WAMBO COAL PTY LIMITED

SOUTH BATES (WHYBROW SEAM) UNDERGROUND MINE

EXTRACTION PLAN LONGWALLS 11 TO 13

REPORT 2

GROUNDWATER ASSESSMENT REVIEW

Peabody ENERGY

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DATE: 2 October 2015

TO: Micheal Alexander
Director Projects and Technical Services
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Peabody Energy Australia
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FROM: Dr Noel Merrick

RE: **South Bates (Whybrow Seam) Underground Mine Extraction Plan – Groundwater Assessment Review**

OUR REF: HC2015/36

This report responds to a request from Wambo Coal Pty Ltd (WCPL) for a groundwater assessment review of the Extraction Plan for Longwalls 11 to 13 of the South Bates Underground Mine (**Figure 1**). WCPL has approval for the extraction of three longwall panels in the Whybrow Seam to the immediate north of the North Wambo Underground Mine (**Figure 2**).

WCPL has prepared an Extraction Plan for Longwalls 11 to 13. This Extraction Plan outlines the proposed management, mitigation, monitoring and reporting of potential subsidence impacts and environmental consequences from the secondary extraction of approved longwalls at the South Bates Underground Mine. Additional information on the Wambo Coal Mine and the South Bates Underground Mine is provided in the main text of the Extraction Plan.

Heritage Computing Pty Ltd (HC), now trading as HydroSimulations (HS), constructed and calibrated a numerical groundwater model that has been applied recently to the South Bates (Wambo Seam) Underground Mine Modification Groundwater Assessment (HydroSimulations, 2015). The Modification consists of an additional three longwalls (14 to 16) in the Wambo Seam underlying the approved mining in the Whybrow Seam. This report includes the predicted groundwater responses for the approved South Bates Underground Mine, the subject of this review.

Scope of Work

In accordance with Condition 22D, Schedule 4 of the Development Consent, this report includes a summary of predicted impacts to groundwater resources from South Bates Underground (Whybrow Seam).

Documentation

The following documents have been relied upon as an aid to this groundwater assessment review:

1. Heritage Computing Pty Ltd (HC), 2012, *North Wambo Underground Mine Modification Groundwater Assessment*. September 2012. Heritage Computing Report HC2012/3.
2. HydroSimulations (HS), 2015, *South Bates (Wambo Seam) Underground Mine Modification – Groundwater Assessment*. Report HC2015/026 for Wambo Coal Pty Ltd. July 2015.
3. Mine Subsidence Engineering Consultants (MSEC), 2015, *South Bates (Whybrow Seam) Subsidence Assessment - Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of the Extraction Plan for Longwalls 11 to 13 in the Whybrow Seam*. Report No. MSEC 692. Report prepared for Wambo Coal Pty Ltd, September 2015.
4. Operational Risk Mentoring, 2015, *South Bates (Whybrow Seam) Underground Mine – Longwalls 11 to 13 Subsidence Risk Assessment Report*. Document ORMJ1408, October 2015.
5. Wambo Coal Pty Ltd (WCPL), 2003, *Wambo Development Project Environmental Impact Statement* (Wambo Development Project EIS).
6. Wambo Coal Pty Ltd (WCPL), 2005, *Wambo Development Project Wambo Seam Underground Mine Modification Statement of Environmental Effects*. Document No. SEE-01-1, January 2005.
7. WCPL, 2010, *Environmental Management System: Groundwater Monitoring Program*. Rev No. 5, January 2010.
8. WCPL, 2015, *South Bates Underground Mine Water Management Plan Longwalls 11-13*. Revision A, September 2015.
9. Australian Mining Engineering Consultants, 2000. *The Influence of Subsidence Cracking on Longwall Extraction beneath Water Courses, Aquifers, Open Cut Voids and Spoil Piles*. Australian Coal Association Research Program (ACARP) Report C5016, August 2000.

Previous Studies

Background

Substantial coal mining activity has occurred historically and is continuing currently in the vicinity of Wambo, by a number of companies, with development across several coal seams. Coal is extracted by means of both underground and open cut mining methods. Coal mines neighbouring Wambo include United Colliery to the north and east of Wambo, Mt Thorley Warkworth to the south-east, and a number of open cut and underground mines to the north and east within the Hunter Valley Operations (**Figure 2**).

Historical mining at Wambo has involved four seams in the open cuts - Whybrow, Redbank Creek, Wambo and Whynot. WCPL operates five open cut pits: Bates; Bates South; Wombat; Homestead and Montrose. Underground mining has involved recovery from the Wambo and Whybrow seams. The Whybrow seam was mined at the Homestead underground mine between 1979 and 1999, and in the Wollemi underground mine between 1997 and 2002. The North Wambo Underground Mine commenced production (with Longwall 1) in October 2007.

Underground mining has occurred both above and below the Wambo Seam currently being mined by WCPL in the North Wambo Underground Mine. The adjacent United Colliery mined the lower Arrowfield Seam until 2010 (United Underground Mine).

Hydrogeology

As part of the North Wambo Underground Mine Modification assessment, Heritage Computing (HC) prepared a groundwater assessment for Wambo in 2012 (HC, 2012). This assessment showed that the hydrogeological regime of the Wambo Coal Mine area comprises two main systems:

- a Quaternary alluvial aquifer system of channel fill deposits associated with Wollombi Brook, North Wambo Creek, Wambo Creek and Stony Creek; and
- underlying Permian strata of low permeability and very low yielding to essentially dry sandstone and lesser siltstone and low to moderately permeable coal seams which are the prime water bearing strata within the Permian sequence.

The flow in North Wambo Creek has been altered by the historical and existing mining operations including the removal of alluvium across the full width of the channel with consequent desaturation of the adjacent upstream and downstream alluvium. A section of North Wambo Creek has been diverted around the open cut pits.

Historical and ongoing open cut and underground mining within the Wambo area (including adjoining mining operations) has created significant groundwater sinks and this has generated a regional zone of depressurisation within the Permian coal measures.

Subsidence

Potential subsidence impacts to the creeks and watercourses directly above Longwalls 11 to 13 have been assessed by MSEC (2015). The maximum predicted additional subsidence is 1.95 m (MSEC, 2015).

The north-eastern ends of Longwalls 11 to 13 will pass beneath the North Wambo Creek diversion. MSEC (2015) anticipates approximately 75 millimetre per metre (mm/m) of tilt, curvatures greater than 3 km^{-1} and tensile and compressive strains greater than 30 mm/m along the North Wambo Creek diversion.

The south-western corner of Longwall 13 will pass beneath Stony Creek. Only minor subsidence (approximately 400 mm vertical subsidence and 1 mm/m tensile and compressive strains) is expected along Stony Creek (MSEC, 2015).

Surface cracking has been about 25-50 mm at previously extracted North Wambo longwalls, with a maximum in the order of 150 mm (MSEC, 2015).

Above Longwalls 11 to 13 in the Whybrow Seam, the depth of cover is 54 m to 470 m. MSEC (2015) concludes it "*is not expected that there would be a hydraulic connection between the surface and seam over the majority of the longwalls, as none was observed after the extraction of the first seven longwalls at the NWUM, which were extracted directly beneath North Wambo Creek at a depth of cover of around 100 metres. It is possible that hydraulic connection between the surface and seam could develop above the finishing (i.e. north-eastern) ends of the longwalls, where the depths of cover are less than 100 metres…"*

It follows that groundwater levels are likely to be lowered temporarily by strata dilation due to subsidence deformation.

The depth of cover above the Whybrow Seam at the North Wambo Creek diversion is approximately 64 m to 80 m and there would be an enhanced hydraulic connection between the seam and the surface in this location.

Australian Mining Engineering Consultants (2000) presented measured inflow rates at and adjacent to German Creek and Oaky Creek Longwall Mines in the period from 1986 to 1997. Measured inflow rates from surface water sources are summarised in **Table 1**.

Table 1 Measured Inflow Rates at German Creek and Oaky Creek Mines

MINE	DATE	OVERBURDEN THICKNESS (m)	MEASURED INFLOW RATES (L/s)	WATER SOURCE	COMMENTS
Central Colliery	1986	70	25	Tieri Sill Aquifer	Initial flow 25 L/Sec, Reducing to 9 L/Sec after 35 days.
Southern Colliery	December 1990	70	140	Pit E surface run-off in final void	Flow down tension cracks in pit floor.
Southern Colliery	September 1991	130 - 140	27	German Creek	Subsidence trough above 603 Panel prior to removal works.
Southern Colliery	December 1993	150 - 160	30	German Creek	Subsidence trough above 604 Panel prior to removal works. Permian rock exposed in creek bed.
Southern Colliery	January 1994	120	45	Cattle Creek	Subsidence trough above 604 Panel prior to remedial works. Eddies above tension cracks.
Oaky No. 1 Underground Mine	January 1996	100 - 168	190	Sandy Creek Diversion Channel Talagai Pit Talagai Spoil Piles	40 L/Sec 89 L/Sec 61 L/Sec
Oaky No. 1 Underground Mine	January 1997	150 - 168	17	Sandy Creek Diversion Channel	From three longwall troughs.

