

Letter of Objection – Tahmoor South Coal Project SSD8845

Lack of Inclusion and Inadequate reports pertaining to Environmental Impacts and Public Interest

Attn: Commissioners Professor Richard Mackay AM and Professor Chris Fell AO

Date: 24th February 2021

Dear Commissioners,

I wish to submit my objection to the Tahmoor South Project SSD8445 and seek to have my objections considered closely for the benefit of the wider community.

I have lived in this community for more than 50 years and have interacted with these waterways and the local environmental amenity since the age of 7.

My objections relate to the Environmental Planning and Assessment Act (EP&A Act 1979), regarding exclusions “of matters necessary for planning consideration Section 4.15 (b) Environmental impacts to both built and natural environs and (e) – Public Interest”.

Additionally, SIMEC provide at Tahmoor South EIS Section 1.6.3 (p1-19) – that “*Environmental Assessment Requirements in the EIS is prepared in accordance with Part 4 - EP&A Act and the “Act” ensures potential environmental impacts are accurately assessed and considered in the decision-making process”.*

And in relation to the Secretary’s Environmental Assessment Requirements (SEARs), SIMEC’s Environmental Impact Statement (EIS) “**must** comply with the requirements of Clause 6 & 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. In particular, the EIS must include:

- *an assessment of the likely impacts of the development on the environment*
- *a description of the measures that would be implemented to avoid, mitigate and/or offset the likely impacts of the development and an assessment of whether these measures are consistent of industry best practice.*

I provide argument and evidence supporting my objections for multiple distinct areas being:

- Water Pollution - Recreational Waters – public swimming reserves – not adequately assessed & inadequate regulation
- Excessive Non-Conventional Movements (NCM) – at/about known, undisclosed geological faults intersecting the new mine area
- Significant historical Bore and Aquifer Impacts – complete studies not undertaken to historical damages and impacts to long-term bore users (i.e., not disclosed for public scrutiny)

I am of the view that the full extent of environmental and social impacts of the Tahmoor South Project proposal have not been fully disclosed or adequately assessed for the purpose of decision-making as required under EP&A Act 1979 – Section 4.15.

Water Pollution – Recreational Waters

1. Insufficient or incomplete studies have been undertaken in the EIS process – particularly on the social impacts and impacts to human welfare surrounding the popular recreational waters below the mine wastewater discharge point.

Potholes Reserve was officially established in August 1921 by the Tahmoor Progress Association and has high public appeal. Both the Potholes and Mermaids Pool swimming holes continue to be well-visited recreational areas.

Mine wastewater discharge, both treated via Licenced Discharge Point 1 (LDP1) and untreated via sediment dams at Licenced Overflow Points (LOPs), is permitted into Tea Tree Hollow and Bargo River. This has been the case for more than 40 years.

Despite recent studies undertaken to assess mine discharge impacts on aquatic environs at (only) Bargo River and ANZECC & ARMCANZ 2000 guidelines applied to the Tahmoor Colliery Environment Protection Licence (EPL) 1389, these guidelines are not applicable to the protection of humans in recreational waters.

The National Health and Medical Research Committee (NHMRC) is the governing body responsible for managing guidelines for both drinking water and recreational waters in Australia. Both these guidelines are neither applied to the Tahmoor Colliery EPA licence limits or the EIS studies necessary to evaluate recreational water impacts from the Tahmoor South Project. Specific guidelines governing recreational waters are provided by the Australian Government and are identified as NHMRC 2008 – [*Guidelines to Managing Risks in Recreational Water*](#).

2. The variation relative to contaminated water exposure for primary contact (i.e. swimming) between ANZECC 2000 and NHMRC 2008 guidelines are considerable. ANZECC use a default guideline of two (2) litre exposure for persons in primary contact waters, whereas NHMRC-2008 guideline utilises a reference value of 100-200ml of water exposure for persons in primary contact.
3. SIMEC have been advised by their own water expert Hydro Engineering & Consulting on page 51 of the Amendment Report [*Appendix D: Surface Water Baseline Assessment, Water Management System and Site Water Balance, Flood Study, Surface Water Impact Assessment*](#) that the *Guidelines for Managing Risks in Recreational Water (NHMRC, 2008)* should be applied for the purpose of evaluation regarding mine discharge waters having human impact at recreational waters.
4. The [*Department's draft consent conditions*](#) for the Tahmoor South Coal Project proposal allow for mine wastewater discharges to occur at LOPs as permitted under the Tahmoor North operations – where LOPs have no restrictions for chemical concentrations.

The Independent Expert Scientific Committee (IESC) states in [*Advice to decision maker on Tahmoor South coal mining project*](#) that “*untreated water should not be released or allowed to overflow to Tea Tree Hollow or the Bargo River.*”

5. There is no study provided in the EIS to assess the degree of bioaccumulation or sediment accumulation impacts of long-term mine wastewater discharge having excess levels of metal and chemical contaminants at either Tea Tree Hollow or Bargo River, nor at any recreational reserve at either Potholes or Mermaids Pool.
6. There is no reference in any EIS reports identifying the specific type of arsenic proven in mine wastewater discharge. It is important to distinguish the two types of arsenic, known as arsenic (iii) and arsenic (v) because each have a different ANZECC aquatic guideline limit.

