

TAHMOOR UNDERGROUND

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6 February 2018

Clay Preshaw
Director
Resource and Energy Assessments
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

By email: clay.preshaw@planning.nsw.gov.au

Dear Clay,

**Re: Environmental Assessment, Tahmoor Underground Modification 4, DA 67/98
Update referring to letter OUT 17/49826 from Resource Regulator 21 December 2017**

Tahmoor Colliery (*Tahmoor*) refers to the letter dated 21 December 2017 (OUT 17/49826) to Paul Freeman from the Resource Regulator. The letter was in response to the Environmental Assessment for Tahmoor Underground Modification 4 (*The Modification*), DA 67/98 date 25 October 2017 and the Development Consent by the Minister for Urban Affairs and Planning (DA 67/98), dated 25 February 1999, as subsequently amended.

Tahmoor provided an initial response to the above letter on 18 December 2017 and would like to provide a further update as outlined below.

Background

Tahmoor Colliery

Tahmoor Colliery has previously mined 30 longwalls to the north and west of the mine's current pit top location. This has provided Tahmoor with extensive experience mining directly beneath and adjacent to critical civil infrastructure. This includes the township of Tahmoor, commercial and retail buildings, Tahmoor Town Centre and the Main Southern Railway. Tahmoor has mined directly beneath over 1,800 residential structures during the extraction of Longwalls 22 to 31.

Tahmoor Colliery has been operating under the Subsidence Management Plan (SMP) process and since Longwall 22. In 2014 Tahmoor developed and submitted the *Tahmoor Colliery Longwalls 31 to 37 Subsidence Management Plan Application (LW 31-37 SMP Application)* to the then Department of Resource and Energy. Following this, extraction of Longwall 31 was approved. This is the Longwall currently being mined at Tahmoor. It is scheduled to be complete in mid July 2018.

Tahmoor is seeking to transition straight from Longwall 31 to Longwall 32 in July 2018. Development Consent (DA 67/98) is in place for Longwall 32. However the Modification is being sought to address a "no subsidence area" adjacent to Longwall 32 (Figure 2), in or to allow the extraction of the full Longwall block.

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Longwall 32 is the final Longwall block in the eastern domain at Tahmoor, prior to transitioning to the western domain.

Longwall 32 was included in the LW31-37 SMP Application. The inclusion of the SMP Application is provided in **Table 1**. The content that is now being updated and finalised in response to the Resources Regulator letter are shown in bold italics.

An overview to the inclusions in the LW31-37 SMP Application that was prepared during 2014 and submitted to the Department of Resource and Energy on 23 December 2014, is provided in **Table 1**. The content that is now being updated and finalised in response to the Resources Regulator letter is shown in bold italics.

Due to the significant amount of work that has been developed for LW32, Tahmoor is proposing to manage this Longwall under the SMP process, as per the rest of this domain. Following Longwall 32 Tahmoor would transition to the Extraction Plan process for the western domain.

Table 1 Tahmoor Colliery Longwall 31-37 SMP Application

Volume 1	Content		Currently being updated and finalised for LW32 SMP
1	Written Report	- Resource Recovery - Characterisation of Surface & Subsurface Features - Subsidence Predictions - Subsidence Impacts - Community Consultation - Statutory Requirements - Economic & Social Impacts & Benefits	
2	Infrastructure Management Plans	- <i>Built Heritage</i> - <i>Built Structures</i> - <i>Council</i> - <i>Endeavour Energy</i> - <i>Environmental</i> - <i>Gas</i> - <i>Main Southern Rail</i> - <i>Potable Water</i> - <i>Sewer</i> - <i>Telecommunications</i>	- <i>Update of the Infrastructure Management Plans required for all Longwall 32</i> - <i>Additional Infrastructure Management Plans to be developed:</i> - o <i>Picton High School</i> - o <i>Picton Water Recycling Plant</i>
3	Infrastructure Assessments	- Subsidence Volume 1 - Subsidence Volume 2 - Aboriginal & European Heritage - Aquatic Ecology Assessment - Floodstudy - Streams Dams & Groundwater - Structural Investigation - Terrestrial Ecology	
4	Plans	- 8 plans as required	

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Update On Matters Raised by the Resources Regulator

The letter from the Resources Regulator raised the following relevant surface features. An update on each of these is provided below.