Source: Australian Mining Engineering Consultants (2000).

In addition to the work conducted by Australian Mining Engineering Consultants (2000), mining was conducted under Wambo Creek at similar depths of cover at the nearby Homestead Mine in Longwalls 9 and 9A in the Whybrow Seam. A large flow event in Wambo Creek occurred while mining was occurring in Longwall 9 immediately below the creek. Coffey (2000) reported “a maximum of about 200 L/s of surface flow was being transferred to the mine”.

Subsequent flow monitoring was conducted during the period when Longwall 9A was undermining the creek. This involved pumping water from Wollombi Brook at a measured rate to an un-subsided area between Longwalls 9 and 9A. Outflow to Wollombi Brook, which was monitored by means of a weir, stabilised at 12.4 to 14.1 L/s (1.1 to 1.2 ML/day).

A guide to the potential enhanced vertical hydraulic conductivity (K) has been estimated based on reported inflows by Australian Mining Engineering Consultants (2000) and Coffey (2000). The highest inflow reported by Klenowski was approximately 16 ML/day (190 L/s), and the reported inflow to the Homestead Mine was approximately 17 ML/day (200 L/s).

The portion of Wambo Creek above the Homestead Mine Longwalls 9 and 9A is approximately 500 m long. Assuming a channel width of approximately 5 m, the effective vertical K would have been approximately 7 m/day.

For North Wambo Creek diversion above the South Bates Underground Mine, using a reach of 250m (above one longwall), a channel width of 5m, and a conservative K of 10 m/day, the estimated inflow would be approximately 12.5 ML/day.

It is noted that the vertical K would reduce as sediments flow into subsidence cracks and following remediation.

Groundwater Modelling

The groundwater assessment by HS (2015) included numerical modelling (using MODFLOW-SURFACT software) to assess the potential cumulative impacts on regional and local groundwater resources of the approved South Bates Longwalls 11 to 13, North Wambo Longwalls 1 to 10A and surrounding mining operations. This model allowed description of any expected/predicted change to potential environmental consequences for groundwater resources and groundwater dependent ecosystems in comparison to the potential environmental consequences described in the *Wambo Development Project Environmental Impact Statement* (Wambo Development Project EIS) (WCPL, 2003) and *Wambo Development Project - Wambo Seam Underground Mine Modification Statement of Environmental Effects* (North Wambo SEE) (WCPL, 2005).

The model domain is discretised into 1,945,600 cells comprising 320 rows, 380 columns and 16 layers. The dimensions of the model cells are uniformly 50 m in both lateral directions. The model extent is 16 kilometres (km) from west to east and 19 km from south to north, covering an area of approximately 300 square km (**Figure 3**).

The layer definition within the model has allowed the mined coal seams to be represented individually. A single layer of overburden separates each coal seam in the model. The target Whybrow coal seam is layer 3 in the model. The model uses a conservative estimate of about 170 m for the fractured zone height (0.67 times the panel width of 250 m). As the depth of cover for the Whybrow Seam across the entire South Bates Underground Mine varies from 54 m to 470 m, fracturing was modelled to reach ground surface over the north-eastern portion of the mine footprint.

Transient calibration against groundwater levels was carried out for the period January 2003 to December 2009 which includes the period when North Wambo Underground Mine Longwalls 1 and 2 were mined (HC, 2012). Available data from early 2010 was then used to validate the stress response of extraction by Longwalls 3 and 4. The achieved calibration performance measures were 6.6% Scaled Root Mean Square (SRMS) for the calibration period and 6.0% SRMS for the verification period (HC, 2012).

Risk Assessment

A risk assessment, facilitated by Operational Risk Mentoring at Wambo Coal Mine on 27 August 2015, included the participation of the author of this groundwater assessment review. The scope of the risk assessment workshop was (Operational Risk Mentoring, 2015):

> *To conduct a risk assessment with an emphasis on identifying those subsidence impacts with high-risk levels and/or potentially severe consequences. To confirm that adequate risk treatment measures are applied such that the residual risk ranking is tolerable*.

Although several groundwater issues were identified, the only priority loss scenarios identified in the risk assessment were (Operational Risk Mentoring, 2015):

> *Failure of the monitoring program to detect and respond to an impact on the groundwater system.* (Rank D4 – Broadly Acceptable)
>
> *Boundary faults result in differences between modelled and observed groundwater drawdown (possibly conservative at a distance, but inaccurate locally).* (Rank D5 – Broadly Acceptable)

As a result of the risk assessment, the groundwater monitoring program in the vicinity of the South Bates Underground Mine was reviewed and new monitoring sites installed as an additional control measure.

Lower priority issues of relevance identified and tabulated by Operational Risk Mentoring (2015) are:

1. Induced leakage from Stony Creek resulting from a lowering of the water table associated with the extraction of Longwalls 11 to 13. (Rank D5)
2. Reduced base flow to North Wambo Creek resulting from a lowering of the water table associated with the extraction of Longwalls 11 to 13. (Rank D5)
3. Induced leakage from North Wambo Creek Diversion due to subsidence. (Rank D3)

No follow-up actions that were not already completed, relevant to groundwater, were identified.

Data Analysis

Groundwater Monitoring

Groundwater monitoring at Wambo is undertaken in accordance with the Groundwater Monitoring Program (GWMP) (WCPL, 2010). The objectives of the GWMP are to establish baseline groundwater quality and water level data and to implement a programme of data collection that can be utilised to assess potential impacts of mining activities on the groundwater resources of the area.

The Wambo groundwater monitoring network currently consists of approximately 40 monitoring sites (**Figure 4**). A network of monitoring bores has been established in the alluvial aquifers associated with the principal drainage pathways, as well as multi-level vibrating wire piezometers (VWPs) installed within the Permian groundwater system.

Consistent with the GWMP, groundwater quality sampling has been undertaken by WCPL in accordance with AS/NZS 5667.11:1998 – *Guidance on Sampling of Ground Waters*. Samples are measured in the field for acidity (pH), electrical conductivity (EC) and temperature (T).

Key Monitoring Bores

The key monitoring bores for this groundwater assessment are:

- GW16 and GW17 – in alluvium on North Wambo Creek, about 2 km north;
- GW19 - in alluvium over Longwall 11 (always dry);
- GW21 – in interburden about 200 m from the centre of Longwall 13;
- P311 - in interburden over North Wambo Underground Mine Longwall 1, about 500 m south;
- GW20 – a multi-level VWP array adjacent to the north-eastern end of Longwall 13 and the North Wambo Creek diversion.

An additional three bores have been drilled in the past few months to supplement the monitoring network in the vicinity of South Bates. The sites are tentatively named N2, N3 and N5.

Two discontinued monitoring bores also provide useful baseline information:

- P5 - in alluvium over North Wambo Underground Mine Longwall 1; and
- P6 - in alluvium over North Wambo Underground Mine Longwall 2.

Figure 5 displays the groundwater level hydrographs at P5 and P6, and long-term trends by applying an 11-point smoothing window (approximately 1 year), compared with the rainfall residual mass curve (RMC) since 2005, and with the commencement dates for each longwall panel. The RMC is a filtered version of the monthly rainfall record which suppresses spiky rainfall events and enhances long-term trend information. During a wetter than normal period, the curve climbs. Conversely, the curve falls during a drier than normal period. If rainfall is the primary driver for groundwater level dynamics, the groundwater hydrographs can be expected to follow a similar trend. The water table at P5 and P6 responds rapidly and with high amplitude (2-4 m) to rainfall events. There is very good correlation between the two groundwater curves and the RMC until mid-2012, at which time a mining effect can be seen. This would not be due to extraction of Longwall 5 at that time, but would be due to open cut mining approaching from the north-west (**Figure 3**).

At January 2013, the open cut face was about 400 m from P5. Both hydrographs show a decline in water level during the passage of Longwall 1 and Longwall 2, when rainfall was close to average conditions. Following this decline these bores have recovered during wetter conditions. The early decline is indicative of a mining effect on water level due probably to enhanced leakage of water from the alluvium to the underlying Permian rocks and it is noted that this mechanism is consistent with the potential impacts described in the Wambo Development Project EIS and the North Wambo SEE. The alluvium still maintained sufficient water and had not been dewatered by mining.

