relationship between the Simpson Index and evenness in mammals i.e. as evenness falls so does the Simpson's Index. High numbers of individuals of a particular species (e.g. Red-necked Wallabies in 2006) will result in such a pattern. Overall there are no significant differences in the diversity indices over the years (ANOVA).

Figure 6.1.6c: Simpson's Index of Diversity Between 2005 and 2009

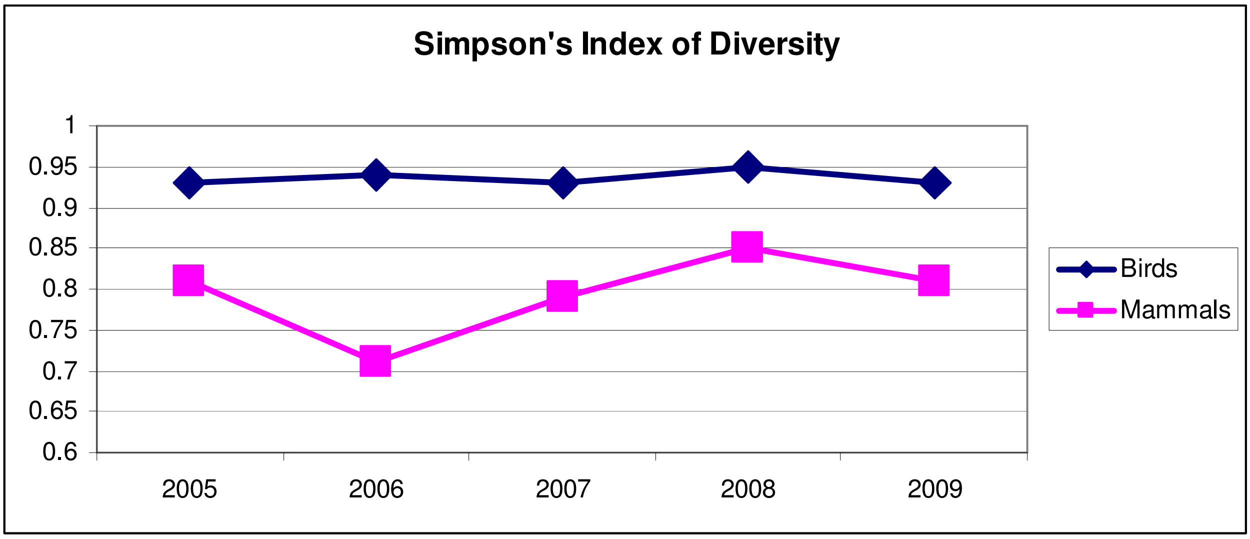
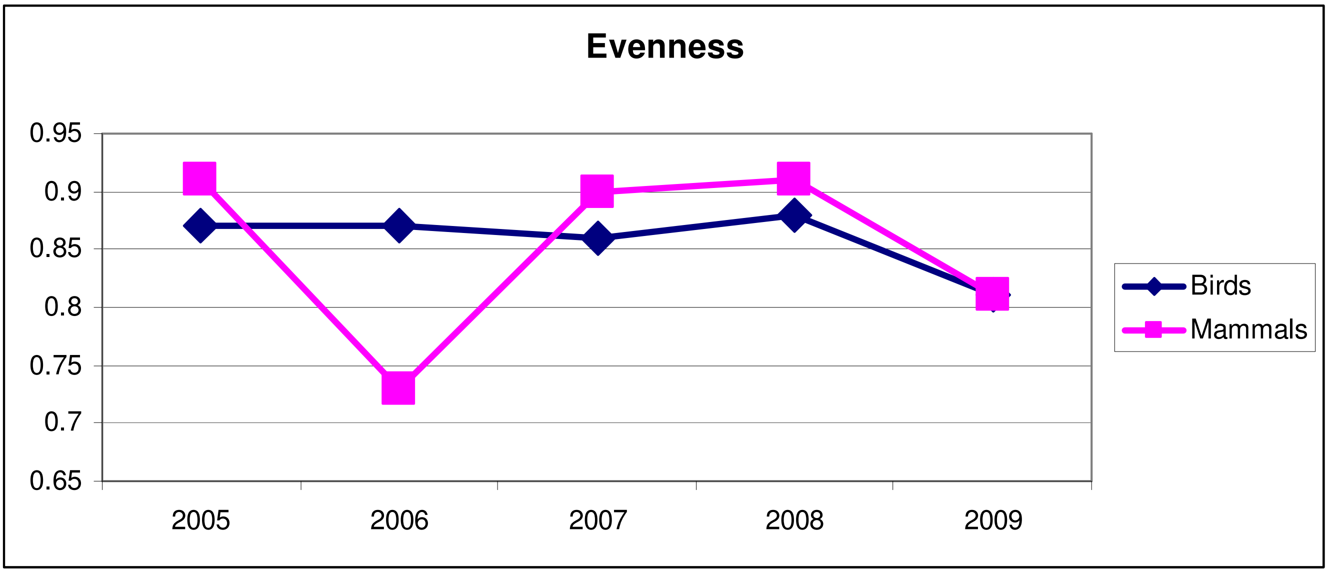