Picton High School

Tahmoor has been consulting with Picton High School since 2014 during the development of the LW 31-37 SMP Application and further as part of the Modification. Tahmoor is currently finalising the draft *Longwall 32 Picton High School Property Subsidence Management Plan* to provide detailed information about how risks associated with mining adjacent to Picton High School will be managed by Tahmoor. The draft Management Plan will be reviewed and updated in agreement with the Department of Education prior to the influence of Longwall 32.

Picton High School has agreed to provide access for high frequency monitoring before, during and after the mining of Longwall 32. As noted above, Tahmoor is currently preparing the *Longwall 32 Picton High School Property Subsidence Management Plan* in consultation with Department of Education.

A structural assessment has been completed by John Matheson (Structural Engineer) which considers the sensitivity analysis. The assessment analyses the sensitivity of each of the school buildings for their susceptibility to subsidence. This includes susceptibility for higher than predicted subsidence for each structure. The recommendations from the structural assessment are now being included in the management plan and these will be implemented by Tahmoor during the extraction process. This includes a Trigger Action Response Plan (TARP) for management actions in response to the monitoring program.

The assessment of the location of survey marks at the School has been drafted and a site inspection arranged during April 2018 to determine the final location. The survey marks will be installed with baseline surveys complete by August 2018, prior to the influence of subsidence.

Dwellings and Other Associated Built Structures

At the time of preparing the LW31-37 SMP Application all structures within the Application area were identified. A *Built Structures Management Plan* was developed to provide detailed information about how the risks associated with mining beneath these structures will be managed by Tahmoor. The main objectives being the establishment of procedures to measure, control, mitigate and repair potential impacts that might occur to structures during mining.

Tahmoor is currently updating the *Longwall 32 Built Structures Management Plan*, this includes a Structural Engineer completing pre-mining front of house inspections and a Geotechnical Engineer completing pre-mining geotechnical inspections of steep slopes. Tahmoor consults with all residents within the active subsidence zone of Longwall 32, recommending they arrange a pre-mining inspection with Subsidence Advisory NSW. The pre-mining inspection report is assessed by a Structural Engineer to determine if any pre-mining mitigation work is required.

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The Management Plan outlines a Structures Management Group (SMG) that is part of the Structures Management Plan TARP. The SMP is responsible for taking the necessary actions required to manage the risks that are identified from monitoring of structures. The SMG's key members are:

- Tahmoor Colliery (Belinda Clayton)
- Structural Engineer (John Matheson and Associates (JMA); John Matheson)
- Subsidence Engineer (Mine Subsidence Engineering Consulting (MSEC); Daryl Kay)
- Geotechnical Engineer (GHD; Andrew Levantahl)
- Subsidence Advisory NSW

If during mining an impact is reported as outlined in the Structures Management Plan TARP, the SMG convenes to determine the inspection and monitoring frequency. There is an SMG for all infrastructure items including Picton High School.

Public Utilities Associated with the Above Mentioned Built Features

Tahmoor is currently consulting with infrastructure operators including Jemena Gas, Endeavour Energy, Sydney Water Sewer, Sydney Water Potable, Wollondilly Shire Council, Telstra, Picton Water Recycling Plan and Picton High School, as part of the finalisation of the *Longwall 32 Infrastructure Management Plans*. These will be finalised and signed by the Infrastructure Operators for June 2018.

The objectives of the Infrastructure Management Plans are to establish procedures to measure, control, mitigate and repair potential impacts that might occur to infrastructure items and ensure the safe serviceable operation. This objective is achieved by:

- Predicting subsidence movements from Longwalls 32,
- Subsidence predictions and impact assessments,
- Risk assessments,
- Identification of mitigation measures if required prior to Longwall 32 influence,
- Installation of survey marks and monitor before, during and after mining,
- Pre-mining inspections,
- Develop risk control procedures for each infrastructure item in consultation with infrastructure operator; and
- Extensive consultation with the above infrastructure operators throughout the mining process.

Buried Creeks

Tahmoor Colliery has mined beneath and adjacent to many residential structures that are located within minor drainage lines that are similar to the buried creeks. In all cases Tahmoor has ensured these residential structures have remained safe and serviceable, by consulting with the property owner, surveying the property and completing visual inspections during active mining. Tahmoor is currently updating the *Built Structures Management Plan for Longwall 32* properties that are considered potential for valley closure effects on the structures located within drainage lines.