Both P5 and P6 groundwaters freshened with time, as illustrated by the EC responses in **Figure 6**. The alluvial water moved into a better beneficial use category from 3,000-4,000 microsiemens per centimetre (µS/cm) at the commencement of Longwall 1 to less than 1,000 µS/cm at September 2012. For the full period of record, the groundwater EC has been less than 1,000 µS/cm at P5 for about 15% of the time and at P6 for about 40% of the time. The EC trends suggest replenishment by good quality water beyond what occurred pre-mining. The mechanism would be either increased rainfall recharge or reduced upflow of more saline groundwater into the alluvium in response to mining. The mechanism of increased rainfall recharge is consistent with the period of above average rainfall indicated by the RMC (**Figure 6**).

The pH condition of the groundwater at P5 and P6 was very stable before mining and during mining. There have been variations of up to 1 pH unit that bear some correlation with rainfall trends.

Figure 7 displays fluctuating and smoothed groundwater level hydrographs at GW16 and GW17, as well as the RMC and the commencement dates for each longwall panel. The data on **Figure 7** show that the water tables at GW16 and GW17 have responded rapidly and with high amplitude (2-4 m) to rainfall events. Both hydrographs show correlation with the RMC until mid-2012, after which a decline in water levels occurred despite wetter than average conditions. The decline is due to nearby open cut mining. Based on the smoothed data on **Figure 7**, drawdowns from mid-2012 to 2015 have been about 2 m at GW17 and about 3 m at GW16.

Although bores GW16 and GW17 are only 250 m apart, and both are alongside North Wambo Creek, their salinities are quite different (**Figure 8**). The water at GW16 has always been less than 1,000 µS/cm while the water at GW17 is typically about 5,000 µS/cm.

In the Permian coal measures, a mining effect is evident at P301 (situated over Longwall 6) from the commencement of Longwall 3 (**Figure 9**). Although P311 has only a short period of record, it is likely to have had a similar trend to that observed at P301 except the mining effect would have occurred earlier when Longwall 1 passed by.

A similar mild mining effect is likely at GW21 adjacent to Longwall 13 (**Figure 10**).

Interburden salinities are also quite variable in magnitude and temporal pattern. Bores P301 and P311, sited adjacent to Stony Creek, initially had EC values of 7,000-9,000 µS/cm (**Figure 11**). The measurements at P301 dropped suddenly to about 2,000 µS/cm when the RMC started to rise in 2007, fluctuated between 500 µS/cm and 4,000 µS/cm until 2012, and then rose gradually to about 6,000 µS/cm. Although Bore GW21, being dry more often than not, has had limited sampling, initial values suggest very high groundwater salinity (about 16,000 µS/cm) (**Figure 12**).

Groundwater Modelling Results

The groundwater model developed using MODFLOW-SURFACT software (HS, 2015) has been used to predict responses to South Bates Underground Mine extraction of coal from the Whybrow Seam for Longwalls 11 to 13 for a three-year period (notionally January 2015 to December 2017). Of most relevance to this groundwater assessment are the predicted drawdowns in model layer 1 for the alluvium and the regolith at the end of Longwall 13. The predicted drawdowns are cumulative as they include the effects of concurrent open cut mining and the final stages of the United Underground Mine in a deeper coal seam.

Figure 13 shows the predicted cumulative drawdown in alluvium and regolith following completion of Longwall 13. Due to the cumulative impacts of approved mining, shallow drawdowns in alluvium and regolith from the commencement of the South Bates Underground Mine are expected to reach about 10 m at the north-eastern end of the mine layout. This is partially due to fracturing to land surface but primarily due to adjacent open cut mining. Negligible drawdown is anticipated over the western half of the mine layout and in the vicinity of Stony Creek. There are no private registered bores within the ambit of South Bates if it were to act alone. Therefore, there are no private bores likely to be affected by 2 m drawdown or more (a minimal harm consideration of the Aquifer Interference Policy).

HS (2015) presents a discussion of the changes in baseflow in North Wambo Creek predicted to occur at the completion of Longwall 13. North Wambo Creek was shown to behave as a gaining stream on average with a fluctuation in baseflow of about 0.01 ML/day. This change in baseflow is considered to be negligible. In the vicinity of South Bates, there is an expectation of enhanced leakage from the diversion if the creek happens to flow at the same time or shortly after the passage of Longwalls 11 to 13 beneath the creek. In the model, the diversion has been simulated as an ephemeral drain and the scenario of occasional high flows is not examined as part of the numerical model, however has been discussed further above.

There is a series of north-northeast to south-southwest trending faults within and adjacent to the South Bates Underground Mine area with throws between 0.5 m and 1 m (MSEC, 2015). Some larger faults have been identified to the north-west and to the south-east of the South Bates Underground Mine with throws ranging between 3 metres and 12 metres (MSEC, 2015). These faults may result in some confinement of groundwater drawdown, which would make the numerical model predictions somewhat conservative at a distance, with some potential for local differences directly above the longwall panels.

Conclusion

The key findings of this groundwater assessment review are:

1. It is not realistic to assess the drawdown caused by the South Bates Underground Mine acting alone, as the groundwater responses are affected significantly by adjacent open cut and longwall mining.

2. Shallow drawdowns in alluvium and regolith from the commencement to the completion of the South Bates Underground Mine are expected to reach about 10 m at the north-eastern end of the mine layout, in the vicinity of the North Wambo Creek diversion.

3. Negligible drawdown is anticipated over the western half of the South Bates Underground Mine layout and in the vicinity of Stony Creek

4. Nearby monitoring bores P5 and P6 in the North Wambo Creek alluvium have experienced freshwater recharge at a rate higher than occurred pre-mining. This could be due to higher rainfall recharge through surficial cracking or reduced upflow of more saline groundwater. A similar response is likely where Longwalls pass beneath the North Wambo Creek diversion.

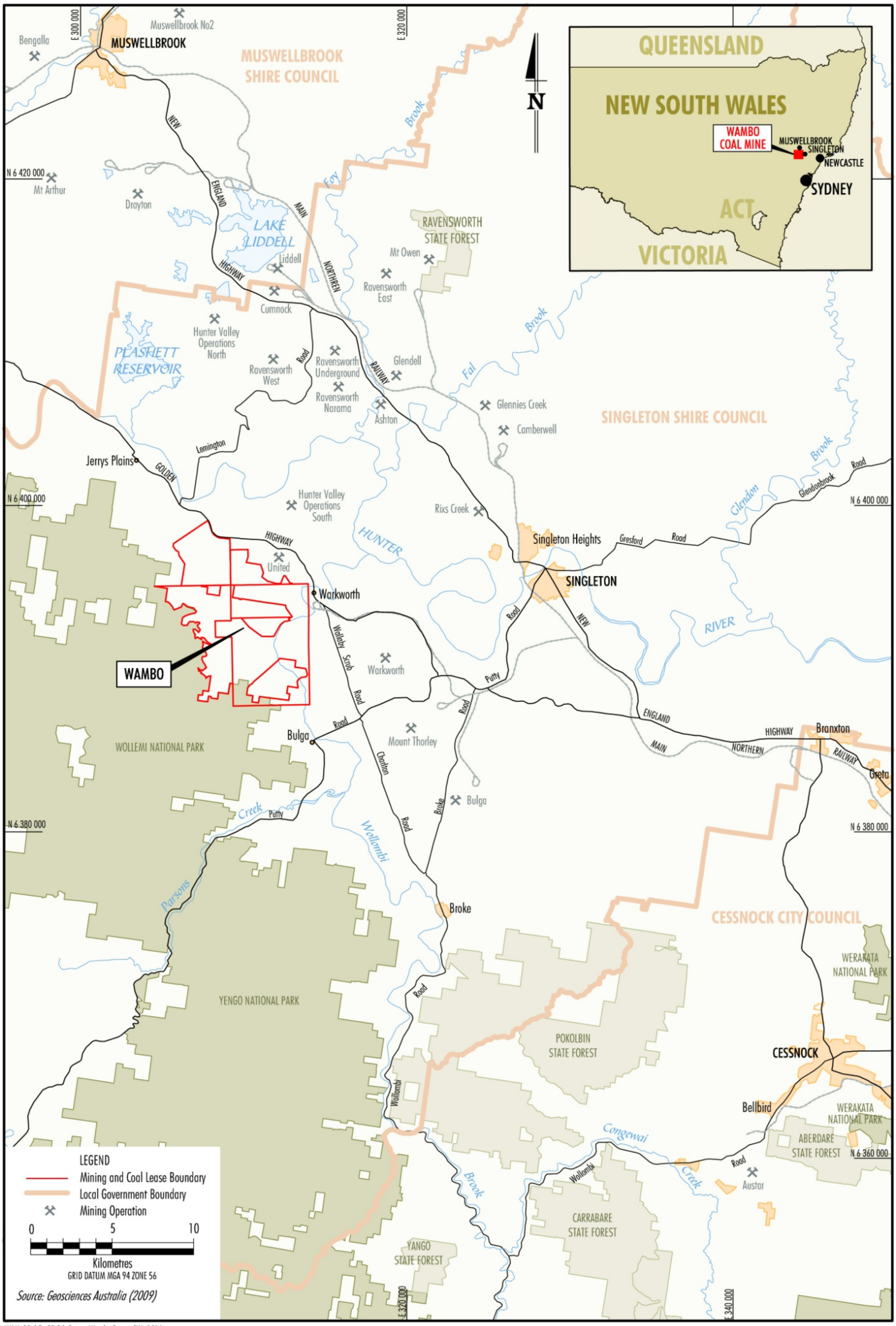
5. There is an expectation of enhanced leakage from the North Wambo Creek diversion if the creek happens to flow at the same time or shortly after the passage of Longwalls 11 to 13 beneath the creek.