The new EPA limits proposed for the Tahmoor South Project apply only to arsenic type (iii) which has a higher aquatic guideline limit of 24µg/L compared to arsenic (v) at 13µg/L. Arsenic (v) is not included in the EPA limitations and yet is identified as being a more toxic/threatening chemical.

Environmental studies have proven the existence of both arsenic types within the Tahmoor Mine discharge wastewaters and DPIE and Wollondilly Shire Council have been advised (by independent aquatic expert) of the need for tighter EPA environmental pollution licence limits (EPL1389).

7. The proposed turbidity (NTU) and Total Suspended Solid (TSS) limits for Tahmoor South are the same limits as applied to Tahmoor North and the original Tahmoor Central operations. Turbidity and TSS limits were established and applied to Licenced Discharge Point 1 (LDP1) until 7th March 2002 (EPA notice 1009086 – Licence Variation).

These limits have been established for over 20 years and are not updated in the DPIE [Draft Consent Conditions](#) or the EPA updates to SIMEC's Environmental Protection Licence (EPL1389), even though a supposed state-of-the-art wastewater treatment plant (WWTP) is to be constructed.

It is more than reasonable to expect that filtering capacity to remove suspended sediments (turbidity and TSS) has improved over the past twenty years, and that limits imposed in EPL1389 prior to any water treatment plant being constructed (or proposed to be constructed) at Tahmoor Colliery should be considered inadequate.

8. Although a new sewage treatment plant is proposed for Tahmoor South, the DPIE consent conditions does not include a condition where treated sewage effluent cannot be dispersed into any surface or recycled mine waters in the sediment dams which has the potential to discharge into public waters via LOPs.
9. The threat of undisclosed or unmonitored discharge from sediment ponds via LOPs, which have historic records demonstrating significant exceedances of damaging pathogens and elevate chemical concentrations (please refer to Tables 22 and 23 of Hydro Engineering and Consulting's [Tahmoor South Amended Project Surface Water Baseline Assessment](#)) remain unrestricted at discharge points and flow directly to Tea Tree Hollow then to Bargo River. This aspect of flow potential of untreated waters to Tea Tree Hollow and Bargo River is directly opposed to IESC advice (2019) and subsequently disclosed to DPIE in 2019.

10. There is an expectation that the new state-of-the-art WWTP should utilise optimal and advanced technology. Live data tracking of some of those licenced pollutant elements and flow parameters should be instantaneously monitored (including Turbidity, Electrical Conductivity, pH, Total Dissolved Solids etc).

Such chemical element and flow monitoring ought to be integrated automatically with site SCADA (Supervisory Control and Data Acquisition) systems and thereafter interfaced with a public warning system to advise of mine wastewater discharge exceedances at waters running via Crown Land, environmentally sensitive zones, and high value wildlife corridors.

Such an undertaking would enable the provision of an interactive automatic public warning system like that provided at Beach Watch facilities at various metropolitan beaches. This automatic public warning system is specifically desirable at popular public swimming reserves Potholes and Mermaids Pool. There is an obvious lack of regulated requirement by DPIE, Wollondilly Shire Council, or the EPA to have an interfaced public warning system for the benefit of human welfare.

11. There is currently a lack of adequacy in local Council warning signs about Potholes or Mermaids Pool reserves.

Public safety falls in the jurisdiction of the local Council, but they are not able to instruct or regulate Tahmoor Colliery on how to manage wastewater disposal, nor can Council provide more appropriate protections at receiving public waters.

There is no signage about the length of Tea Tree Hollow – a creek that is readily accessed via a well-recognised and well-travelled bushwalk from Bargo River Reserve to Mermaids Pool - and beyond. It would seem necessary considering IESC's advise that no untreated waters should be discharged to natural waters and yet that frequently happens during times of higher rainfall. These matters ought to be disclosed and assessed as matters deserving consideration under EP&A Act Section 4.15 - (e) public interest.

12. I have records of vehicle attendance at Potholes/Mermaids Pool parking areas, please refer to **Attachments A and A(i)**. A selection of 29 random days over nearly a twelve-month period sought to demonstrate the degree of popularity about these public reserves.

476 vehicles were recorded attending the Bargo River recreational reserves (Potholes and Mermaids Pool) during the sample dates.

Assuming each vehicle carries an average of 1.5 persons, the total number of assumed attendees at these facilities totals 714 visitors over 29 days.

It can be assumed that many of these visitors do not live in the local area, as locals are inclined to avoid the contaminated swimming holes/waters. Residents and visitors alike are entitled to understand exactly what these swimming locations and swimming holes are exposed to and what the swimming holes contain.

Furthermore, the public visiting a river-side beach area (such as the Potholes) are surely entitled to a similar warning system as applies at various Beach Watch locations. One would

suspect these undertakings to be considered as best-practice integration to a new WWTP and applicable to the benefit of human and social welfare.