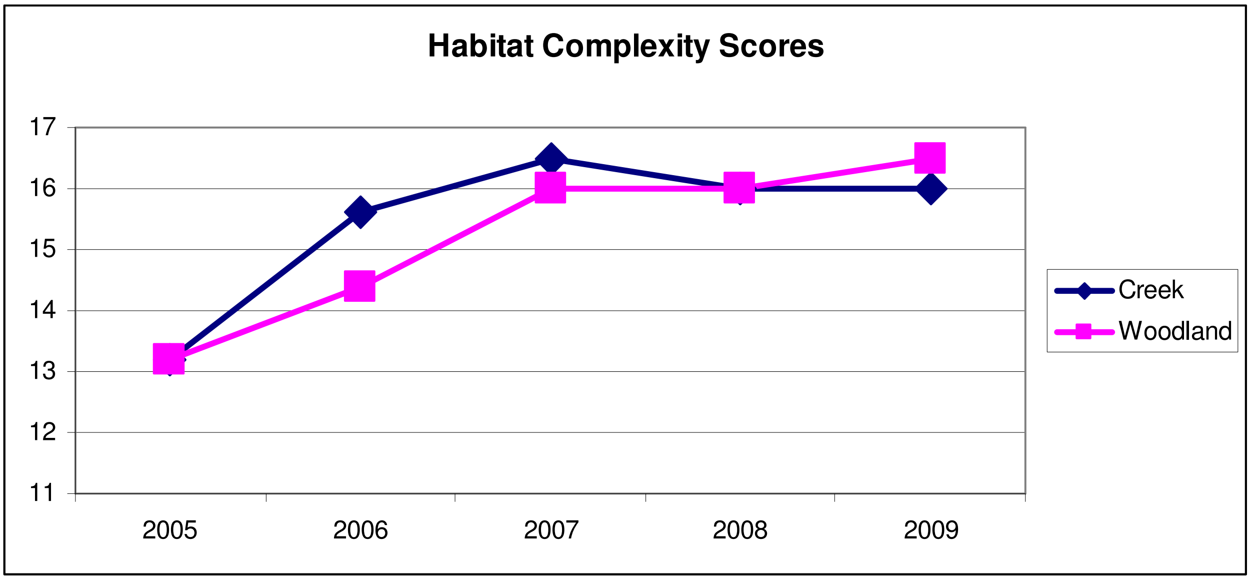
Figure 6.1.6d: Evenness Scores between 2005 and 2009



Measurements of habitat characteristics have been derived from trap site descriptions and have been used to provide an index of habitat complexity that can be helpful in determining changes over time of the habitats surveyed in the SMP Area. All the scores are relatively high, with the 2007 scores being the highest. Over the years, the scores have gradually risen, in both the woodland and creekline habitats. This indicates that the habitat values have improved in the past three years. High Habitat Complexity Scores indicate better habitat for small ground mammals and woodland birds. Changes in the Habitat Complexity Scores are shown in the Figure below.