6. There are no private registered bores within the ambit of South Bates if it were to act alone. Therefore, there are no private bores likely to be affected by 2 m drawdown or more (a minimal harm consideration of the Aquifer Interference Policy).

This data analysis, based on currently available records, has shown that there are no predicted material impacts from longwall mining beyond what was foreseen for the cumulative impacts described in the North Wambo Underground Mine Modification Groundwater Assessment (HC, 2012) and the South Bates (Wambo Seam) Underground Mine Modification – Groundwater Assessment (HS, 2015). Therefore revision of the potential environmental consequences of Longwalls 11 to 13 is not required.

ENCLOSURE A

FIGURES



WAM-09-15_EP Sth Bates_Wambo Seam_GW_101A

Figure 1. Regional Location

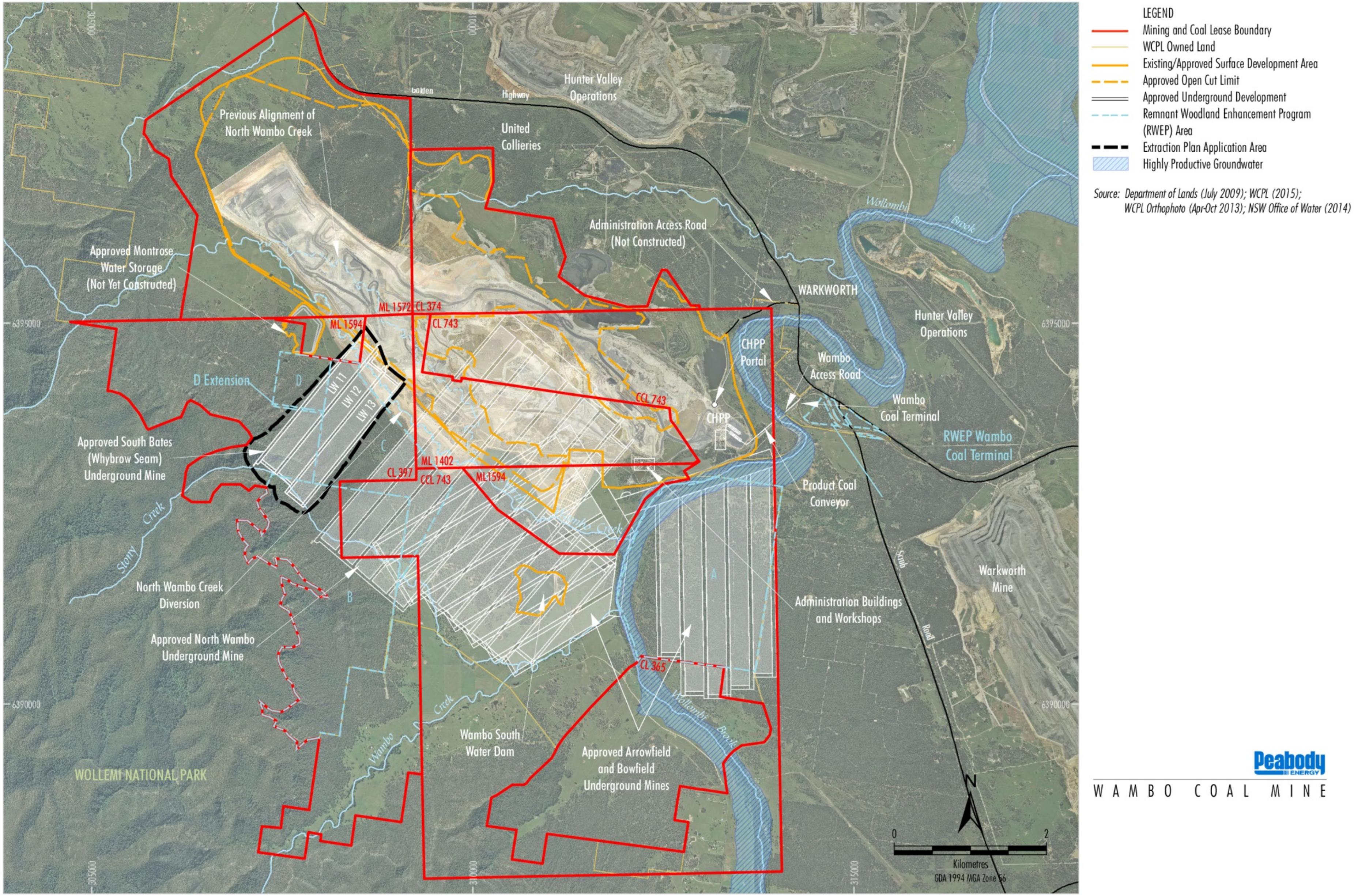


Figure 2. Plan of Mining at Wambo and Surrounds

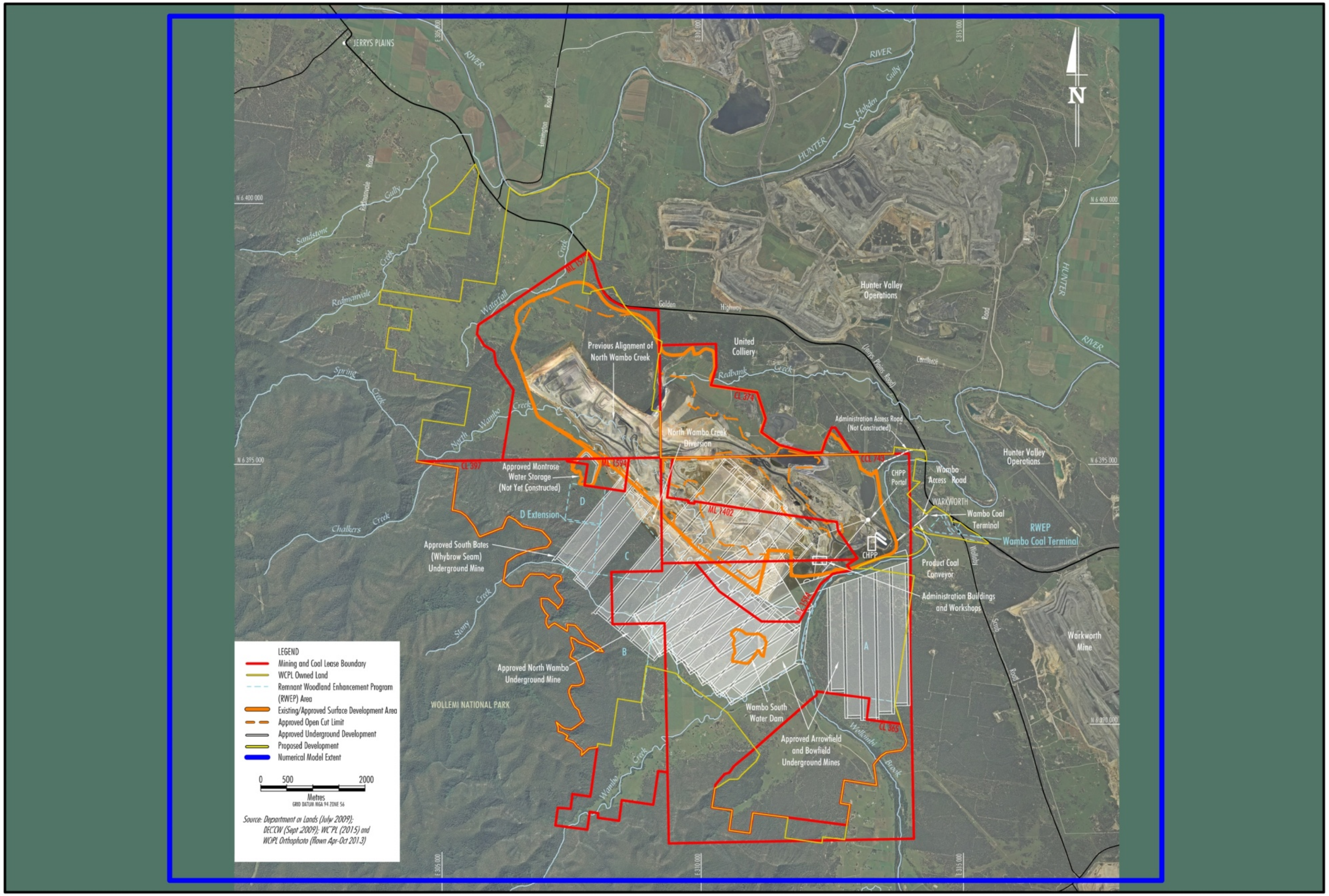


Figure 3. Model Domain

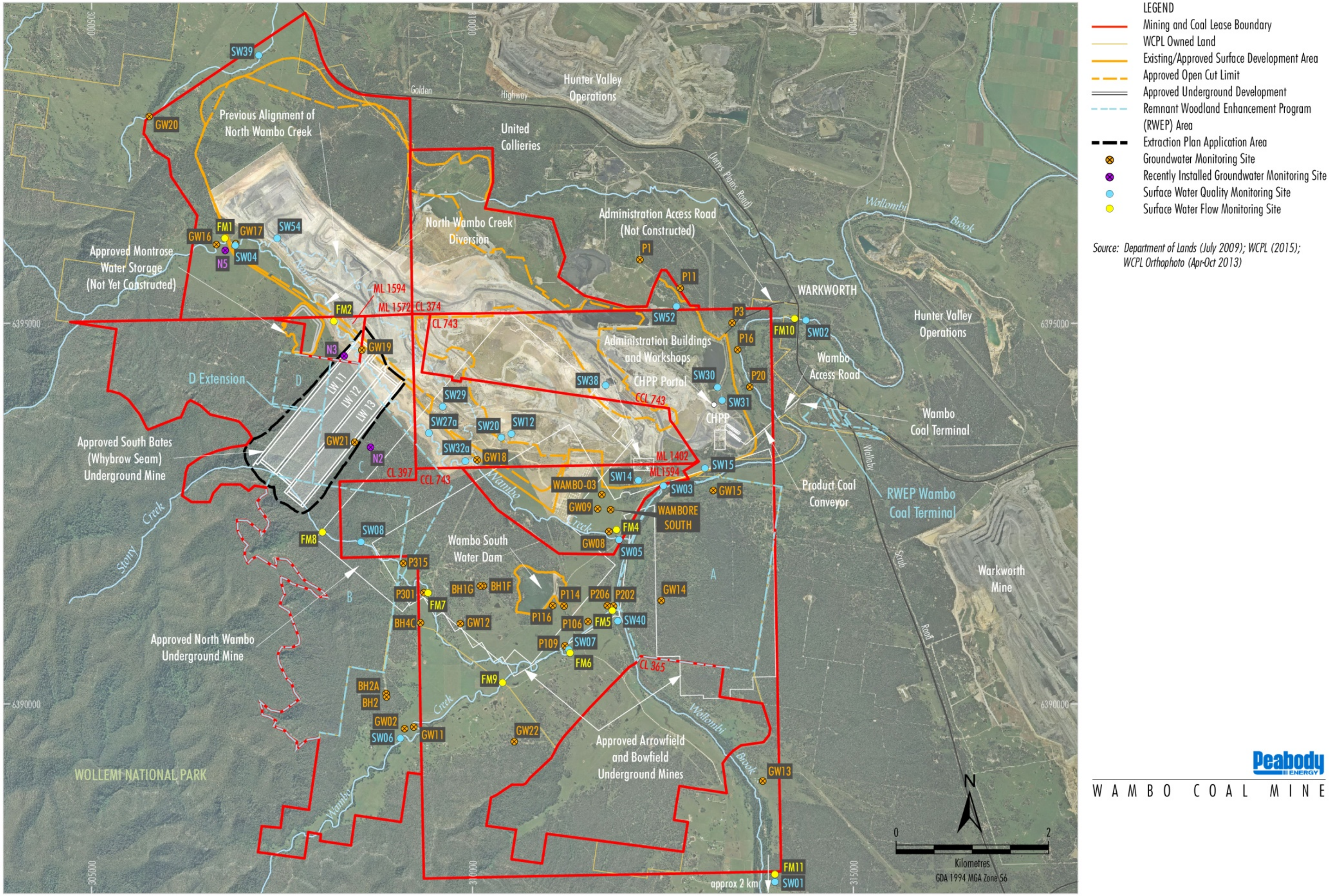


Figure 4. Groundwater Monitoring Network

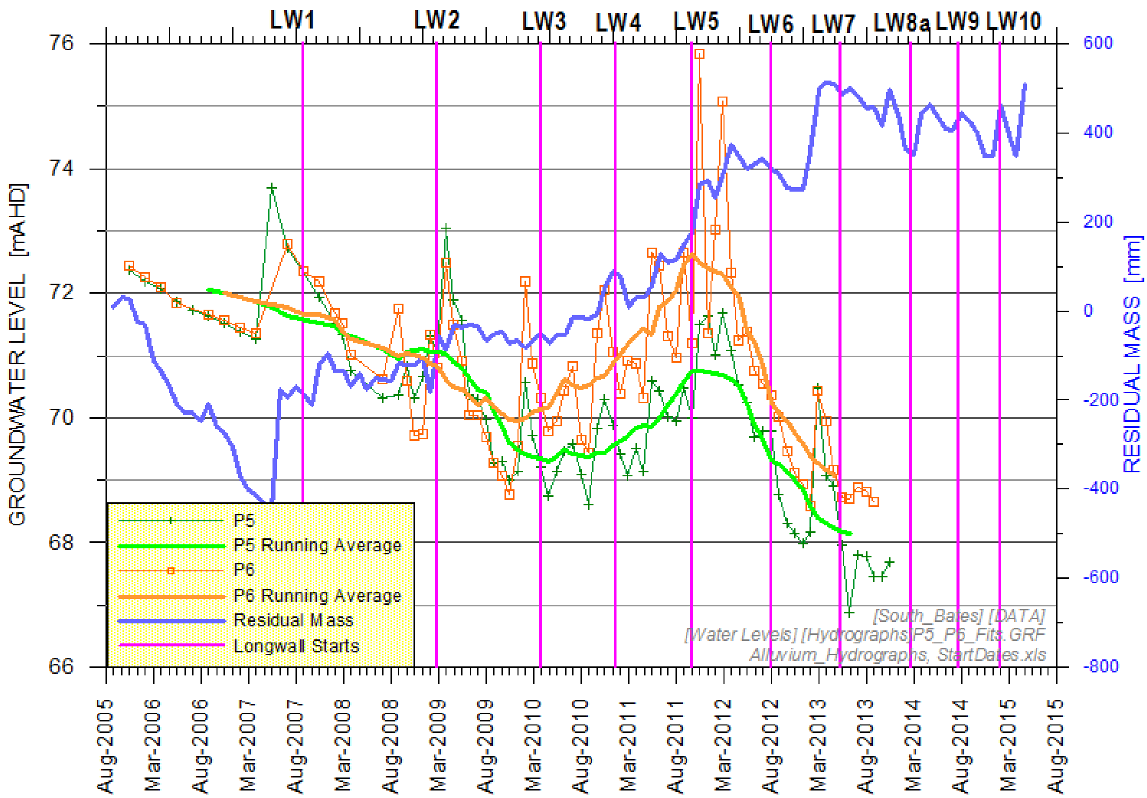


Figure 5. North Wambo Creek Observed and Smoothed Hydrographs at Monitoring Bores P5 and P6