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A flowchart for the subsidence impact management process is developed prior to each structure potentially experiencing impacts. This is undertaken in consultation with the infrastructure owner and/or operators so that the same process (as outlined below) will be implemented for the mining of Longwall 32 for Built Structures, Picton High School and all infrastructure items:

1. Site specific investigations where necessary and appropriate,
2. Implementation of mitigation measures following inspections by Structural Engineers and / or Geotechnical Engineers,
3. Surveys and inspections during mining within the active subsidence zone; and
4. Regular consultation, cooperation and coordination with the stakeholders before, during and after mining.

A Geotechnical Engineer is engaged if the property is located on a steep slope to determine appropriate mitigation and frequency of monitoring and inspections during mining if required. The Geotechnical Engineer may also recommend that the property is inspected by a Structural Engineer prior to the influence of mining.

Higher than Predicted Subsidence

Tahmoor has been safely managing infrastructure items, in consultation with infrastructure operators, during the extraction of Longwalls 22 to 31. There has been no major disruptions to the safety and serviceability of infrastructure items, and no impacts to the health and safety of people due to higher than predicted subsidence.

The management of the potential for higher than predicted movements for all areas effected by Longwall extraction will be risk assessed in mid March. This will be undertaken with infrastructure operators. From this risk control procedures will be included in the updated *Built Structures Management Plan*, the *Picton High School Management Plan* and *Infrastructure (Public Utilities) Management Plans* accordingly. A TARP has been developed as part of the *Built Structures Management Plan* and is currently being reviewed and updated based on engineering assessments and consultation with infrastructure operators and landowners. Immediate responses, if triggered by monitoring results, may include:

- Increase in survey and inspection frequencies by the SMG, where required,
- Additional surveys and inspections, such as regular recording of widths of any new cracks that might appear,
- Repair of impacts that create a serious public safety hazard,
- Repair of impacts to all entry and exit doors, and all other doors that must remain operational for security and fire egress reasons. Even if further impacts are anticipated,
- Repair of impacts that impair any essential services,
- Repair of impacts that impair access and mobility to the property, even if further impacts are anticipated; and
- Repair of impacts to the aesthetic appearance of the property, as required to maintain business reputation, even if further impacts are anticipated.

Nepean Fault and Geological Complexities

A detailed study is currently being prepared on the Nepean Fault. A geotechnical engineer from Strata Control Technology (SCT) has inspected the geological structure and terrain in the immediate area

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around the mine plan where it outcrops at the surface. This is being done to further define the nature of the Nepean Fault. The final mapping will be complete by the week of the 12th of March 2018.

Additionally Tahmoor Colliery together with SCT are further investigating the potential impact of the Nepean Fault on Longwall 32 subsidence and the assessment includes:

- The potential for significant subsidence to occur outside the longwall panels or to produce significant far field subsidence impacts, due to the Nepean Fault.
- The potential for the strata adjacent to the fault to be geotechnically altered, and any associated potential for increasing the subsidence in this area.

The work program for this assessment in the area of Longwall 32 includes:

- A review of subsidence survey data including:

Longwalls 23 to 31,

- Across the Nepean Fault; and
- Property reporting impact from subsidence outside of the goafed areas.
- An investigation into the existence of any potential effects of any geological complexities within the subject area.
- Characterise the geotechnical nature of the overburden strata in the area of Longwall 32, including:
 - Rock properties,
 - Groundwater table and hydrological impacts ,
 - Investigate the potential for abnormal subsidence adjacent the fault; and
 - Investigate the potential for far field effects in relation to the Nepean Fault.

The findings from the study will be reviewed by Mine Subsidence Engineers, John Matheson and included as input into the development of strategies in the Management Plan for Built Structures, Picton High School and the infrastructure (public utilities) management plans (gas, telecommunications, electricity, sewer, potable water, Council).

Tahmoor Colliery have been successfully implementing these processes throughout the mining of Longwalls 22 to 31 and will continue to develop and implement these measures during the mining of Longwall 32.

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Consultation with infrastructure operators, landowners and key Government Agencies commenced during the development of the LW31-37 SMP Application . Tahmoor Colliery is committed to ongoing consultation as part of the finalisation of the SMP process for Longwall 32.

Please don't hesitate to contact me if you have any questions.

