LW101

END OF PANEL REPORT

NARRARBRI MINE

Comments	Author	Authorised By	Date
LW101 End of Panel Report	S Farrar	O Salisbury	December 2013

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1. INTRODUCTION

Narrabri Mine received Subsidence Management Plan (SMP) approval (10/9000) for Longwall Panels (LW) 101 to 105 in April 2012. The SMP was developed as part of the Extraction Plan for Longwall Panels 101 to 105 at the Narrabri Mine. The Extraction Plan, approved on 27 March 2012, is required by the Department of Planning and Infrastructure's (DP&I) consent (08_0144). This end of panel report has been prepared to satisfy the SMP approval, specifically Condition 18, for the 1st Longwall Panel completed at the Narrabri Mine, known as LW101. The specific requirements of Condition 18 are outlined in Table 1.

Table 1: SMP 10/9000 Approval Conditions

SMP Approval Condition	Section Addressed
18. Within 4 months of the completion of each longwall panel, an end of panel report must be submitted to the Director General. The end of panel report must:	This entire document
(a) include a summary of the subsidence and environmental monitoring results for the applicable longwall panel;	Section 3
(b) include an analysis of these monitoring results against the relevant: • impact assessment criteria; • monitoring results from previous panels; and • predictions in the SMP and EA;	Section 4
(c) identify any trends in the monitoring results over the life of the activity; and	Section 5
(d) describe what actions were taken to ensure adequate management of any potential subsidence impacts due to longwall mining.	Section 4

2. BACKGROUND

The first Longwall Panel (LW101) at Narrabri Mine was mined over a period of 12 months, from first coal to completion of the panel. After commissioning the new Longwall unit commercial production commenced in October 2012. Table 2 provides a summary of the LW101 parameters.

Table 2: Longwall 101 Mining Parameters

LW101	Parameters
Target Seam	Hoskissons Seam
Seam Thickness	4.6m to 8.4m
Length	1,786m
Face Width	295.6m
Void	306.4m
Extraction Height	4.2m
Chain Pillar Width	30m
Cover Range	160m to 180m
Commenced	6 June 2012 (Commercial production commenced in October 2012)
Completed	3 June 2013
Coal Extracted	3.1 million tonnes

During the extraction of LW101 Narrabri Mine applied to modify the Subsidence Monitoring Programme, part of the Extraction Plan, to remove a subsidence monitoring line that traversed a dam wall. The dam has been backfilled and therefore the subsidence monitoring line is no longer required. The modification was approved by DP&I on 21 August 2013 and DRE on 2 August 2013.

2.1 Impacts

The surface area affected by the extraction of LW101 comprises mine owned private land holdings used primarily for livestock grazing and cropping. The surface topography is flat to slightly undulating with slopes of 2˚ – 5˚ and topographic relief ranging from 273m AHD to 285m AHD. One ephemeral creek, one public road (known as Greylands Road) and one 11kV electricity transmission line are directly impacted by the extraction of LW101. The mine site infrastructure, Kamilaroi Highway and Northern Branch Railway Line are >1.9km to the east of LW101 and are considered to be outside the limits of far-field displacement and strain as outlined in the Extraction Plan.

The Extraction Plan predicted low impacts to the surface features as a result of mining LW101. Water ponding was predicted to occur above LW101 in and surrounding the ephemeral creek. This did occur during the extraction of LW101, refer to Section 4.2.1 for more details. Large trees along Greylands Road and along the ephemeral creek were impacted by subsidence which was not predicted to occur, refer to Section 4.2.1 for more details. The Annual Environmental Management Report (AEMR) for the period April 2012 to March 2013, submitted to DRE and DP&I on 4 July 2013, also includes information on subsidence and associated impacts.

3. SUBSIDENCE MONITORING RESULTS

Narrabri Mine has established a subsidence monitoring programme, required as part of the Extraction Plan for Longwall Panels LW101 to LW105, to quantify subsidence parameters and to identify subsidence related impacts to environmental and built features. Subsidence monitoring results are reported to the Principal Subsidence Engineer at the Division of Resources and Energy (DRE). The subsidence monitoring programme consists of the following elements and is presented as Attachment 1:

- A transvers subsidence line across longwall panels LW101 to LW105;
- A full-length longitudinal line over LW101 and LW102 with reduced monitoring extending over the starting and finishing point of each remaining longwall block (LW103 – LW105);
- A survey line along the riparian management zone of Pine Creek and Pine Creek Tributary No.1;
- Four additional survey cross lines perpendicular to Pine Creek Tributary No 1 to establish lateral movement impacts; and
- Survey markers on the 11kV power poles for monitoring of tilt and strain to poles over LW101 and LW102.

Aerial Laser Scanning (ALS) surveys have been conducted at Narrabri Mine as they are considered to provide a more thorough understanding of subsidence development and the intention is to phase out the longitudinal monitoring to be replaced with ALS surveys should it prove to be an adequate monitoring technique. To date, Narrabri Mine has completed three surveys: November 2008 (baseline), 31 December 2012 and 25 July 2013. The July 2013 image is included as Figure 1 below.