The main benefit from these approaches is the production of a single number that represents habitat values. By tracking such numbers over time some insight into changes in habitat values may be possible.

Figure 6.1.6e: Habitat Complexity Scores for Creekline and Woodland Habitats between 2005 and 2009



The report concludes by confirming that it will be possible to better track further changes to the terrestrial vertebrate fauna within the LW29-31 SMP Application Area as data continues to accumulate from the on-going surveys. At present however, there appears to be no evidence of any significant effects from subsidence upon the fauna diversity in the LW29-31 SMP Application Area at Baal Bone Colliery.

6.1.7 Flora

Gingra Ecological Surveys submitted their Spring 2009 during November 2009; the results of which were reported in Status Report No. 6. The Summer 2010 report has not yet been received by Baal Bone; therefore results from this report will be discussed in Status Report No. 8.

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 continues to be used to calibrate a mine water make model. Using flow meter data and the estimated goaf storage capacities determined so far, it has been calculated that the average level of groundwater seepage into the mine is in the order of 3.9 ML/day.

Ian Forster from Aurecon is currently finalising a post-closure mine water make model for inclusion in Baal Bone's Detailed Mine Closure Plan. As part of this process the above data will be reviewed and updated where required. Outcomes of this process in relation to LW29-31 underground mine water make at Baal Bone will be discussed in a future Status Report.

6.1.9 Ground Water

Ian Forster from Aurecon monitors data loggers in the six piezometers on a regular basis to gather baseline data regarding groundwater level fluctuations in the vicinity of the Coxs River

Swamp. Baseline data obtained prior to commencement of mining confirms a strong correlation between groundwater levels and prevailing climatic conditions; most particularly the relationship to rainfall.

The rainfall in Lithgow for December was about average at 81mm, while January was below average with a total of 76mm (January average is 94mm). With these conditions, the groundwater levels in all piezometers did not rise at all, and most fell slightly.

However, rain in early February is reflected by the rise in water levels, most notably in BBP1 which has been the subject of previous discussion. The response in all other piezos appears normal in every way, as would be expected from the prevailing climatic conditions.

During February, the two piezometers on either side of the swamp (BBP3 and BBP4) recovered to pre-drought levels. There was also a significant flow of groundwater from the swamp at the crossing just downstream of the monitored area, which confirms that hydrogeological conditions in the swamp remain normal and unaffected by mining.

Data downloaded for March confirmed that all bores were still showing a rising or stabilising trend; most notable of which was the rapid rise and subsequent stable levels recorded in BBP1 and to a lesser extent in BBP2. See **Figures 2 & 3.**

6.2 Subsidence Development (Summary of Survey Results)

During the reporting period, the H-H, I-I and J-J lines around northern and southern pinch points were established and a pre-mining survey completed; as were the scattered arrays at both northern and southern pinch points. Refer **Figures 1C & 1D**.

There was no post-mining surveys conducted during the reporting period. Results of post-mining (LW29) surveys of all subsidence lines and scattered arrays will be included in the next Status Report.

7 ADEQUACY, QUALITY AND EFFECTIVENESS

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

8 PROPOSED ADDITIONAL / OUTSTANDING MANAGEMENT ACTIONS

As discussed above in Section 6.1 additional management actions and response procedures have been implemented in accordance with the Public Safety Management Plan. While ongoing monitoring and review of the groundwater situation is continuing, there is no proposal at this stage to implement any additional management actions.

9 CONCLUSIONS

During the reporting period the faceline of LW29 has retreated 432m, from chainage 438 to chainage 6m. As of 7 April 2010, the faceline of LW29 has retreated a total of 1456m.

Routine scientific and survey monitoring of impacts on rock features, escarpments, and surface and groundwater regimes continued, as did seasonal monitoring of flora and fauna.

Anomalous groundwater behaviour in several monitoring bores as reported previously appears to have stabilised and is showing signs of normalising. All other monitoring results are within expected / predicted parameters. Routine and scheduled seasonal monitoring will continue.