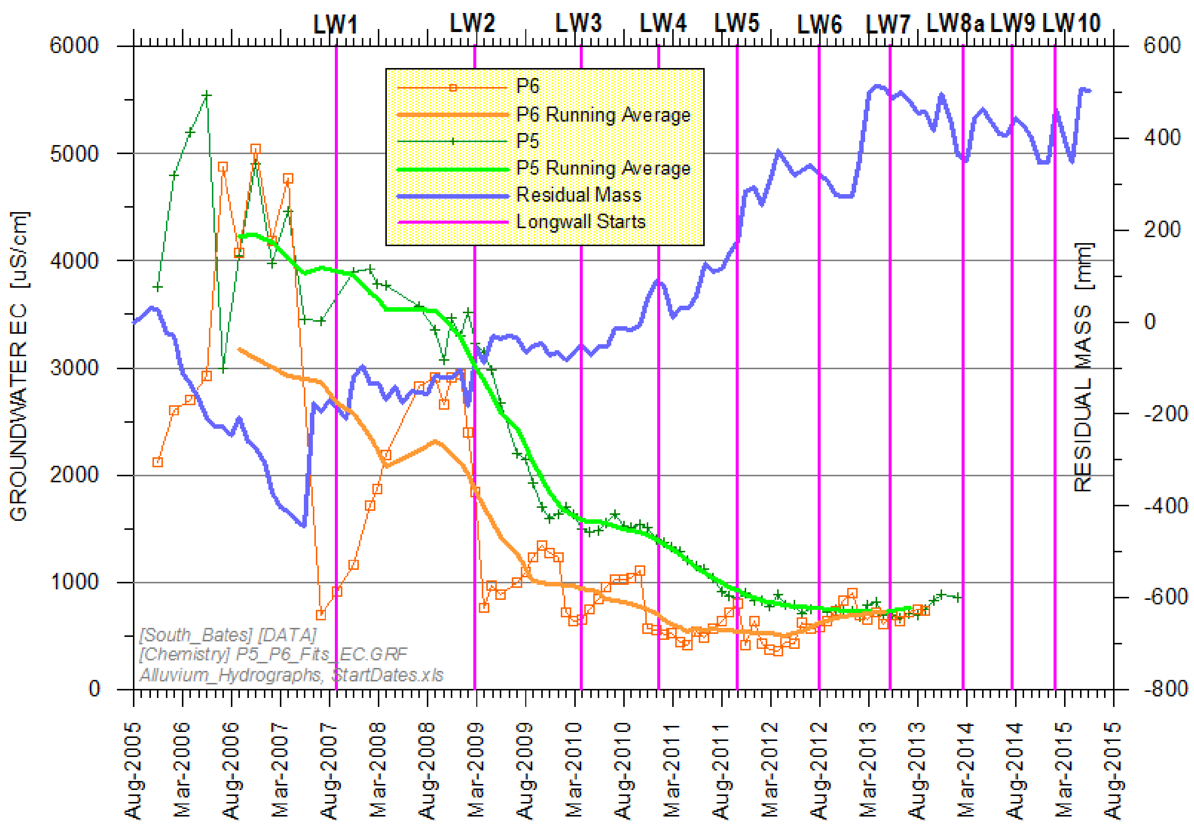


Figure 6. North Wambo Creek Smoothed EC Time-Series at Monitoring Bores P5 and P6

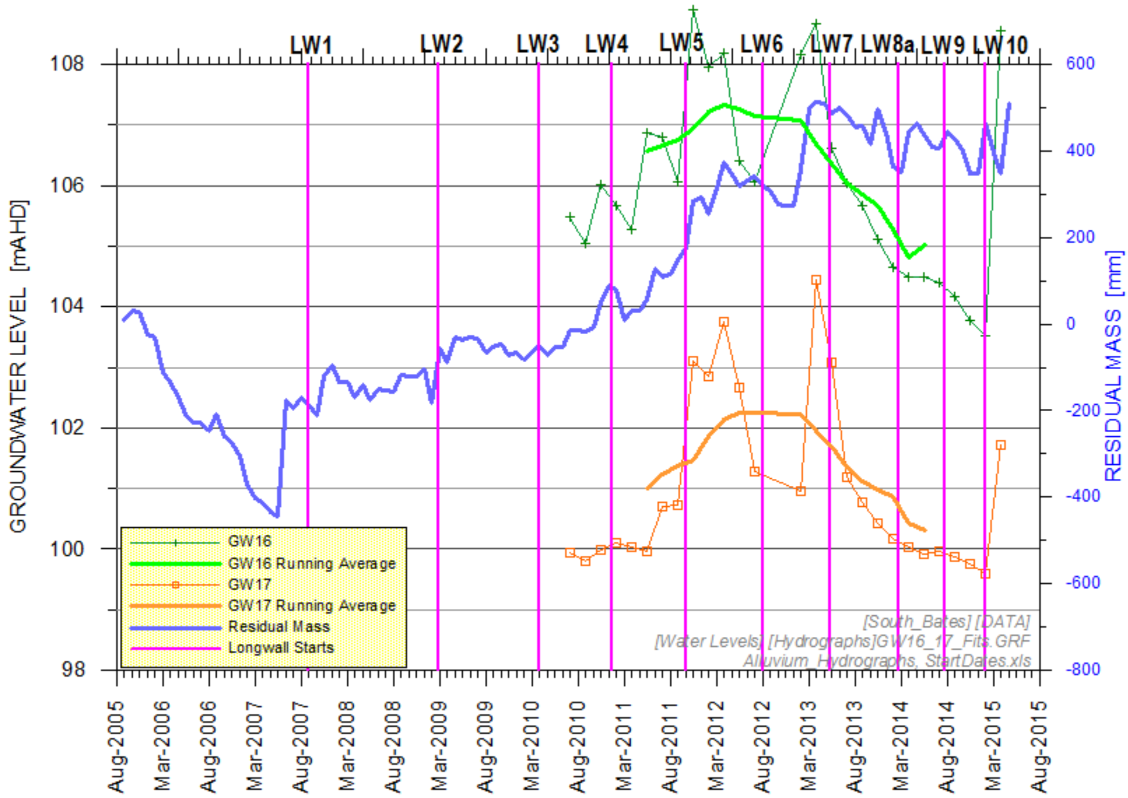


Figure 7. North Wambo Creek Observed and Smoothed Hydrographs at Monitoring Bores GW16 and GW17

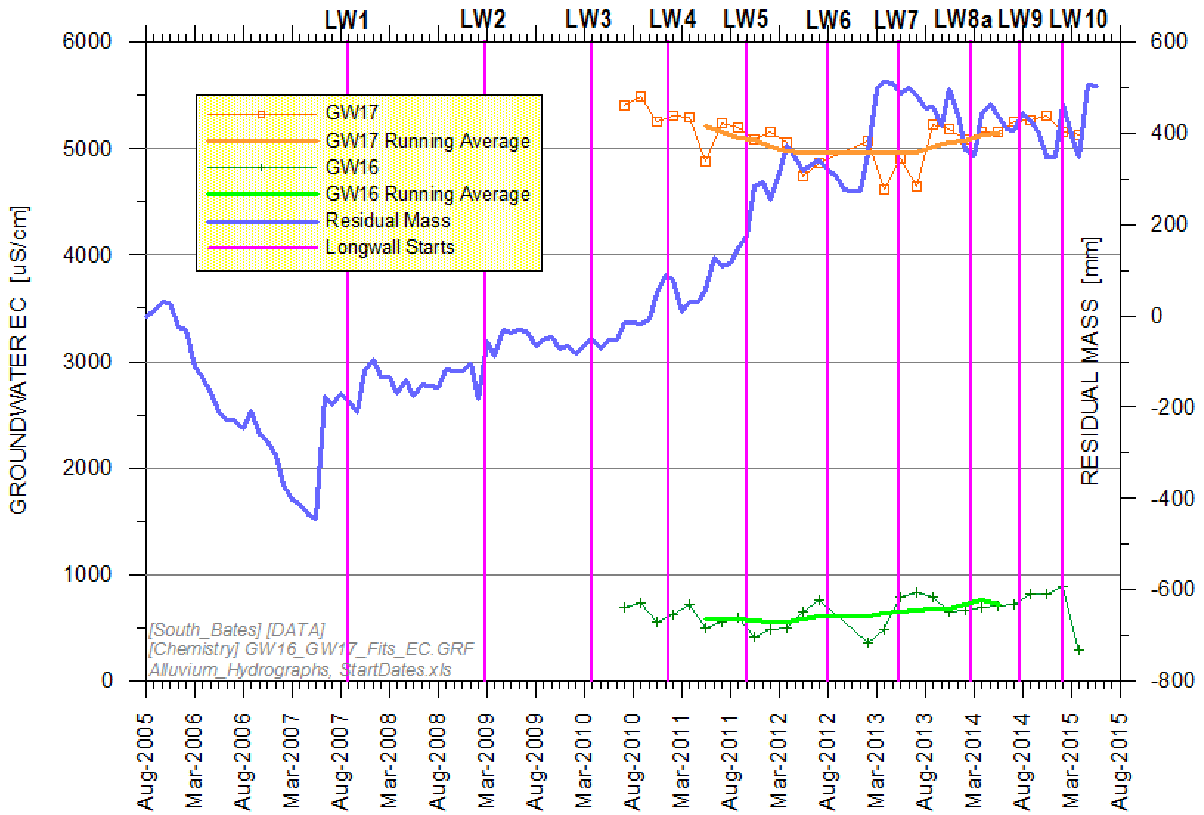


Figure 8. North Wambo Creek Smoothed EC Time-Series at Monitoring Bores GW16 and GW17