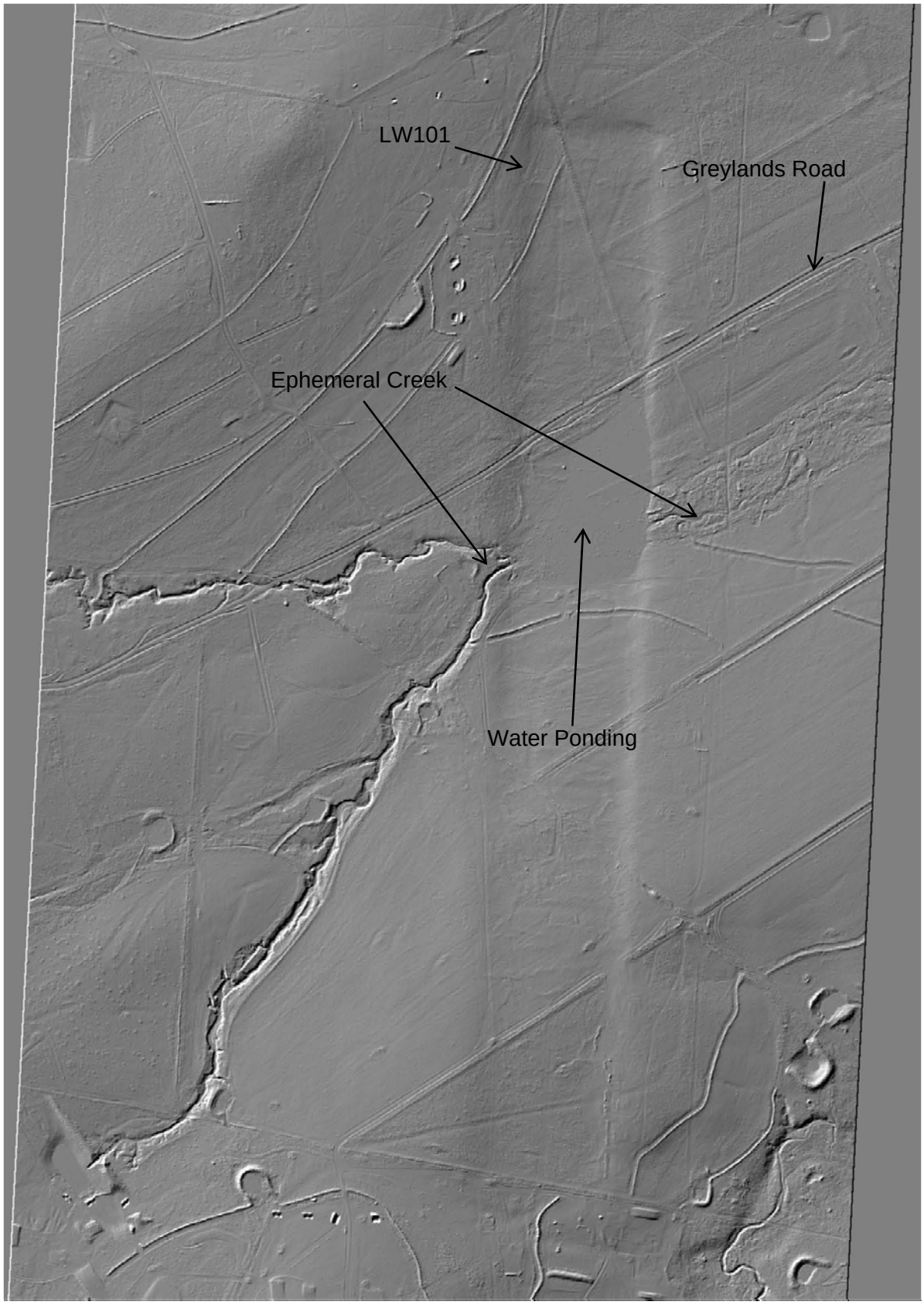


Figure 1: ALS Survey Image of LW101, 25 July 2013

Table 3 outlines all of the longitudinal surveys undertaken up to 31 October 2013 at the Narrabri Mine.

Table 3: Subsidence Monitoring Lines

Monitoring Line	Panel	Installation Date	Survey Date(s)	Survey(s) Completed	Comments
101 –Centreline	101	April & May 2012	9/08/2012, 17/08/2012, 27/08/2012, 6/09/2012, 2/10/2012, 9/10/2012, 6/11/2012, 10/12/2012, 15/01/2013, 18/02/2013, 22/03/2013, 11/04/2013, 6/05/2013, 26/09/2013	14	All points surveyed
102 – Centreline	102	April & May 2012	31/07/2013, 6/08/2013, 9/08/2013, 19/08/2013, 22/08/2013, 26/08/2013, 25/09/2013, 24/10/2013	8	Surveyed to point 161 of 217
103 – Centreline	103	April & May 2012	-	-	-
104 – Centreline	104	-	-	-	-
105 – Centreline	105	-	-	-	-
A - Crossline	101 – 106	April & May 2012	13/11/2012, 3/12/2012, 14/12/2012, 7/02/2013, 21/2/2013, 13/08/2013, 17/09/2013, 1/10/2013, 23/10/2013, 31/10/2013	10	Surveyed to point 157 of 211
B – Pine Creek Tributary 1 (PC1)	101 – 103	April & May 2012	21/11/2012, 3/12/2012, 4/01/2013, 18/06/2013, 21/10/2013	5	All points surveyed
C – Dam Wall	103	*Subsidence line has been removed as dam is to be backfilled.*			
D – Pine Creek (PC)	104 & 105	-	-	-	-
E – PC1 Crossline 1	101 & 102	April & May 2012	4/01/2013, 7/01/2013, 16/01/2013, 18/06/2013, 17/10/2013, 21/10/2013, 23/10/2013	7	All points surveyed
F – PC1 Crossline 2	102	April & May 2012	11/02/2013, 21/02/2013, 25/02/2013, 18/06/2013, 31/10/2013	5	All points surveyed
G – PC1 Crossline 3	102 & 103	April & May 2012	18/06/2013	1	All points surveyed
Power Poles	101 – 105	19 & 21 March 2013	29/04/2013, 1/05/2013, 6/05/2013, 13/05/2013, 17/05/2013, 26/08/2013, 19/09/2013, 29/10/2013	8	Pole 2 to Pole 6

Table 4 compares the predicted subsidence parameters to all of the measured subsidence parameters for data available to 31 October 2013.

Table 4: Subsidence Parameters – Predicted and Observed

LW101 and LW102		
	Maximum Predicted Extraction Plan	Maximum Measured
Line A – Cross Panel Survey Line		
Subsidence (m)	2.44	2.535*
Tilt (mm/m)	47	55.9*
Tensile Strain (mm/m)	11 – 22^	17.1*
Compressive Strain (mm/m)	14 – 28^	23.3*
Angle of Draw (°, Degrees)	22.5 – 26.5	22.8 – 25.7*
Line B – Pine Creek Tributary 1		
Subsidence (m)	2.44	2.435*
Tilt (mm/m)	47	54.8*
Tensile Strain (mm/m)	11 – 22^	12.6*
Compressive Strain (mm/m)	14 – 28^	10.4*
Gradient Change (%)	Up to 6	5.47*
Line E – Pine Creek Tributary 1 Crossline 1		
Subsidence (m)	2.44	0.952*
Tilt (mm/m)	47	26.9*
Tensile Strain (mm/m)	11 – 22^	9.2*
Compressive Strain (mm/m)	14 – 28^	2.9*
Line F – Pine Creek Tributary 1 Crossline 2		
Subsidence (m)	2.44	0.144*
Tilt (mm/m)	41	8.4*
Tensile Strain (mm/m)	10 – 20^	1.6*
Compressive Strain (mm/m)	12 – 24^	1.4*
Line G – Pine Creek Tributary 1 Crossline 3		
Subsidence (m)	2.44	0.022*
Tilt (mm/m)	41	0.3*
Tensile Strain (mm/m)	10 – 20^	0.7*
Compressive Strain (mm/m)	12 – 24^	0.6*
Line 101 – Centre of LW101		
Subsidence (m)	2.44	2.606
Tilt (mm/m)	47	46.2
Tensile Strain (mm/m)	11 – 22^	20.7
Compressive Strain (mm/m)	14 – 28^	26.6
Angle of Draw (°, Degrees)	22.5 – 26.5	23.2
Line 102 – Centre of LW102		
Subsidence (m)	2.44	2.609*
Tilt (mm/m)	41	43.7*
Tensile Strain (mm/m)	10 – 20^	20.5*

LW101 and LW102		
	Maximum Predicted Extraction Plan	Maximum Measured
Compressive Strain (mm/m)	12 – 24^	46.7*
Angle of Draw (°, Degrees)	22.5 – 26.5	20.8*
Electricity Transmission Lines – 11kV Power Poles		
Pole 2		
Subsidence (m)	0	0.005
Dynamic Tilt (mm/m)	0	1.9
Final Tilt (mm/m)	0	0.6
Conductor length change between poles 2-3 (m)	0.13	0.4
Conductor Clearance Loss (m)	0.77	0.534
Pole 3		
Subsidence (m)	2.18	1.919
Dynamic Tilt (mm/m)	30	66.3
Final Tilt (mm/m)	12	42.7
Conductor length change between poles 3 - 4 (m)	0.28	-0.34
Conductor Clearance Loss (m)	1.10	-0.647
Pole 4		
Subsidence (m)	2.11	0.011
Dynamic Tilt (mm/m)	25	5.5
Final Tilt (mm/m)	15	4.7
Conductor length change between poles 4 - 5 (m)	0.13	-0.02
Conductor Clearance Loss (m)	0.07	0.210
Pole 5		
Subsidence (m)	0.31	0.015
Dynamic Tilt (mm/m)	2	4.1
Final Tilt (mm/m)	2	2.6
Conductor length change between poles 5 - 6 (m)	0.024	-0.01
Conductor Clearance Loss (m)	0.30	0.242
Pole 6		
Subsidence (m)	0.01	0.008
Dynamic Tilt (mm/m)	1	3.5
Final Tilt (mm/m)	1	3.5

* - subsidence development incomplete.