13. High turbidity is a concern, such that it drastically impacts natural waters over extended periods and extended months. Please refer to **Attachment B** for photographic evidence.
14. A review of the EPA Annual Reviews for Tahmoor Colliery (EPL1389) listed from 1st May 2000 to 1st Jan 2018 show environmental non-compliance to EPA licence limits occurred on 496 occasions – including excesses of both turbidity and TSS.

Excess TSS was also proven in an independent laboratory analysis conducted by ENVIROLAB on samples taken 8th March 2020, which was an exceedance not declared to EPA under the self-reporting regime. Please refer to **Attachment C** for the findings.

15. Excessive turbidity is an issue requiring close consideration under the NHMRC–2008 [*Guidelines for Managing Risks in Recreational Water*](#) as it invariably does not apply so much to ANZECC and/or Aquatic Ecology.

SIMEC’s current Mine Operations Plan (MOP-2019) indicates non-compliance to environmental impacts and consequence of EPA (regulatory) fines are considered a “*minor consequence*” – of limited concern. See [*Consequence Tables*](#).

Fines for regulatory/licence exceedance is clearly an insufficient deterrent and provide little to no protection to the exposed human in the recreational waters.

17. Without live data and continuous monitoring of licence limits the EPA cannot prove a pollution event, for example turbidity or TSS exceedance, has or has not occurred. This is because the EPA relies on SIMEC self-monitoring and self-reporting.

How can this ever be considered best practice, 40 years after the Colliery started to operate? And how can the community’s expectation of best practice be achieved in Tahmoor South?

18. TSS can only be evaluated in a laboratory environment and is not able to be instantly measured in the field. However, turbidity (NTU) pH, EC, TDS are all elements which can be tracked live. Therefore this information can be and should be integrated with a SCADA system which has a live monitoring telemetry warning system to warn swimmers of potential or increased risk.

19. Access to SCADA Historian and event logging is via password entry, and therefore any external persons interacting and modifying/acknowledging process alarm status can be identified and actions investigated relative to time-stamping.

Automated alarm and warning systems have been established as best practice in water industries for decades, and ought to be incorporated into the respective WWTP control systems – certainly where the discharge relates to public interest, safety, and/or welfare.

The public are generally not sufficiently informed or equipped to make an informed decision about what constitutes safe waters, particularly children.

20. And in terms of monitoring the impacts of prolonged discharge from Tahmoor Colliery within the Bargo River, how is it possible that an official EPA study location (SW13) used to establish the extent of upstream natural waters, can be established below the areas of the river where known subsidence damage has impacted the upstream water course (at LW14-LW19)?

And those waters demonstrate an elevation of liberated minerals and altered natural water composition?

How is it possible that such a contaminated site, known to SIMEC and possibly the EPA to be impacted by previous mining activities, can be used as an official gauging station to compare/validate the impacts of mine wastewater discharges at downstream locations?

Please refer to EPA Pollution Reduction Programs. Please refer to Figure 4 in Hydro Engineering and Consulting's [Tahmoor South Amended Project Surface Water Baseline Assessment](#).

21. There is simply a lack of adequate and appropriate recreational water studies in the EIS and there are insufficient controls imposed on the new Tahmoor South proposal in the DA conditions of consent to provide public confidence about the safety of recreational waters. **Attachments A and A(i)** provide a snippet of the activity and popularity of Mermaids Pool and Potholes Reserve.

22. There is no protection provided to Tea Tree Hollow and the ongoing and historical mine wastewater discharge has had a dramatic impact on the riparian and aquatic environment. Tea Tree Hollow is zoned E2 by Wollondilly Shire Council representing *Environmental Conservation Area*.

Independent analysis of soil/sediment samples taken from within and adjoining to Tea Tree Hollow proves a pollution incident. Please refer to **Attachments D and E**.

23. Wollondilly Shire Council has jurisdiction at the terrestrial regions about the Bargo River E2 Zones as detailed in recent signage at tracks bordering the Bargo River Wildlife Corridor.

Signs, as seen in **Attachment F**, do not detail the risks of exposure to mine waste at popular swimming locations other than to *Enter at Your Own Risk*.

Wollondilly Shire Council's priority agenda is public welfare, and they ought to be permitted to advise using up-to-date technology and appropriate language to describe the specific risks that people can readily interpret and understand.

24. Conclusion: Excessive turbidity is evident in the Bargo River and proven to occur on a frequent basis over extended periods.

Excess turbidity is recognised as a risk in NHMRC 2008 [Guidelines for Managing Risks in Recreational Waters](#). The prospect of the Tahmoor South Coal Project dumping up to another 6ML per day (2190ML/Annum – equivalent to 876 Olympic sized swimming pools)

of turbid and contaminated mine wastewater, running through pristine E2 Zoned conservation lands which is earmarked for a National Park, is simply untenable.

It is concerning that the future discharge will have the same EPA licence limits imposed onto it as Tahmoor North at a time when it did not have a wastewater treatment plant (2002).