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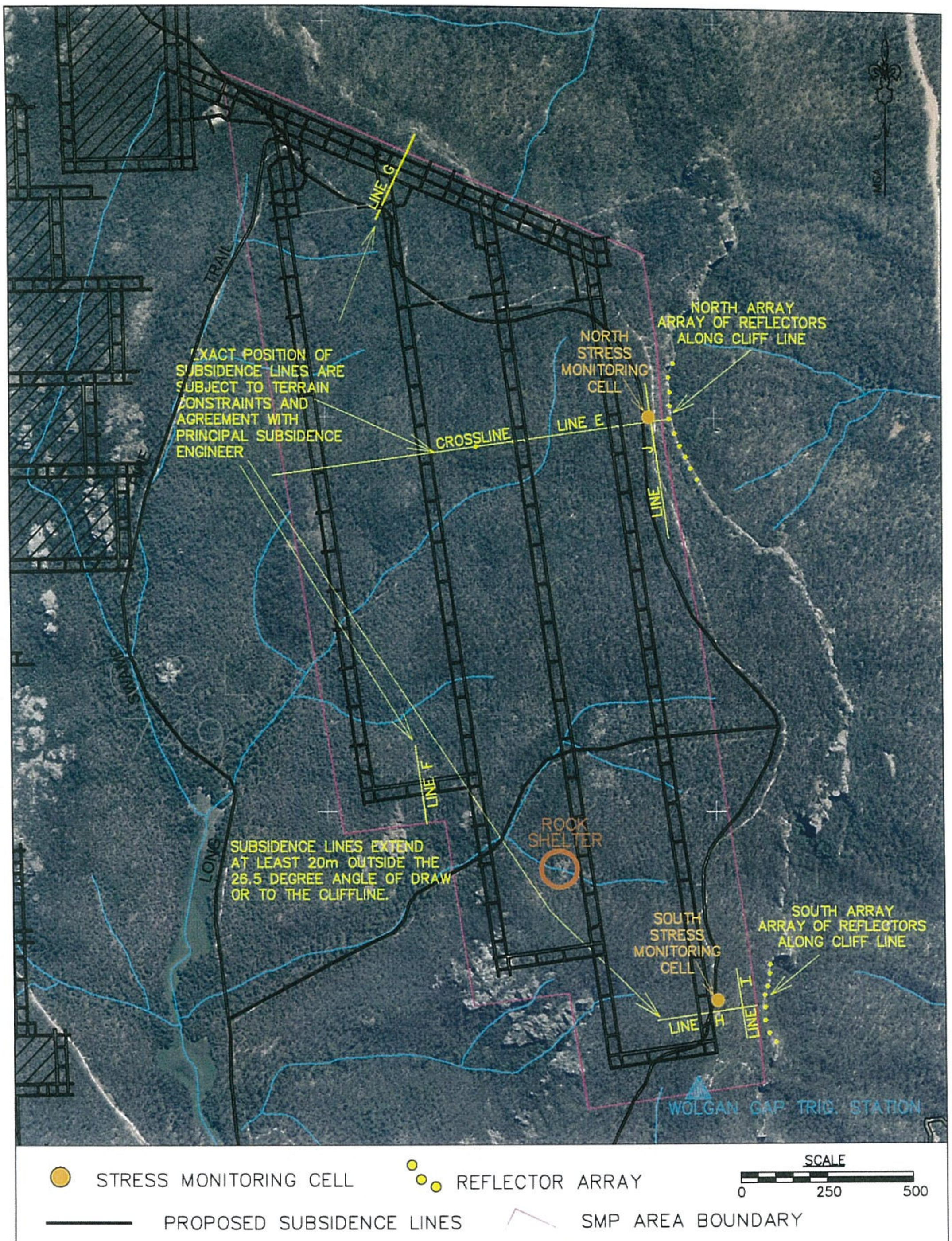
FIGURE 1: Proposed Subsidence Survey and Data Monitoring Locations (Source: *Baal Bone Colliery LW29-31 SMP Subsidence Monitoring Program*)