^ - values for ‘smooth’ and ‘discontinuous’ (i.e. crack affected) subsidence profiles.

Based on Table 4, several subsidence prediction exceedances have occurred above LW101 during the reporting period:

- The maximum subsidence measurements were within +/- 10% of the predicted value of 2.44 m with an average measured value of 2.399 m, refer to Figure 2.
- The maximum tilt measurements recorded for Line B were within 15% of the predicted value of 47 mm/m, refer to Figure 3.
- The maximum tensile strain measurements for LW101 were within the predicted range of the values of 11 mm/m (smooth profile) and 22 mm/m (discontinuous or crack affected profiles), refer to Figure 4.
- The maximum compressive strain measurements for LW101 were within the range of the predicted values of 14 mm/m (smooth profile) and 28 mm/m (discontinuous or crack affected profiles), refer to Figure 4.

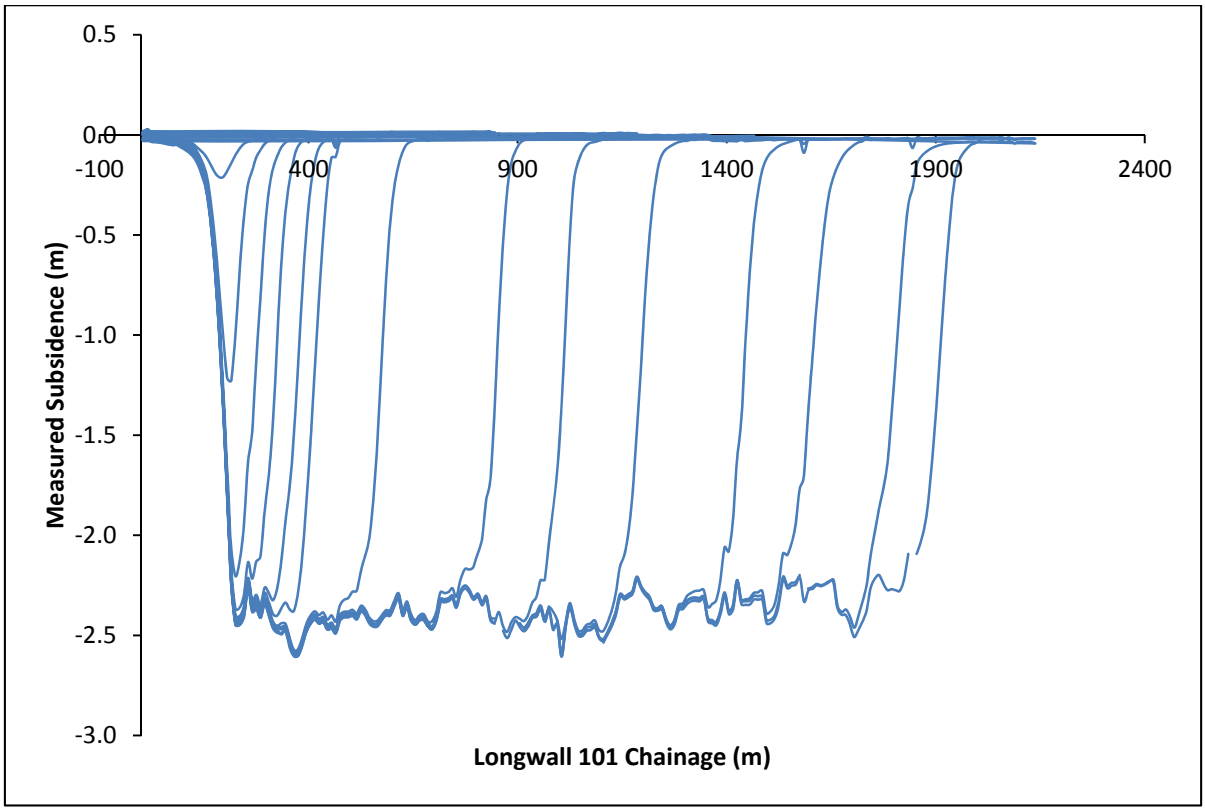


Figure 2: LW101 Subsidence

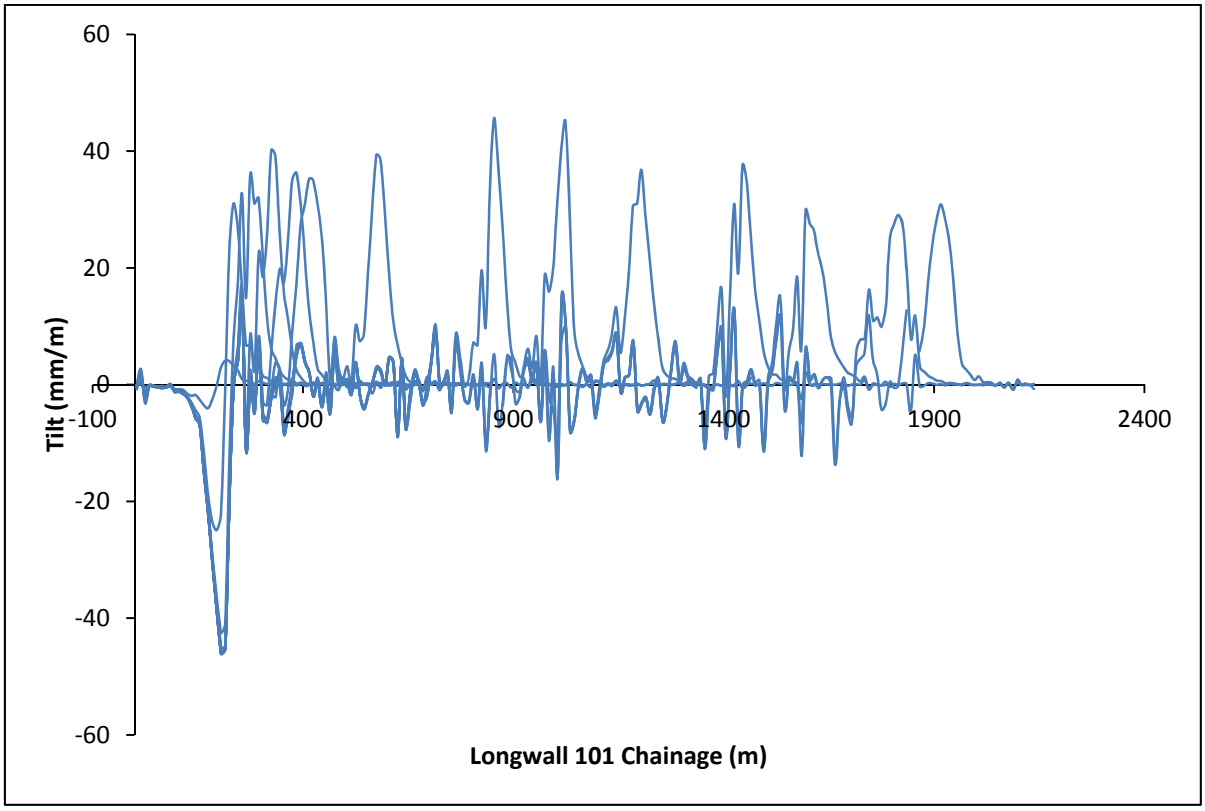


Figure 3: LW101 Tilt

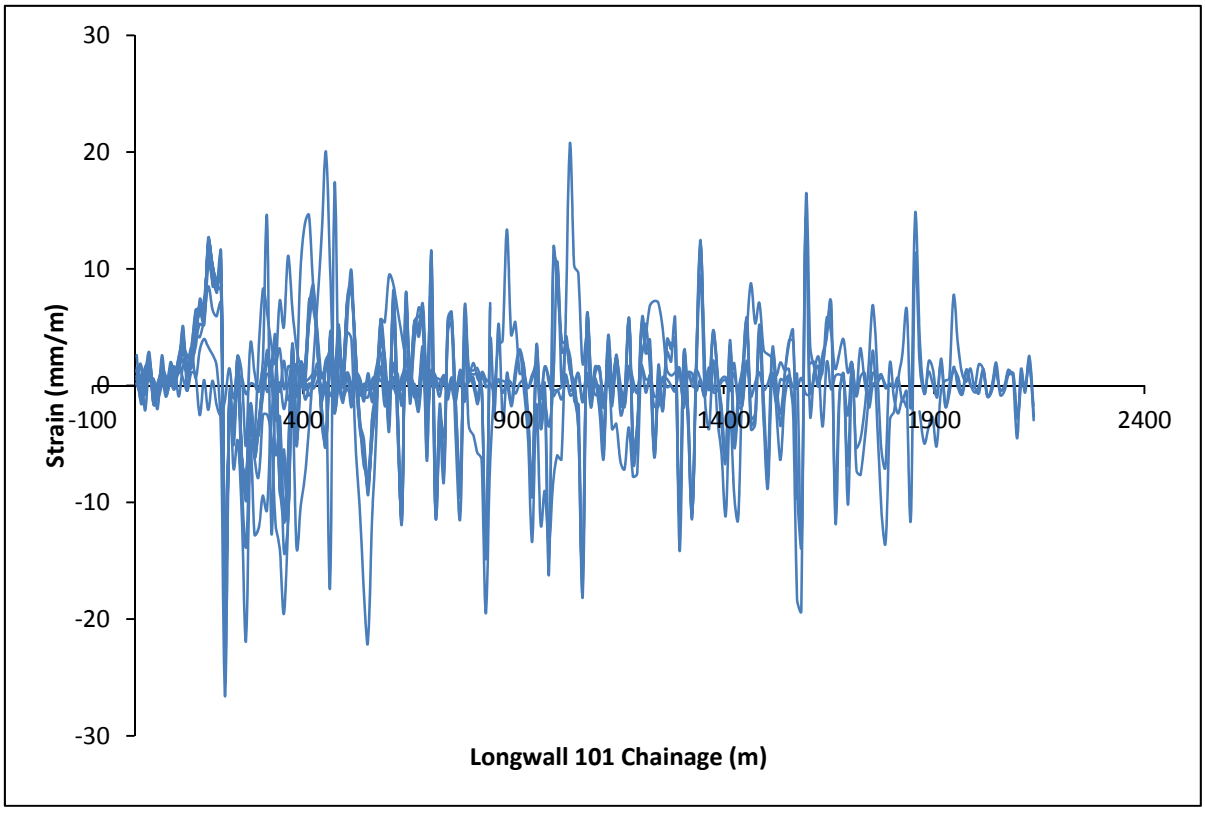


Figure 4: LW101 Strain

The centreline subsidence results for LW101 indicate that the Garrawilla Volcanics and Basalt Sill have not reduced subsidence through spanning behaviour. The maximum subsidence is also considered to be closer to 62% of the maximum mining height of 4.2m, with 25% of the measured values exceeding the prediction based on 58%.

4. SUBSIDENCE IMPACTS

4.1 Monitoring Results from Previous Panels

This report has been prepared for the first panel at the Narrabri Mine with no previous Longwall mining and therefore no results are available.

4.2 Predictions in the SMP and EA

4.2.1 Natural Features

Pine Creek and Tributaries

Water ponding has been observed in LW101 where it intersects an ephemeral creek, a tributary of Pine Creek (refer to Photo 1). The ponding was predicted to occur at this location and it was also predicted that this area would be subject to the worst of the ponding as a result of Longwall mining. This is due to the flat nature of the creek in this area. Advice was received from ecological and stream specialists during the reporting period and it is summarised below.

Photo 1: Ponding at LW101 and Pine Creek Tributary 1

Pine Creek and its tributaries are part of an actively eroding ephemeral creek system. This erosion is, in part, due to natural creek processes (erosion and deposition) but is also exacerbated by historical land clearing and grazing practices. Vertical banks are common and indicate the dispersive nature of soils along the drainage line. The catchment of Pine Creek Tributary 1 consists primarily of cleared agricultural lands with existing areas of significant erosion occurring along the creek. The reach of Pine Creek