The aspect of continued contamination to areas dedicated to public recreation must be assessed within the EIS reports to meet the necessary requirements of EP&A Act Section 4.15 (e) Public Interest.

Dr Ian Wright (Freshwater Ecologist) has determined that median flow at Potholes Swimming Reserve is made up of 67% of mine wastewater discharge compared to natural river flow.

At times of drought and low natural flow, the relative percentage of exposure to mine wastewaters increases considerably. Issues that were not studied in EIS reports include:

- Bioaccumulation impacts – flora and fauna (historical)
- Sediment Impacts – Tea tree Hollow or the Bargo River (historical)
- Accumulation of additional toxic metals/elements within the receiving environment that are not described within the EPL1389
- Impacts to humans via NHMRC 2008 at recreational waters which were established 100 years ago (Aug 1921)
- Disclosure of disposal of extracted waste chemical concentrates
- Disposal of treated effluent discharge from the newly proposed sewerage treatment plant – where to and by what means?
- The aspect of the more dangerous Arsenic (v), which has a lower ANZECC trigger value of 13µg/L rather than the EPA allowance/proposal of 24µg/L for Arsenic (iii)

Excessive Non-Conventional Movements (NCM)

25. The Independent Scientific Expert Committee (IESC)'s [*Advice to decision maker on Tahmoor South coal mining project*](#) noted in point 24 that *“of greatest concern are the potential risks from regional groundwater drawdown and mining-induced ground movements (NCM) that could occur along geological structures beyond the subsidence zone”*.

Further, point 25 notes that *“the potential role of the Nepean Fault and other geological structures in influencing unconventional subsidence and ground movement (NCM) is acknowledged but not assessed”*.

Additionally, in point 25(b), the IESC identifies both the fault name (T2) and specific location, provide its direction towards Thirlmere Lakes, and advise this fault *“may also increase the probability of unconventional mining-induced ground movements (NCM)”*. This existing impact threat at a major undisclosed fault within SIMEC's Tahmoor South Project has not been quantified, completely assessed, or declared and disclosed within their EIS.

This specific non-declaration is contrary to the EP&A Act 1979 Section 4.15 –(b) environmental impact and (e) Public Interest.

Please note, there appears to be some confusion within the EIS and IESC documentation about the correct reference name for this major fault (either T1 or T2). However, there is no doubt about the location of this major fault being detailed and therefore proven within mine plan extraction maps – see Bargo River monitoring location BR2 in Drawing 1 and Drawing 2 in [Xstrata Coal – Tahmoor Colliery: End of Longwall 25 streams, dams and groundwater monitoring report](#) by GeoTerra (2011).

- 26.** The location of the major fault line at LW16 has a surface expression and also had a recent cliff collapse directly above/adjacent to it.

Details of that cliff collapse were shared with the Manager of the Lands Division (Crown Lands), Department of Planning by telephone in Sept 2019. At that time, he advised us that he was unaware of the second cliff collapse.

These details were subsequently disclosed to DPIE and other various NSW Government Ministers (Planning, Energy and Environment, Better Regulation and Innovation) via email and letter dated 1st April 2020.

This email and letter is included in this submission as **Attachment G**.

Prior to my disclosure to DPIE there were no inclusions in any EIS document for Tahmoor South Project referring to any cliff collapse or rock falls at the historical extraction areas within or below the Bargo River Gorge on LW14 - 19.

Additionally, an older cliff collapse on or near LW19, which is adjacent to the central fault at Hornes Creek and Bargo River, was also excluded from EIS reports. Please refer to **Attachment H** and **Attachment I** for photographic evidence of the cliff collapses.

Attachment J is additional evidence of undisclosed cliff collapse at LW16 and LW19. This particular cliff collapse blocked critical fire trail access.

- 27.** Tahmoor Coal, the DPIE, Mine Subsidence experts, Wollondilly Shire Council and various local action groups are all aware of the negative subsidence impacts that have been impressed upon the Bargo River and Bargo Gorge at/between the same locations of LWs 14-19. Tahmoor Coal detailed the impacts of longwall mining at this same location within Bargo Gorge at the [2006 Coal Operators Conference](#).

SIMEC and DPIE are aware of the fault's existence and location, but the lack of assessment is concerning. The fault is required to be studied/assessed/declared and included for assessment for all potential issues that concern the Tahmoor South EIS reporting as matters necessary for planning consideration Section 4.15 (b) Environmental impacts to both built and natural environs and (e) – Public Interest.

- 28.** Another substantial social and environmental concern related to the Tahmoor South Coal Project proposal is that faults may impact groundwater drawdown at or near Thirlmere Lakes.

Professors Philip and Steven Pell drew first light to this probable threat in their [Report on the Water Levels of Thirlmere Lakes](#) (October 2011) and the IESC have identified the same potential risk in their Advice to Tahmoor South Project 2019 - Point 25 (b) *“the location of the geological structure T2 (possibly incorrectly named), close to the proposed project area (it now directly abuts the Tahmoor South mine plan first workings as provided in the revised Amendment Report August 2020) and extending towards Thirlmere Lakes, may also increase the probability of unconventional mining-induced ground movements and associated impacts to groundwater.*

29. Excessive upsidence has also impacted this same area of Bargo River between LW14-19 and provided a physical re-appearance during the long drought up to 2020, prior to and during the December 2019 to January 2020 major bushfire event across the southern portion of the Wollondilly Shire.