DRAWN JWS	BAAL BONE COLLIERY		OAKBRIDGE PTY LIMITED
DATE 30/4/2009	TITLE FIGURE 1: PROPOSED SUBSIDENCE SURVEY AND DATA MONITORING LOCATIONS		
CHECKED			
APPROVED			
SCALE N.T.S. A4	COMPUTER PATH G:\techserv\Technical Services\Survey\Survey Plans \Subsidence\LW29-31	DRAWING No. Bbm_LW2931 Subsidence Monitoring.dwg	

FIGURE 1C: Survey Monitoring of North Pinch Point Area

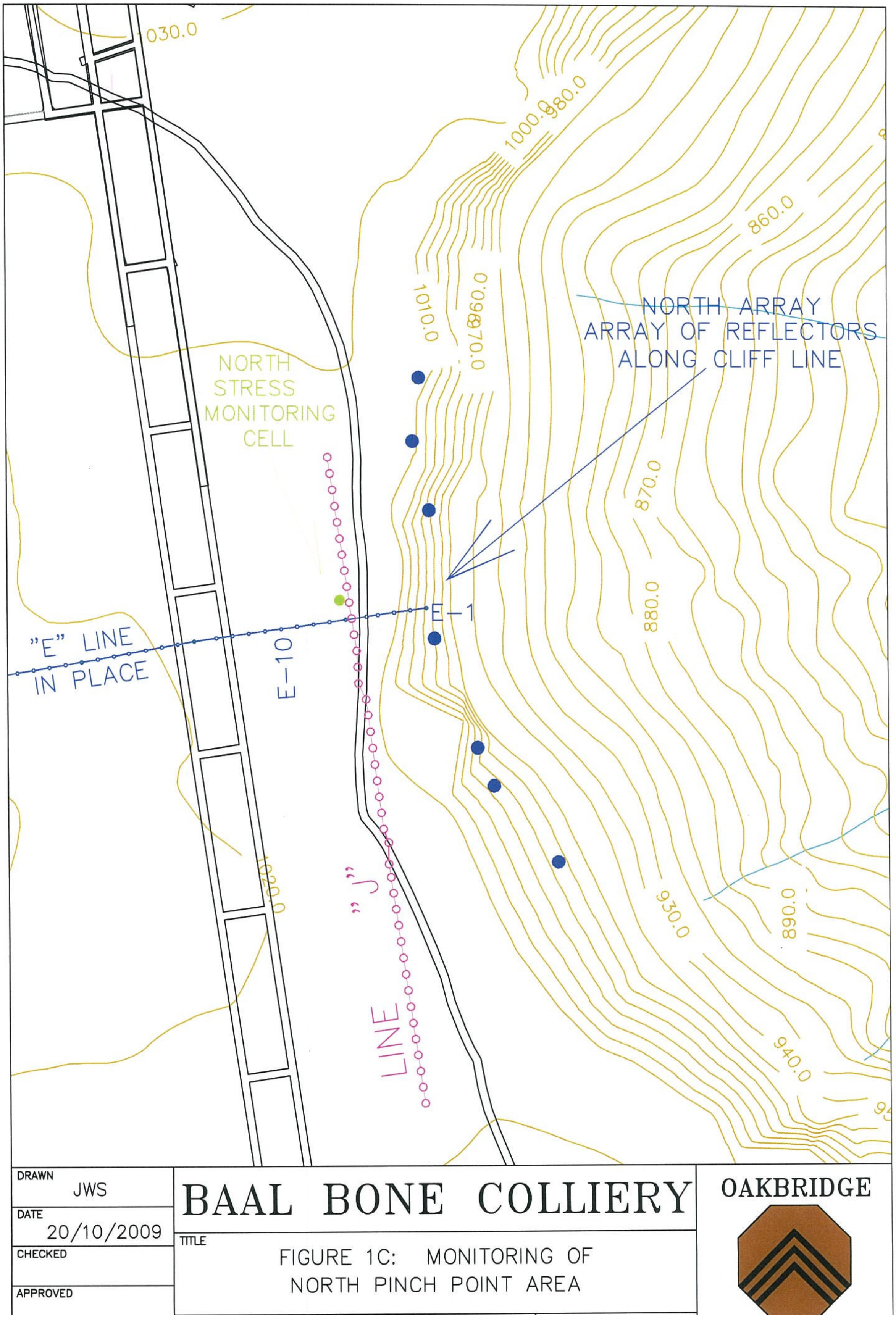


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FIGURE 1D: Survey Monitoring of South Pinch Point Area