Tributary 1 that crosses LW101 is a third order stream that drains to the east and is fed by a number of small first order streams from the west. It is a small incised channel approximately 5-6 m wide and up to 0.8 m depth. A sand slug was observed in the reach during the last two years of monitoring. Significant channel erosion was also observed downstream and outside the mine impact area, north of Greylands Road.

As predicted in the subsidence assessment, small reaches of the creek have increased or decreased in gradient at the upstream and downstream extent of ponding. The downstream extent of the ponded area (i.e. towards the eastern extent of LW101) appears stable, as did the reach of creek immediately downstream of LW101. Ponding within LW101 potentially provides a temporary wetland with ecological benefits including habitat refuge for fauna.

Some channel erosion has occurred in the upstream extent of the creek within LW101 in a small reach where channel bed slope has increased (i.e. from the chain pillar on the western edge of LW101 towards the area of maximum subsidence in the centre of the panel). Subsidence monitoring data shows a maximum increase in bed gradient in this reach of 5.35% (refer to Photo 2).

Changes to bed slope and ongoing channel degradation/aggradation are natural creek processes for a system such as Pine Creek Tributary 1. These erosion processes are driven by stream power, velocity and shear stress. It is expected that the system will naturally re-adjust to changes as a result of subsidence to reach a dynamic equilibrium. The ponding of surface water that has occurred within LW101 is not expected to cause an increase in downstream erosion.

Narrabri Mine currently manages the ponded water by pumping the water downstream of the ponding area back to the creek. Water quality analysis is also undertaken on a monthly basis. The results indicate water quality parameters, including pH, EC, TSS, Oil & Grease, and turbidity, are within the range of background levels for the mining area.

Photo 2: Change in Channel Grade Upstream of Ponding in LW101

Groundwater Resources

Narrabri Mine has an extensive groundwater monitoring program consisting of 43 monitoring wells. The monitoring can be summarised as follows:

- Nine licenced production wells that Narrabri Mine monitor for water levels and/or water quality in the Namoi River alluvium (WB2-WB7);
- Twenty three standpipe piezometers that Narrabri Mine monitoring for water levels and quality within and surrounding the mining lease (P1-P5, P7-P13, P15-P16, P19, P28-P34 & P47); and
- Eleven vibrating wire piezometers (VWP) that Narrabri Mine monitor for water levels within and surrounding the mining lease (P23-P24, P26-P27, P35-P37, P40 & P44-P46).