Yours Faithfully,



Belinda Clayton
Approvals and Community Coordinator
Tahmoor Underground Glencore

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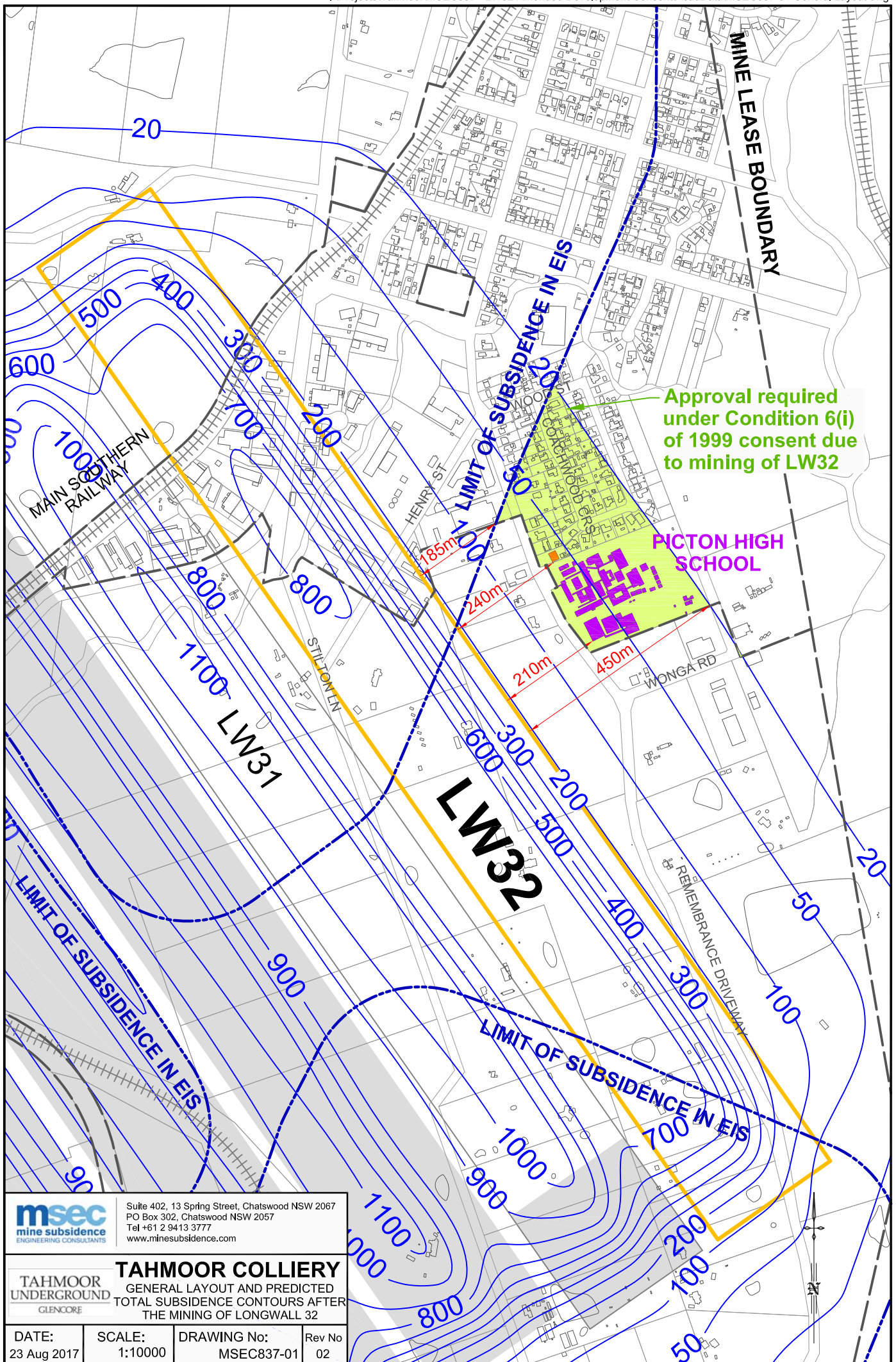
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Enc. **Figure 1. Tahmoor Colliery Mine Plan**
 MSEC837-01 Predicted total subsidence contours after the mining of Longwall 32
 MSEC837-02 Detailed Map
 MSEC837-03 Surface Infrastructure