Water within Bargo River was witnessed to flow downstream at areas about Kiah Ridge and Bargo River Reserve, however that same surface flow disappeared entirely at an extended location between LW14-19.

River waters were witnessed to flow also at the areas upstream from LW19 to the base of the Picton Weir, where a small disused and partially open valve enables water to drain from the containment above Picton Weir.

“Self-healing” at the upsidence impact zone has not occurred, and surface water drawdown continues today. The effects and impacts of continuing surface water drawdown at this location would need to be reassessed for the purpose of appropriate assessment and declaration within the Tahmoor South EIS.

Re-emergence of significant Bargo River upsidence and subsequent disappearance of surface water was reported to DPIE - Executive Director of Resource Assessments by email and letter 26th Feb 2020.

Please refer to **Attachment K** for photographic evidence of Bargo River upsidence. Clearly there is little to no evidence of the assumed riverbed fracturing having self-healed.

30. The locations of major faults are shown in HydroSimulations report Appendix C – [Tahmoor South Amended Project Report: Groundwater Assessment](#), Figure 3-9 – Geological Structure. It is noted that although other significant geological structures have been identified external to the mine plan area (example – the Central Fault and Nepean Faults) there is no declaration of the major fault at LW16 extending into and/or across the township of Bargo.

It would be most apparent to determine the extent of the known fault alignments, particularly those with the potential to intersect residential areas. Such a fault needs to be included in seismic studies for the purpose of evaluation and disclosure in the EIS – and therefore is a matter of necessary inclusion under EP&A Act – Section 4.15 – public interest.

31. In terms of threats from faults at or near Thirlmere Lakes and Tahmoor Colliery, the NSW Office of Environment and Heritage provide in their Summer of 2019 Study that the surface

impression of the Central Fault extends from the SE corner of the proposed Tahmoor South mine plan to the near edge of Thirlmere Lakes.

The OEH map provides that fault alignments have been field confirmed. See the Geology map in [Thirlmere Lakes Newsletter Summer 2019](#).

32. SIMEC's own subsidence expert – Mine Subsidence Engineering Consultants (MSEC) provide in the [Appendix B – Subsidence Assessment – Amendment Report](#) – 1.7 – Geological Structures – *“Tahmoor Mine has undertaken comprehensive geological exploration of the overburden (surface mass) and the Illawarra Coal measures (coal seams) within the Subsidence Study Area using several geological and geotechnical consultants (MBGS, 2013; Gordon Geotechniques, 2013; SCT, 2013a) and a number of geological structures have been identified”*.

Further MSEC provide *“additionally, an extensive array of seismic survey lines (140km) was completed over recent years and combined, this data provides sufficient data to have a sound understanding of structural features likely to impact on mining”*.

MSEC go further at Section 4.8 – Non-conventional ground movements (NCM) and they note *“It is likely Non-conventional ground movements will occur and within and around the Subsidence Study Area, due to near surface geological conditions...which were discussed in Section 3.4. These non-conventional movements are often accompanied by elevated tilts, curvatures and strains, which are likely to exceed the conventional predictions”*.

MSEC conclude in section 4.8, *“A number of geological faults and other geological structures have been identified within the Subsidence Study Area and it is possible that non-conventional movements (NCM) could develop along these geological structures”*.

At MSEC Drawing MSEC1123-06, which is included in this submission as **Attachment L**, a major fault at LW16 is drawn as intersecting the new mine plan at Tahmoor South Project Longwall 102A. There is no definition provided to the extent of the identified fault's reach and south east bearing/direction.

33. Hydrosimulations ([Appendix C – Groundwater Assessment](#)) provides from a workshop held between IESC and Southern and Western Coalfield operators in March 2019 – *“the data available on (geological) structures at the EIS phase is limited”*.

Where such comprehensive geological exploration has supposedly been undertaken at those major faults identified in various SIMEC Tahmoor South EIS reports by various experts across a variety of fields and disciplines, the aspect of a major undisclosed fault intersecting a residential area and expansive township must be declared as matters necessary for planning consideration Section 4.15 (b) Environmental impacts to both built and natural environs and (e) – Public Interest.

34. Subsidence Advisory NSW (SA NSW) outlined in a letter to Deep River Developments about a subdivision application at 31-33 Hambridge Road, Bargo that *“Estimated damage to future dwellings would be unable to be effectively mitigated against by engineering design”* and *“The estimated damage would be such that it is likely that future development would not be*

able to be occupied (would be unserviceable) following the impact caused by mining activity.”

It is concerning that non-conventional movement predictions for Tahmoor South Project under existing residences within the Bargo township are so extreme that SA NSW advise no new building constructions can be designed to mitigate the proposed mine subsidence - even though SIMEC provided evidence indicating predicted subsidence across much of the residential area of Bargo lies within the SA NSW construction guidelines 4.