The eleven VWP's includes four life-of-mine groundwater monitoring wells that have been installed as required by the Water Management Plan for the Longwall Project. P47 is a life-of-mine standpipe piezometer targeting the Garrawilla Volcanics to the north of LW102.

There are two more VWP's and two more standpipe piezometers to be installed as part of the life-of-mine monitoring programme.

The Groundwater Assessment undertaken as part of the Stage 2 Longwall Project EA predicted the following impacts to groundwater resources surrounding the mine site at the end of mining, i.e. Year 29:

- Permian Coal Measures: In the Hoskissons Coal Seam drawdowns of 1m or more are predicted to extend to a maximum of 20km from the mined areas to the southwest and northeast
- Triassic Formations: In the Napperby Formation drawdowns of 1m or more are predicted to extend to a maximum of 10km from the mined area to the southwest and northwest;
- Jurassic Formations: In the Garrawilla Volcanics drawdowns of 1m or more are predicted to extend to between 5 and 8km to the west of the mined areas. The Pilliga Formation is dry within the Longwall project area and therefore no drawdowns are predicted; and
- Quaternary Alluvium/Colluvium/Regolith: In the alluvium/colluvium/regolith drawdowns of 0.5m are predicted to extend up to 3km to the north but drawdown impact is generally limited to the mining lease.

The results of life-of-mine water level monitoring required by the Water Management Plan for the Longwall Operation are provided in Appendix 1. The results indicate that the extraction of the LW101 has not impacted upon water levels surrounding the mine site.

Groundwater inflow monitoring results are described in the Narrabri Mine 2012-2013 Annual Environmental Management Report (AEMR). Groundwater inflows were predicted to vary from 0.22ML/day in the first year to approx. 3.83ML/day in Year 18. For the AEMR reporting period, which includes the majority of extraction time for LW101, the average daily inflow was calculated to be 0.625ML/day, comprising 0.455ML/day of mine dewatering and 0.170ML/day of pre-drainage water. It should also be noted that while 0.455ML/day was pumped from the underground 0.603ML/day was fed underground for operations and a portion of this water would be captured in the mine dewatering volumes.

Threatened or Protected Species

No threatened or protected species were impacted by the extraction of LW101.

Natural Vegetation

Following the extraction of LW101 at the Narrabri Mine, large trees located above the panel underwent substantial stress and many have subsequently died, refer to Photo 3. Tree stress was evident very soon after the panel was extracted, generally within 3 – 6 weeks and prior to any ponding. As this was not predicted to occur in the Extraction Plan and the Narrabri Mine Biodiversity Management Plan, part of the Extraction Plan requires that a site investigation and site specific management plan be developed if there is greater than a 10% change in vegetation floristic composition. Narrabri Mine has investigated the impacts to the trees and the results are summarised below.

Photo 3: Impacted Trees above LW101

A review of the known impacts of Longwall mine subsidence on surface environments and their consequences on tree species have been considered. Given the nature of the impact to the trees above LW101, in which only large trees were subject to decline, and where such decline was relatively rapid, it is likely that root ball disturbance associated with sub-surface soil movement was the cause of tree stress and mortality. It is noted that mechanical disturbance to the physical soil profile is likely to have been considerable as the maximum panel subsidence recorded across LW101 was 2.606m. Other possible causes of tree mortality such as drought, disease, infection and pests were considered. Due to the very close alignment of the impacted trees to the LW101 subsidence footprint, coupled with un-impacted trees occurring immediately adjacent to the subsidence area, these factors were not likely to have caused the impact.

Further investigation of the root ball will be undertaken and reported in the near future. This should provide a more detailed understanding of the likely causes and possible means of mitigation. Narrabri Mine may also consider monitoring the local water table and soil moisture conditions to facilitate understanding of the role of soil shear strength and moisture conditions in future subsidence areas.

Land Surface

Informal visual observations in the subsidence area were undertaken as part of general duties in addition to the formal inspections of Greylands Road, required by the Extraction Plan, undertaken when undermining the road. Surface cracks observed were typically

50mm to 100mm wide with some cracks widths up to 200 mm (refer to Photo 4). The cracks were within the predicted range. The majority of LW101 has been ploughed, refer to Photo 5, to fill in cracks and to maintain soil moisture. A winter seed cropping mix was then spread over the ploughed area as outlined in the Mining Operations Plan (MOP) for the Narrabri Mine.

Photo 4: LW101 Surface Crack

Photo 5: Ploughing Subsidence Area of LW101

4.2.2 Public Utilities

Roads

One public road was undermined during the extraction of LW101, known as Greylands Road. Narrabri Mine developed a management plan, known as the Greylands Road Management Plan (GRMP), for this road in consultation with Narrabri Shire Council (NSC) in accordance with Condition 14 of SMP approval 10/9000. The management approach for Greylands Road was approved by DRE on 19 October 2012 and the GRMP which formalised the management measures to be implemented was signed by both Narrabri Mine and NSC on 6 November 2012.

Daily inspections during active subsidence were undertaken as outlined in the GRMP and the Built Features Management Plan, part of the Extraction Plan. In accordance with the GRMP, Greylands Road was inspected by NSC and closed prior to undermining. Following mining, Narrabri Mine undertook remediation works in the form of stabilising the surface of the road with gravel and adding a culvert and drainage works to ensure the road will not be inundated from ponding water (refer to Photo 3). The road was re-opened in consultation with NSC on 22 March 2013 following an inspection to confirm the necessary remedial activities were undertaken to NSC's satisfaction.

Culverts

No culverts were undermined during the extraction of LW101.

Electricity Transmission Lines

Narrabri Mine developed a management plan, known as the Essential Energy Management Plan (EEMP), to manage subsidence impacts to the 11kV power line that traverses LW101 to LW105. The EEMP was agreed to by Essential Energy on 4 February 2013 and approved by DRE as satisfying the requirements of SMP 10/9000 Condition 14 on 12 March 2013. Narrabri Mine implemented the EEMP on 19 and 21 March 2013 by installing sheaves/rollers on the 11kV power line.

This power line was undermined during May 2013. The lessee of the mine owned "West Haven" property has been provided with an alternative power supply as outlined in the EEMP. Survey monitoring of the power poles and conductor clearances was undertaken as required by the Subsidence Monitoring Program, refer to Table 4.

Telecommunications Lines

No telecommunications infrastructure exists within the Extraction Plan area for LW101 to LW105.

4.2.3 Farm Land and Facilities

Agricultural Utilisation or Agricultural Suitability of Farm Land

The majority of land overlying LW101 has been ploughed and reseeded with a pasture species mix as required by the Landscape Management Plan, part of the Extraction Plan. The only area affected by subsidence where agricultural suitability is impacted is where water ponds at the ephemeral creek. The ponded water is currently pumped downstream when required. The ephemeral nature of the creek system is such that any ponding that does occur will be for relatively short periods only, and on this basis will have negligible effect on agricultural utilisation or agricultural suitability. A long-term management strategy for the water ponding area will be to consider the installation of a permanent drainage channel to allow this water to continue to flow downstream which will limit the area covered by ponding water at this location. Any works of this nature will be subject to appropriate advice from relevant specialists.