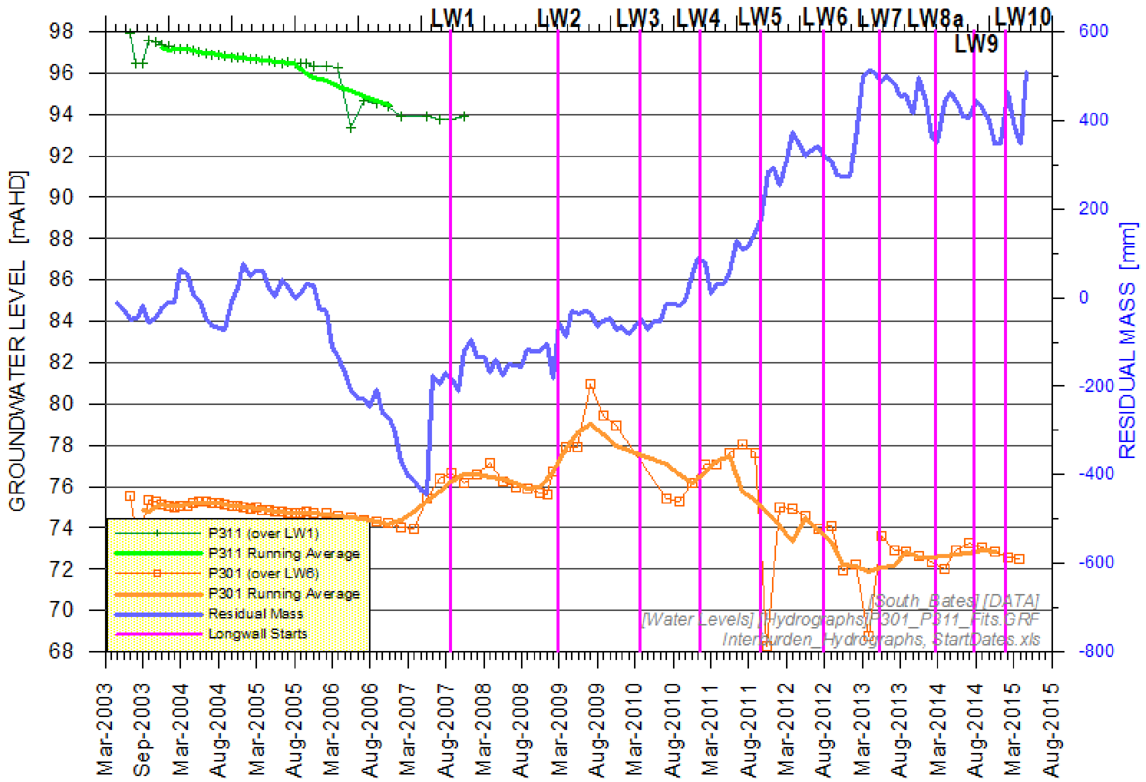


Figure 9. Interburden Observed and Smoothed Hydrographs at Monitoring Bores P301 and P311