35. It is worth noting that DPIE commissioned a report by the IESC in August 2015 titled [Monitoring and management of subsidence induced by longwall coal mining activity.](#)

This report involved the inclusion of MSEC and Strata Control Technology (SCT). This report advises that *“in the Southern Coalfield, such anomalous movements have been found to occur in approximately one per cent of the observed subsidence movements (MSEC 2004).”*

36. What undeclared anomaly or what damning undisclosed information exists within the Tahmoor South Project mine plan area and or subsidence assessments such that mining at Tahmoor South will cause excessive damage to both built and natural features, in excess of subsidence modelling predictions?

A letter from DPIE, which is included as **Attachment N** of this submission, states:

“In accordance with this Direction, Council consulted the Mine Subsidence Board [now SA NSW]] to confirm if it has any objection to the proposal.

SA NSW has clearly indicated it does not support the proposal until subsidence is complete, as future mining operations are likely to result in a high risk of land subsidence and damage to property.

If the rezoning were to occur there is a high probability that future urban development would not be supported by SA NSW prior to 2030 at the earliest and that the extent of damage cannot fully be predicted.”

37. In **Attachment N**, The Division of Resources and Geosciences (now GSNSW) demonstrated on 18th October 2017, relative to the Tahmoor South SEAR’s requirements for Tahmoor Coal, the intent to extend longwall mining at multiple underground coal seams.

<p>Division of Resources and Geosciences (now GSNSW) 18 October 2017 (Attachment I3)</p>	<ul style="list-style-type: none"> • Division of Resources and Geosciences (DRG) advised that in response to new Secretary Environmental Assessment Requirements (SEARS) for Tahmoor Coal to mine beneath the site, it supports urban development at the site after the completion of longwall mining of underground coal seams. • DRG re-iterated the strategic importance of the Southern Coalfield and the remaining resources within the Tahmoor Mine holdings due to their continued use in steelmaking.
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On 2nd October 2020, GSNSW provided the specified coal seam to be targeted below Bargo township area is the Wongawilli Coal Seam.

- 38.** As mentioned in point 34 of this submission, SA NSW advised that *“it is not possible to mitigate predicted subsidence impacts through practical engineering design.”* SA NSW Director Joe D’Ermilio advised via email on 31st August 2020 that *“The conventional subsidence design parameters have been modified.... However, the non-conventional movements expected as part of the Tahmoor South Project do not support the rezoning of land or approval of any subdivisions”*. Please refer to **Attachment O**.

- 39.** SIMEC attempted to block a subdivision within Bargo that lies completely outside the Tahmoor South Project mine plan footprint. It was recommended that the development on the Tylers Rd site not proceed until 2035 due to *“medium term mining proposals”*.

Because the Tylers Rd proposal is outside the mine plan footprint, it bears little relevance to the proposed Tahmoor South Coal Project. Yet SIMEC wished to block a development on the undisclosed premise of the intention to mine multiple coal seam below Bargo Township. See Section 4.2(ii) of the [Tylers Rd Bargo Planning Proposal](#).

- 40.** There is inconsistent advice. On one hand DPIE and SA NSW inform community/developers that the proposed subsidence from Tahmoor South Project lies within the SA NSW Guideline 4 (construction guidelines to tilt and strain).

However, these agencies also recognise that the threat from non-conventional movements is so extreme that future development or subdivision is not permitted.

Additionally, where the Division of Geosciences considers the potential from multiple coal seam extractions, such inclusion or reference to future extractions proposed beyond the studied coal seam extraction (Bulli Seam) is a matter of necessary consideration for the EP&A Act 1979 – (b) Environmental Impact & (e) Public Interest.

Information pertaining to extraction from multiple coal seams under existing residential areas should have been declared in the EIS documentation. It appears that decisions and advice from regulating bodies are informed by the knowledge of coal extraction from seams not disclosed or examined in any of the EIS reports.

- 41.** Therefore, if anticipated non-conventional movement is so extreme then the assessment needs to be fully evaluated, studied appropriately, disclosed entirely, and identify the cause of such extreme predictions. The Tahmoor South Coal Project prediction for excessive non-conventional movements renders subsidence prediction models redundant for this and any future subsidence evaluation around urban development.

- 42.** There are 266 residential homes still within the proposed mine subsidence impact area – 143 of which lie directly above the Amendment Plan proposed longwall panels.

43. EIS assessments do not include any specific reports about the detailed extent of assumed non-conventional movement (otherwise referred to as Anomalous Ground movement, Non-Systematic Movement etc).
44. The exclusion of geological structures in studies undertaken during the EIS process has the potential to impact Thirlmere Lakes via groundwater drawdown caused by non-conventional movements (NCM).

Section Two of SLR Consulting's [Tahmoor Mine: Groundwater Modelling Plan](#) states that there must be an *"incorporation of any future geological structure mapping and information that is relevant to the transmission of groundwater effects"*.