Farm Buildings or Sheds

No farm buildings or sheds were undermined during the extraction of LW101.

Fences

Fences and gates were undermined during the extraction of LW101. Narrabri Mine has excluded all stock from the active mining area by erecting a fence outside of the subsidence zone to the east of LW101. Any fences/gates required post-mining will be reinstated.

Farm Dams

No farm dams were undermined during the extraction of LW101.

Soil Conservation Works

Six contour banks, or parts thereof, were undermined during the extraction of LW101. The subsidence impacts to the contour banks did not affect there functionality. However, should remediation works be required, Narrabri Mine will either reinstate the contour banks or remove a section to avoid water ponding.

Wells or Bores

The groundwater data indicates that no private wells were impacted by the extraction of LW101 (refer to Section 4.2.1). One mine installed monitoring bore, P38, was directly impacted by the extraction of LW101.

Access Tracks

Access tracks were impacted by the extraction of LW101 however most were in relation to access for mine infrastructure such as boreholes which are now decommissioned. Access tracks along the perimeter of former farm paddocks will be reinstated once mining is complete.

4.2.4 Industrial, Commercial and Business Establishments

Mine Infrastructure

Pipelines connecting gas drainage wells were undermined during the extraction of LW101 however no impacts were recorded on this infrastructure. All gas drainage infrastructure in the active mining area is inspected and maintained to ensure subsidence does not adversely impact this equipment. Narrabri Mine also decommissions gas drainage infrastructure when it is no longer required. The Personal Emergency Device (PED) cable buried around LW101 to LW105 was not impacted by the extraction of LW101.

4.2.5 Other Significant Features

Areas of Archaeological and/or Heritage Significance

Two previously identified cultural heritage sites are located above LW101. Site 20 is a scarred tree within the creek line in the centre of LW101. The scar is intact although the tree is stressed consistent with the impacts described in Section 4.2.1. Site 21 is an isolated chert flake artefact that is located outside the subsidence area above the gate roads. This site has not been impacted by subsidence.

5. TRENDS IN MONITORING RESULTS

As this is the first Longwall panel extracted at the Narrabri Mine no trends are identifiable to date. Maximum subsidence data indicates that maximum subsidence measured in LW101 is closer to 62% of the cutting height when 58% was predicted in the EA.

6. CONSULTATION

During the extraction of LW101 Narrabri Mine consulted with following organisations:

- Essential Energy in relation to the management of the 11kV power line that traverses LW101 to LW105;
- Narrabri Shire Council (NSC) in relation to the management of the one public road in the extraction area known as Greylands Road;
- the Division of Resources and Energy (DRE) in relation to subsidence results and the variation to the approved Subsidence Monitoring Programme; and
- the Department of Planning and Infrastructure (DP&I) in relation to the variation to the Subsidence Monitoring Programme, part of the Extraction Plan.

Narrabri Mine also contacted lessee's in relation to the subsidence impacts where required. Discussions are ongoing with the resident at the mine owned "West Haven" property which has been provided with an alternative power supply as required by the Essential Energy Management Plan (EEMP).

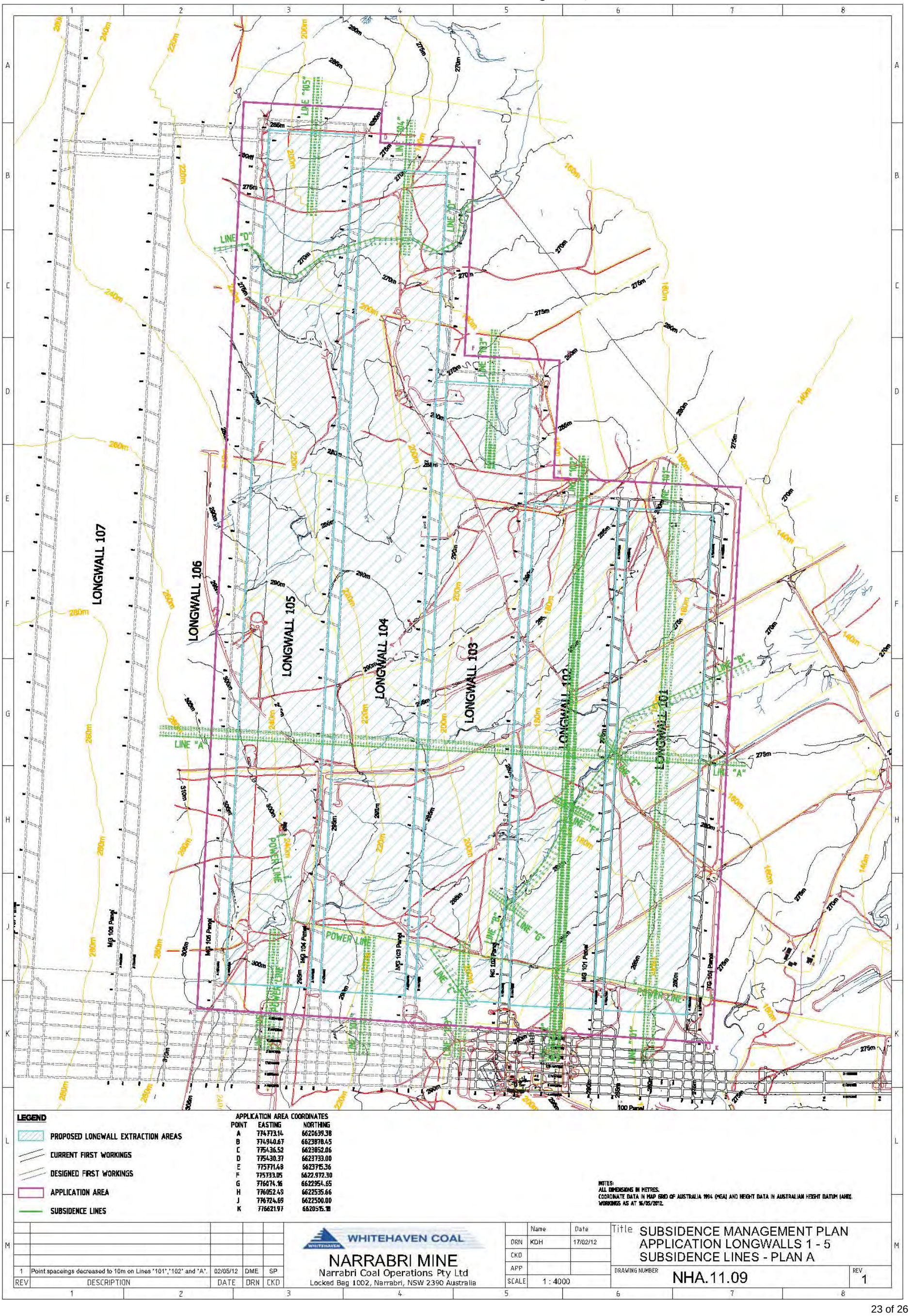
6.1 Community Complaints

No community complaints were received in relation to subsidence and subsidence related impacts during the extraction of LW101.