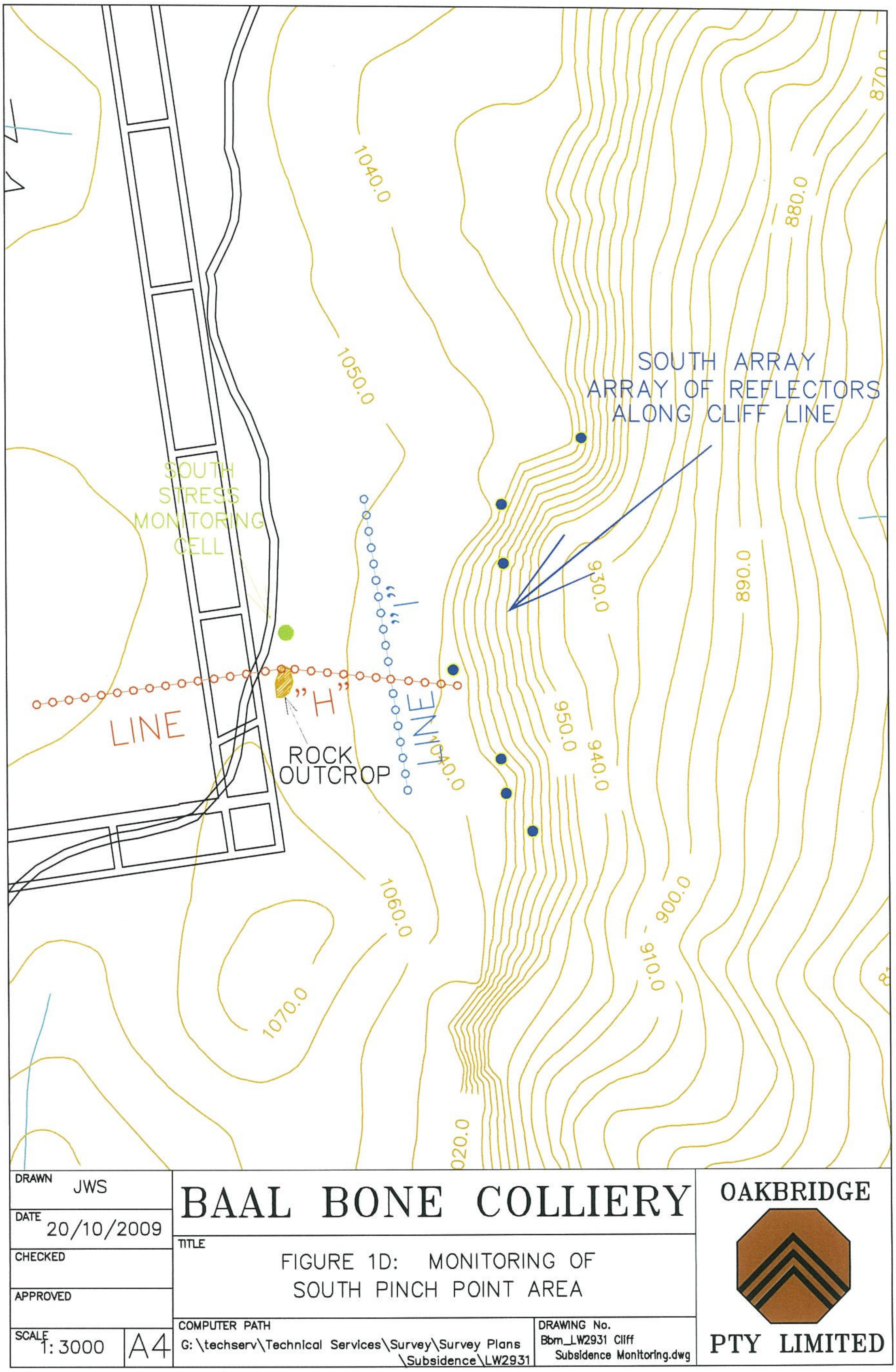

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FIGURE 2

LW29-31 Piezometer Groundwater Levels - 2009