45. The Independent Expert Scientific Committee stated in [Advice to decision maker on Tahmoor South coal mining project](#) that they have little confidence in the estimates of subsidence and other associated ground movements in these locations: *"Additional geological characterisation, groundwater level analysis and targeted seismic surveys across fault zones may help to understand the hydrological influence of the fault zones."*
46. In the same [document](#), the IESC stated that *"The IESC does not have confidence in the EIS's conclusions that Thirlmere Lakes and the Metropolitan Special Area would not be significantly impacted by mining operations. Of greatest concern are the potential risks from regional groundwater drawdown and mining-induced ground movements that could occur along geological structures beyond the subsidence zone."*

And *"that the potential role of the Nepean Fault and other geological structures in influencing unconventional subsidence and ground movement is acknowledged...but not assessed"*.

47. The IESC also states that *"the location of the geological structure T2 [LW16] close to the proposed project area and extending towards Thirlmere Lakes may also increase the probability of unconventional mining induced ground movements and associated impacts to groundwater"*.

And *"Overall, there is a lack of clarity about the volume of groundwater use by production bores in the region, and also the influence of the geological structure T2 [LW16] and whether or not the structure extends from coal seam to ground surface"*.

48. What is clearly evident, and was never disclosed in the EIS reports, is that significant cliff collapses occurred directly above LW16 at the Bargo River crossing, and further south in the Bargo River Gorge to the approximate location of LW19.

The suggestion is that the geological structures above adjoining longwall panels at the point of abutting the Amendment Report mine plan locations may indeed have surface expressions.

The images of cliff collapses at both of these locations, along with the lack of inclusion in the EIS reports was presented to the Minister Rob Stokes, Minister Kevin Anderson, Minister

Kean, and Mr Mike Young from the Department of Planning, Industry and Environment, via email and letter dated 1st April 2020. Please refer to **Attachment G** for a copy of the letter.

49. I have also written to the Minister Stokes, Minister Kean, Minister Anderson, and Mr Young about SIMEC announcing that aerial magnetic surveys capable of identifying fault locations within the Tahmoor South Project area are available as diagnostic tools. However, these surveys have not been undertaken. There is also no such study provided in the EIS documentation.
50. Conclusion: It should be highlighted that NCM cannot be accurately predicted yet the outcome is the possibility of no future underground mine extraction under or near an existing built community because of the unpredictability. Therefore NCM is a threat to residential sterilisation in all future mine development applications.

Where non-conventional movement is declared as the apparent reason why co-existence between an existing community and a coal mine cannot be maintained or sustained, it renders the purpose of subsidence prediction modelling.

IESC's [*Monitoring and management of subsidence induced by longwall coal mining activity*](#) report outlines that NCM impacts across the Southern Coalfield have been found to occur in approximately one percent of subsidence areas. But apparently in Bargo, an obscure little township within the Southern Coalfield, lies a much greater threat that has failed to be disclosed.

Significant historical Bore and Aquifer Impacts

51. EIS assessments do not include bore water quality studies for the full range of historical bores above Tahmoor mine extraction areas.

Historical degradation of a private bore which does not lie over longwall extraction, but does lie above historical first workings in the central and original mine extraction region, has been demonstrated and presented directly to DPIE. These water quality impacts have been proven to extend beyond 25 years. See Attachment P ENVIROLAB report 250240.

52. Multiple independent laboratory evaluations have been undertaken over the life of the bore regarding its water quality status. The sample bore has degraded in quality, yielding disastrous consequences, including massive iron contamination, dangerous levels of copper, and worrying levels of zinc.

Expert advice provided *“the bore water is unsuitable for contact with any natural waters and all efforts ought to be made to avoid contact with stormwater run-off”*. This degree of mine subsidence induced mineral contamination is ongoing, even after the bore has been redrilled for the purpose of “healing” and the bore continues to demonstrate increasingly severe compromised water quality - 25 years following its original construction. Please refer to **Attachment Q** for bore water quality analysis and **Attachment R** for bore drilling records.

53. The Independent Expert Scientific Committee states in their Groundwater Monitoring - point 38, that the IESC *“considers improvements should be made to the groundwater monitoring*

network” and further provides at point (d) – “The proponent should also seek to include reliable groundwater head data from all public and private bores”.

54. Significant bore and aquifer impacts have not been adequately studied across the full extent of previous workings/mine extraction areas. There is long term evidence of continuing degradation to bore water quality, even to bores which have been attempted to be healed. See page 84 of [Report on the Water Levels of Thirlmere Lakes](#) by Pells Consulting.
55. The DPIE has been made aware of this degradation of water quality issue by correspondence as seen in **Attachment R**. The extent of existing and continuing bore damage over original mine areas at the Tahmoor Central location has not been included in the EIS (LW 1 - 21) and is a matter of necessary consideration for the EP&A Act 1979 – (b) Environmental Impact & (e) Public Interest.
56. The continuing degradation to bore quality over an extended time leads to the assumption that more bore damage is likely to arise.