6.2 Narrabri Mine Community Consultative Committee

Narrabri Mines' Community Consultative Committee (CCC) receives updates on the progress of the mine at the quarterly meetings including subsidence impacts. The CCC also undertook a surface tour above LW101 during April 2013. Concerns were raised by the CCC in relation to the water ponding in LW101. Narrabri Mine commissioned an investigation by ecologists and stream specialists into the water ponding in LW101, which has been provided to the CCC, the results of which are summarised in Section 4.2.1. Copies of the Narrabri Mine CCC meeting minutes are available on the Whitehaven Coal website.

Attachment 1: Narrabri Mine Subsidence Monitoring Lines, LW 101 to 105



Appendix 1: Narrabri Mine Groundwater Monitoring Results

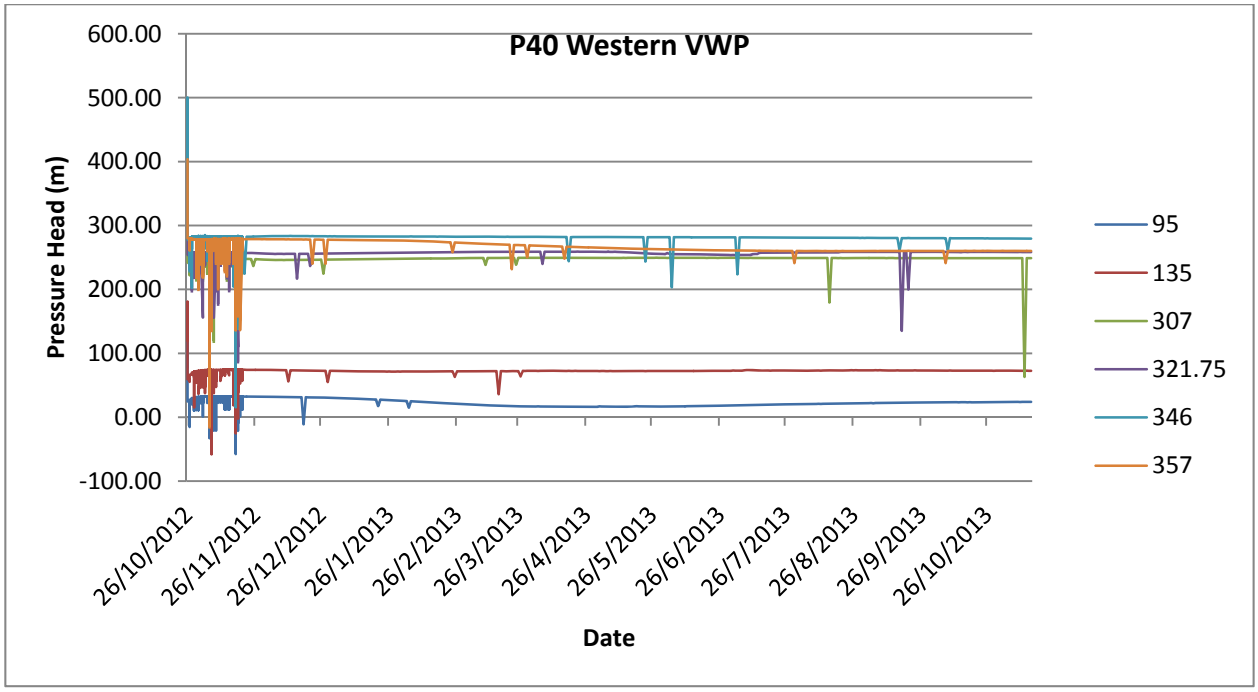


Figure 1: P40 Monitoring Results

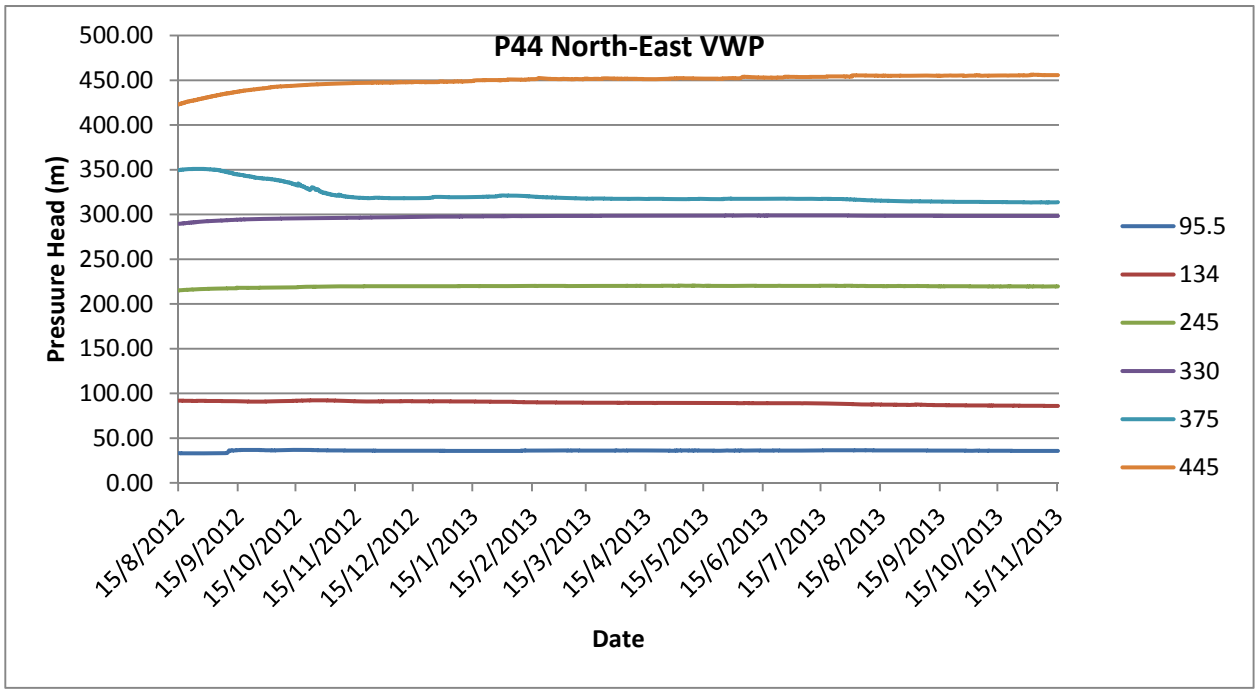


Figure 2: P44 Monitoring Results

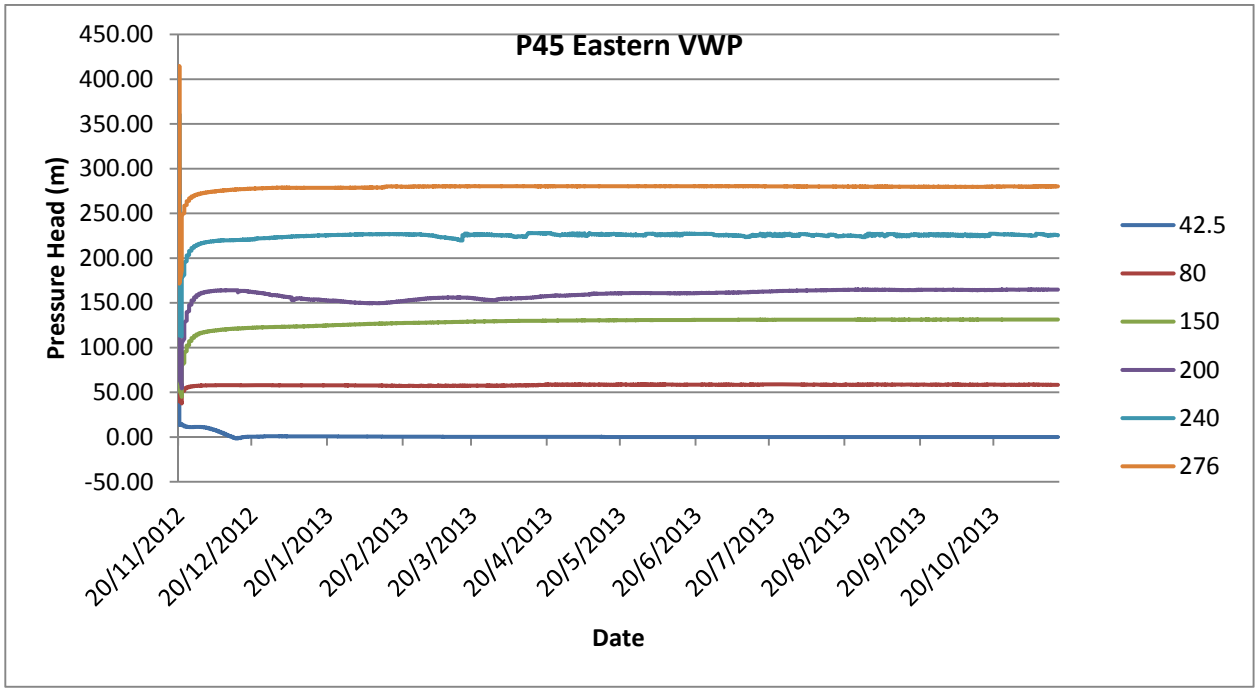


Figure 3: P45 Monitoring Results

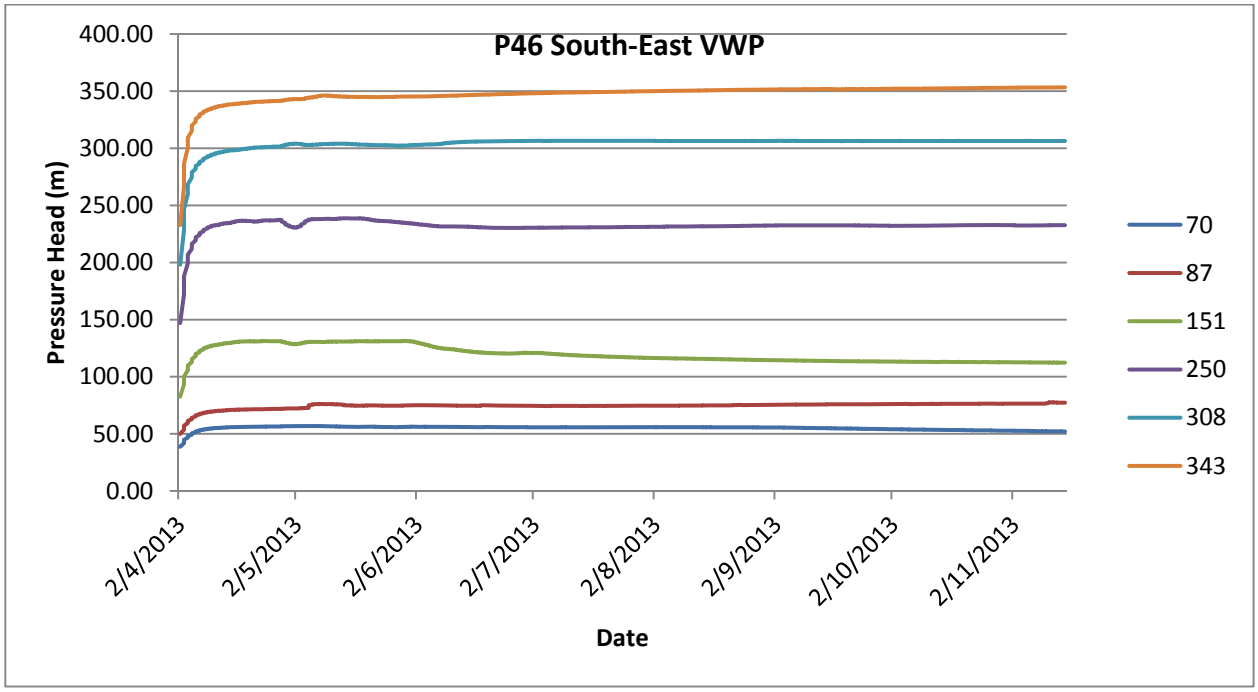


Figure 4: P46 Monitoring Results

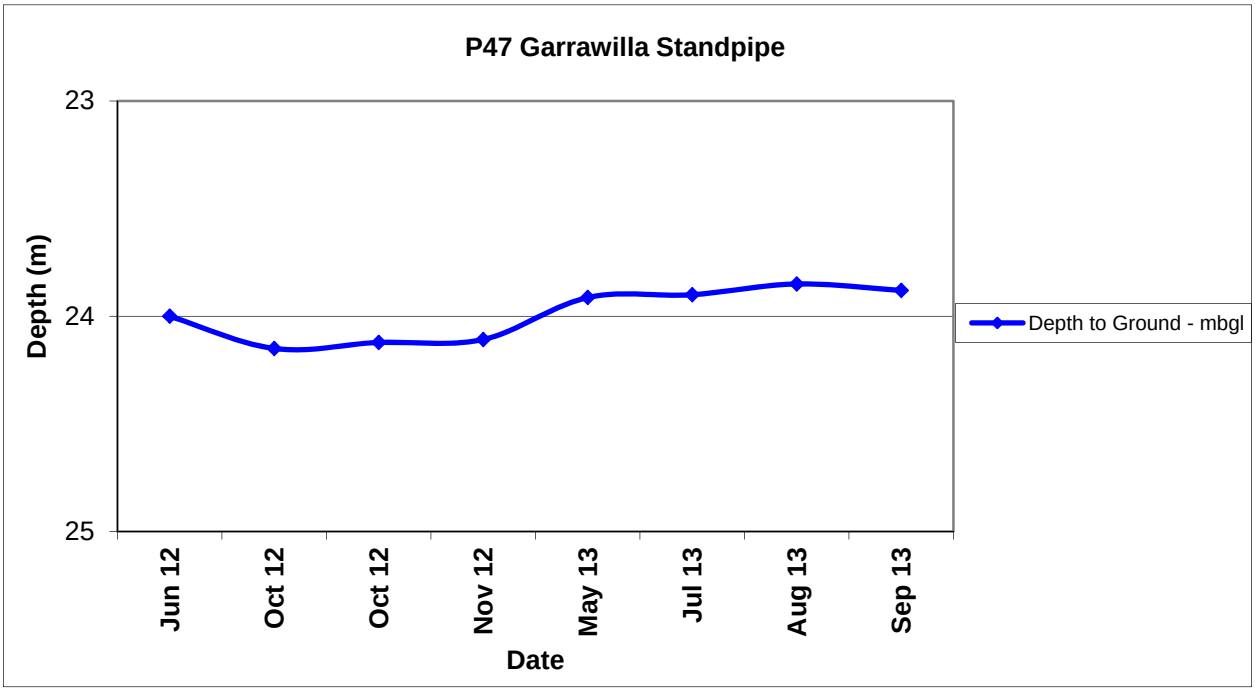


Figure 5: P47 Monitoring Results