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Figure 1 Tahmoor Colliery Mine Plan



msec
mine subsidence
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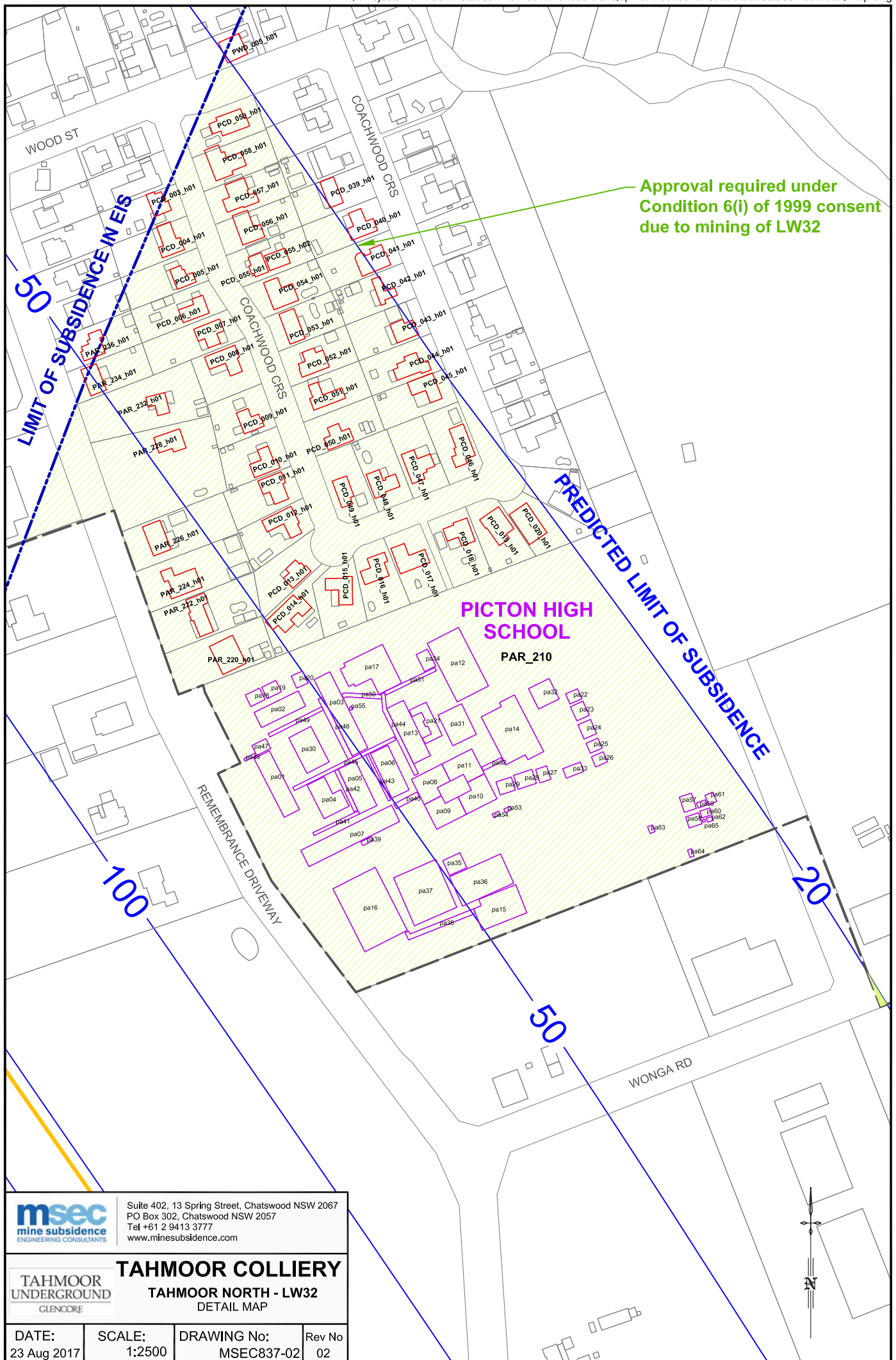
TAHMOOR COLLIERY
GENERAL LAYOUT AND PREDICTED
TOTAL SUBSIDENCE CONTOURS AFTER
THE MINING OF LONGWALL 32

DATE:
23 Aug 2017

SCALE:
1:10000

DRAWING No:
MSEC837-01

Rev No
02



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TAHMOOR COLLIERY
TAHMOOR NORTH - LW32
DETAIL MAP

DATE:
23 Aug 2017

SCALE:
1:2500

DRAWING No:
MSEC837-02

Rev No
02