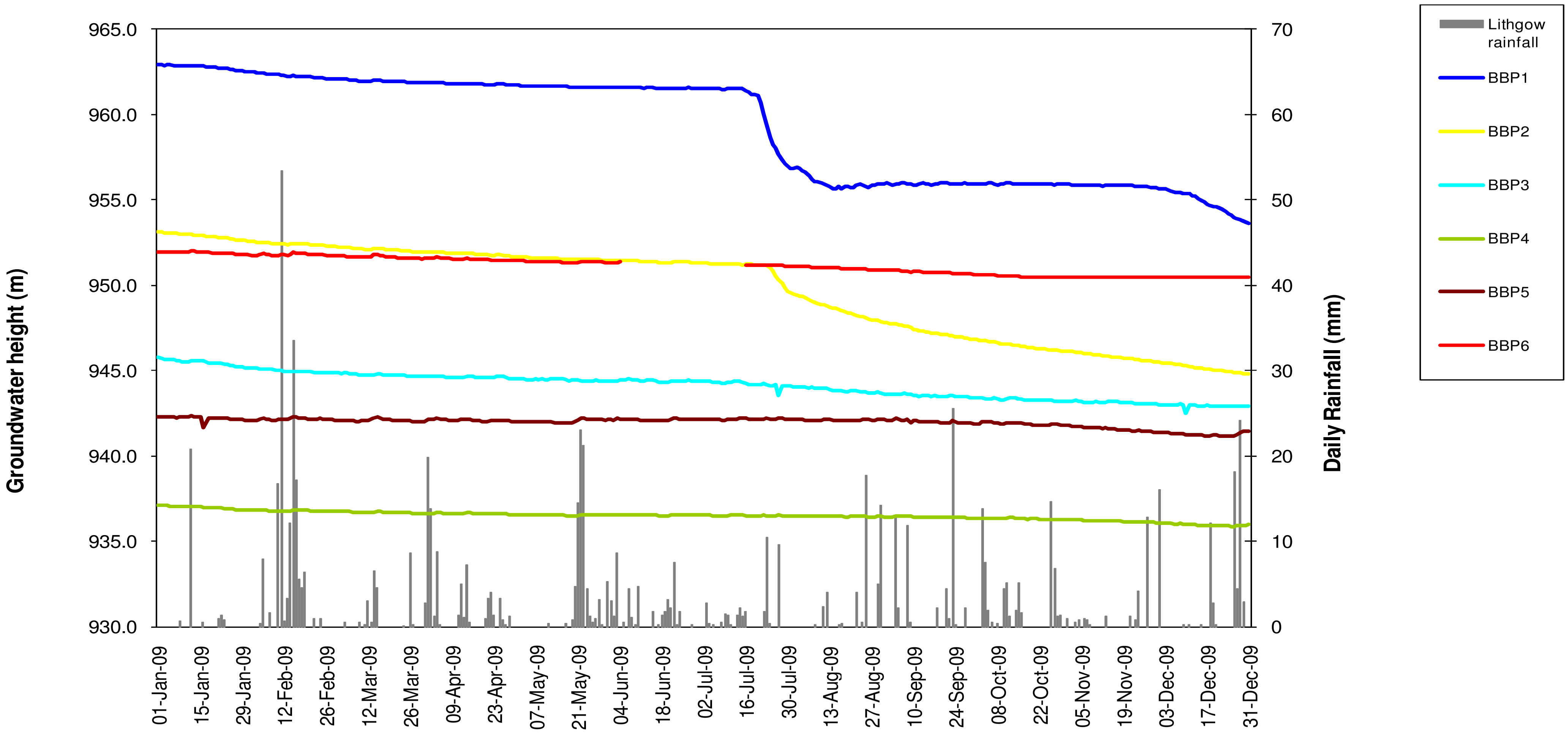

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FIGURE 3

LW29-31 Piezometer Groundwater Levels - 2010