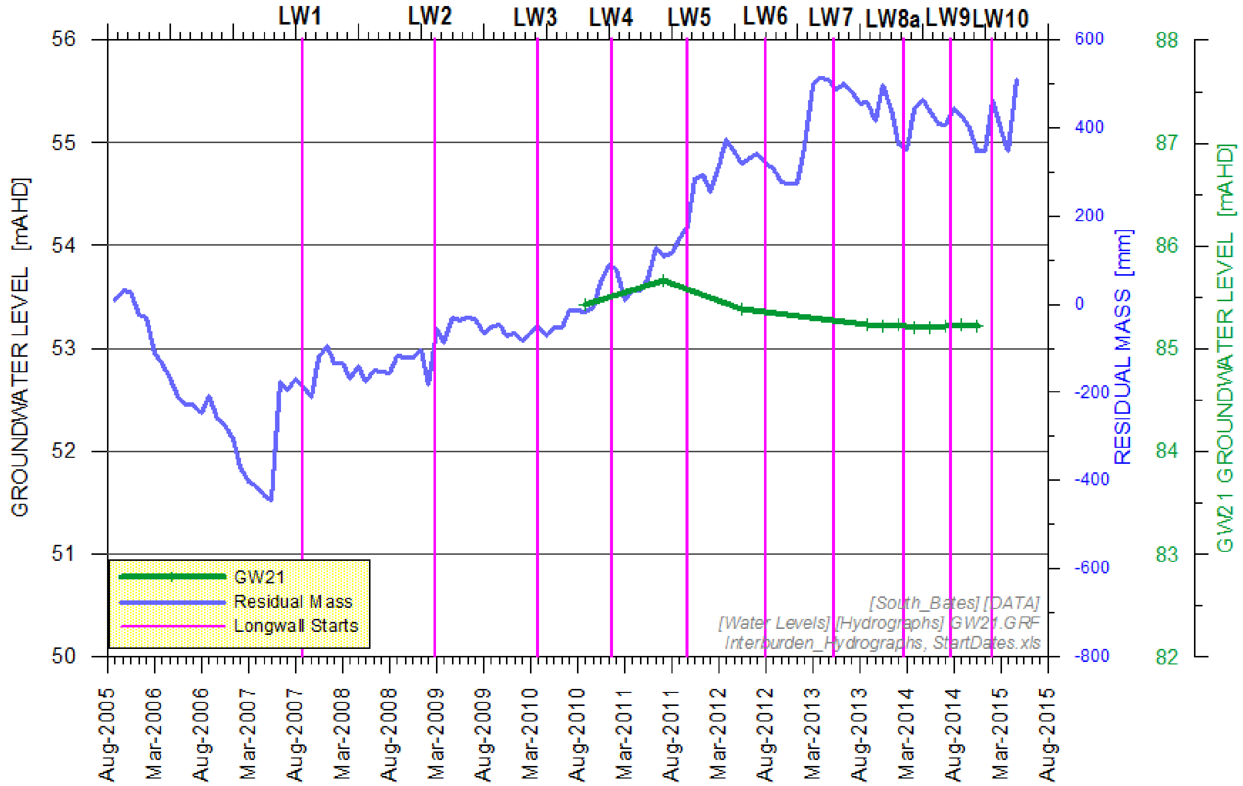


Figure 10. Interburden Observed Hydrograph at Monitoring Bore GW21

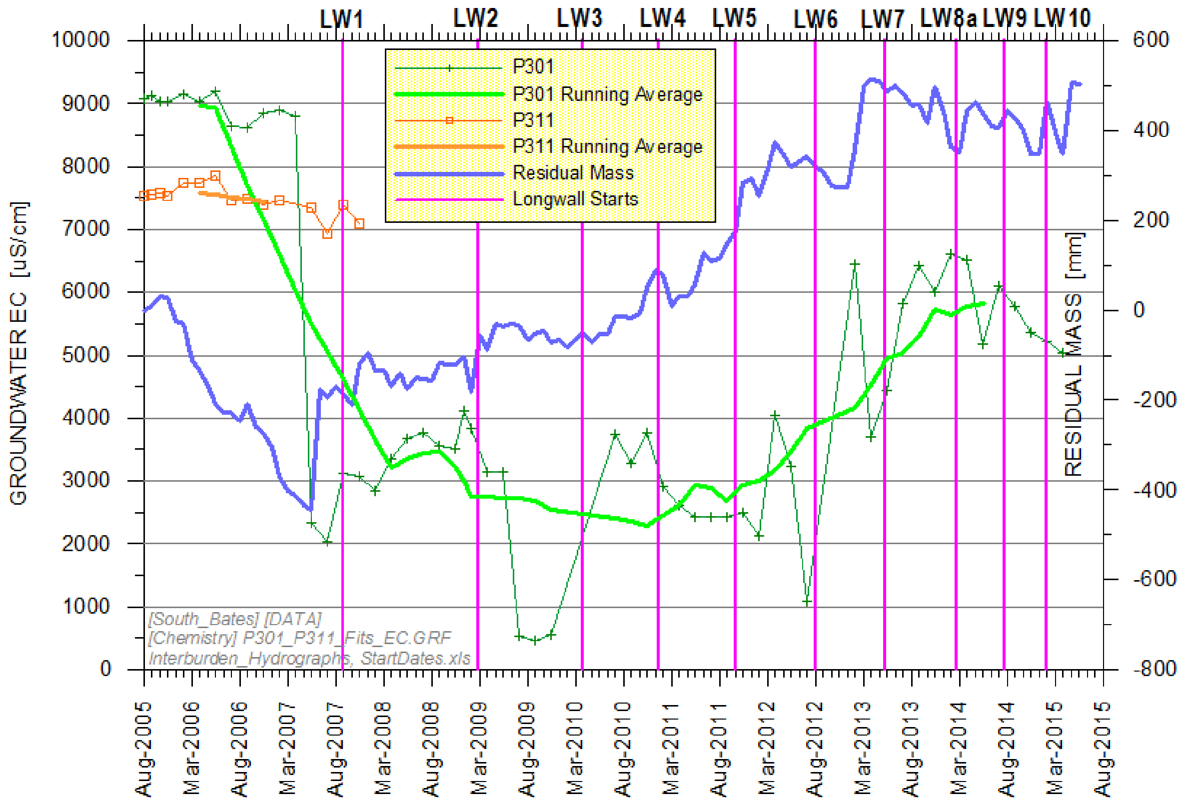


Figure 11. Interburden EC Time-Series at Monitoring Bores P301 and P311

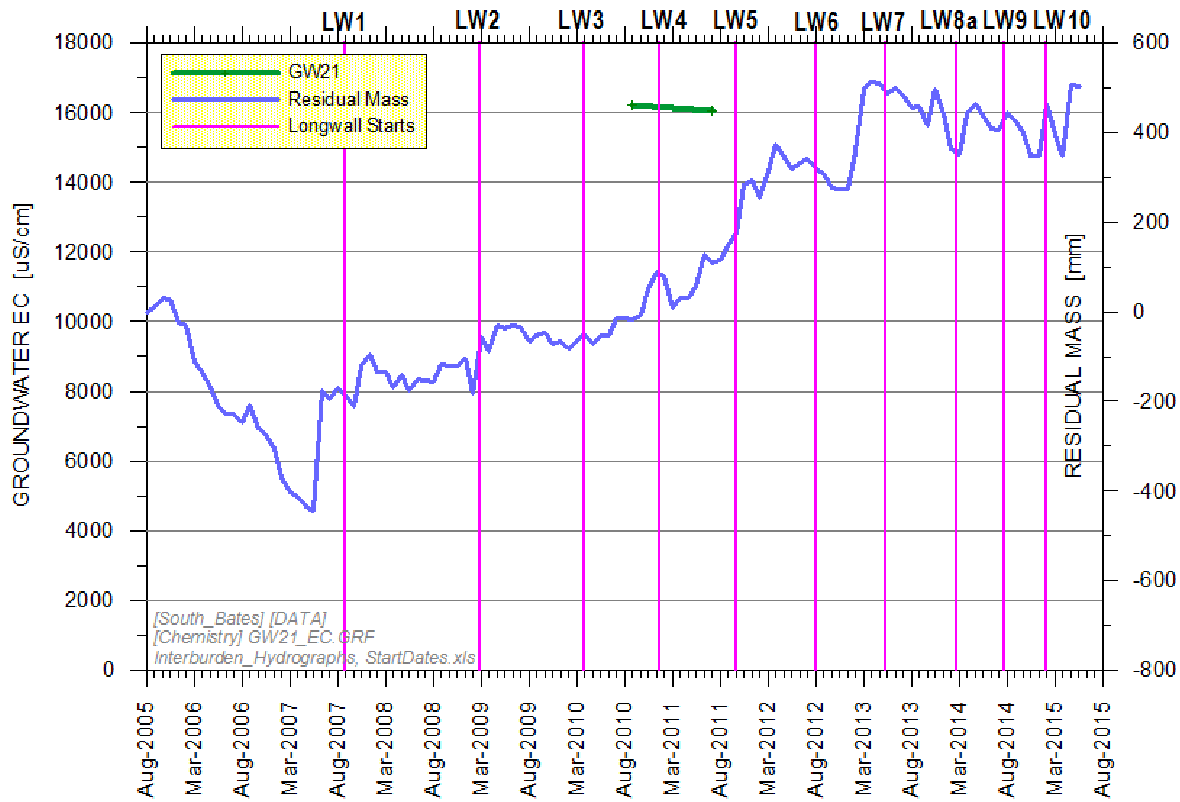


Figure 12. Interburden EC Time-Series at Monitoring Bore GW21

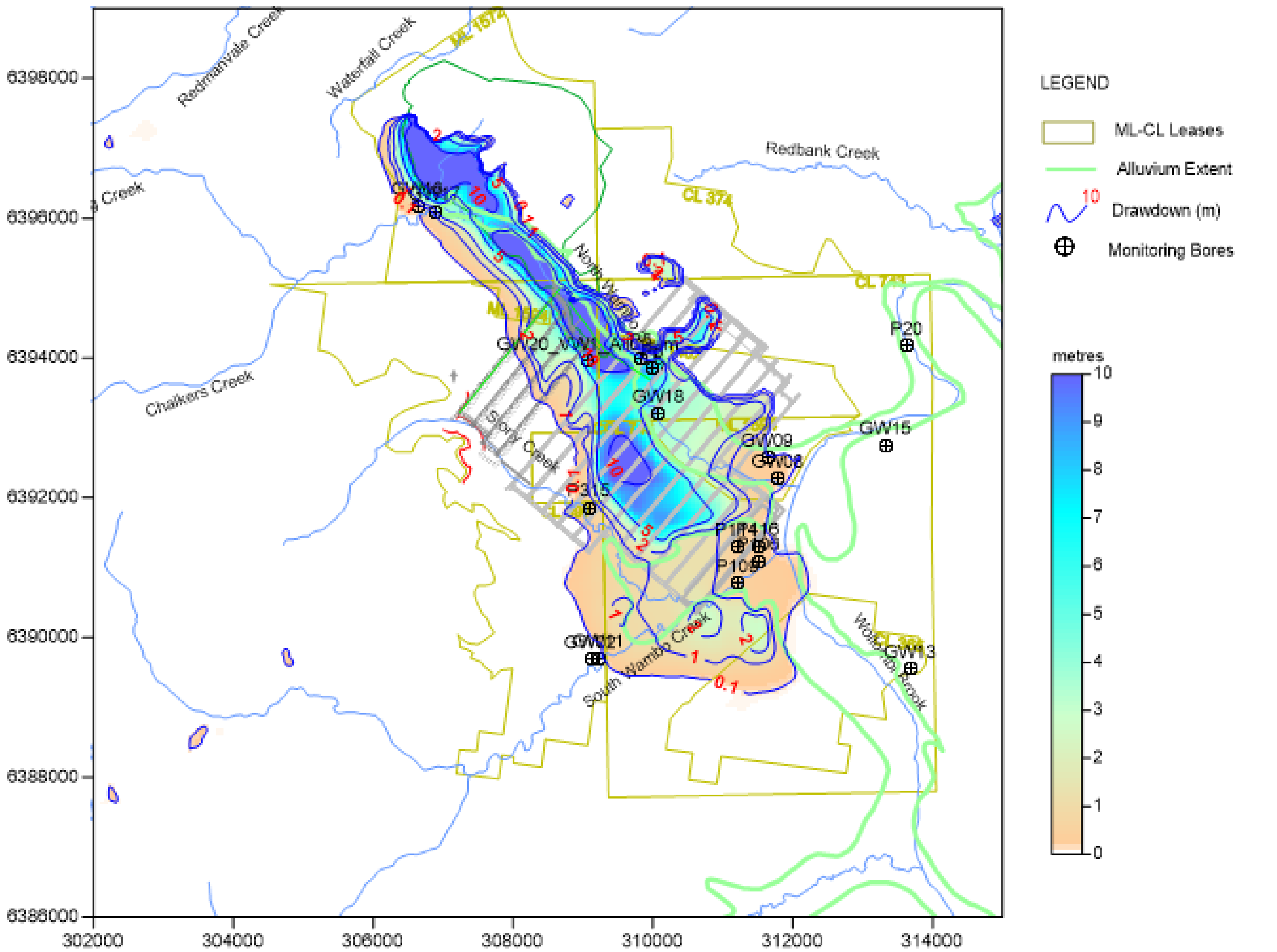


Figure 13. Cumulative Drawdown (m) in Alluvium / Regolith at the end of Stress Period 35 for Approved Mining