As the total of compromised bore count increases, it renders the estimation of damaged bores in SIMEC’s Groundwater Assessments as inaccurate. This likely inaccuracy results in a scenario in favour of Tahmoor Colliery regarding predicted ongoing impacts to Thirlmere Lakes. The *Tahmoor Mine Groundwater Modelling Plan* can be accessed [here](#).

57. The aspect of using a deterministic scenario to establish the extent to which bores contribute to the drawdown impacts of the aquifer at/below Thirlmere Lakes presents a skew in favour of mine impacts.

This is because the number of damaged and compromised bores has never been established and for those bores whose yield have been dramatically impaired should not be used in the estimation to determine bore drawdown contribution.

Historical and ongoing bore impacts (both long and short-term degradation) is a matter of necessary consideration for the EP&A Act 1979 – (b) Environmental Impact & (e) Public Interest.

58. It must be noted in Section 3.8.7.2 Analysis of flow differentials of HydroSimulations [Tahmoor South Amended Project Report: Groundwater Assessment](#) states that there is an indication of “leakage from the alluvium and therefore the Thirlmere Lakes and Blue Gum Creek to the Hawkesbury Sandstone” aquifer. The proportion of impact caused to aquifer drawdown by mine subsidence and mine extraction compared to the estimation of impact caused by impacted bores must be clarified and validated.
59. Page 51 of the same [report](#) states that 1.6ML per day of groundwater has been extracted (over the previous 10 years) from the mine via Shaft 3. Shaft 3 drains the area from the west i.e. the mine extractions on the lower side of Thirlmere Lakes and at LW14-19.

Assuming Tahmoor South mines for the proposed thirteen (13) years until 2035, that single water pumping extraction line at Shaft 3 will remove 13,432 ML of groundwater from the west area alone. In terms of volume, that value equates to more than 5,372 Olympic-sized

swimming pools – or almost 20% (19.4%) of the entire holding capacity of Nepean Dam (67GL).

60. Bore extraction seldom extends 24-hours, seven-days-a-week, 365 days a year, though mine groundwater drawdown does continue every second of every day. This comparison/assumption that bore use is equivalent or greater than Tahmoor Mine groundwater drawdown is simply preposterous.
61. HydroSimulations also outline on page 98 of the same [report](#) that *“The model suggests that in the proposed mining footprint (the Central Domain) (Figure 5-2) most of the recovery is complete about 150 years (year 2200) after the proposed cessation of operations at Tahmoor South”*. And at page 98, HydroSimulations states the *“maximum drawdown at the lakes that is due to Tahmoor South is predicted to occur in 2070-2100”*.
62. HydroSimulations also advise at page 122-3 ([Table 7-2](#)) as to the Tahmoor South Effect on Groundwater Quality, that *“Surface cracking above panels will lead to similar effect on shallow groundwater and surface water as observed around Tahmoor North.”*

Regarding groundwater effects at Thirlmere Lakes (High Priority Groundwater Dependent Ecosystems) it is indicated that there is a higher groundwater drawdown because of the Amended Project, to which the deterministic scenario applies.

63. The aquifer gradient within/adjoining the general Tahmoor and Tahmoor South mining lease areas indicates an “aquifer bowl” that extends/dips under Tahmoor and Pheasants Nest areas. The aquifer from below Bargo, Yanderra and Yerrinbool areas (where significant farm enterprises using bore water exist currently), drains from the south to north and west to east directions.

Long term mineral liberalisation resulting from mine subsidence fractures rock mass above mine extractions and invariably impacts various aquifers having a range of depths – is likely to result in a greater mineralisation impact at a range of groundwater bores over an extended time, namely beyond the proposed life of Tahmoor South Project.

Additionally, the yield and quality impacts are likely to appear in areas outside of the proposed mine footprint over an extended period beyond the proposed mine life for Tahmoor South.

64. A Water Access Licence is granted in perpetuity and is a mortgageable property asset.

Provision of “make good” alternate supplies has not provided that potable water or water having potable water quality to be supplied to damage bore owners in the event of future subsidence claims.

It is imperative, that where bore users draw groundwater from what is described by the NSW Government as *“high value high yield aquifer”*, impacted bore users are entitled to receive subsequent supplies that are reflective of that specified high value water quality.

Section 4.2 Hydrogeology of the SLR [Tahmoor Mine: Groundwater Modelling Plan](#) states *“These aquifers fall within the Sydney Basin Nepean Sandstone Groundwater Source and have been classified as being ‘Highly Productive’ by the NSW Government based on considerations of bore yield and groundwater quality.”*

65. The life of the Tahmoor South Project presents an estimation of operational life of 13 years. The aspect of perpetual water licence relates to access extending forever. Water NSW ‘s [definition of licence](#) is *“Also called a water access licence or WAL or water access entitlement, licences give the holder a perpetual entitlement to receive a portion of ongoing water allocations in a specified water source and to take that allocated water in accordance with conditions attached to the licence.”*

66. Wollondilly Shire Council has been involved in a pursuit to draw future farmers to the LGA since approximately 2014. The Semi Peri-Urban Network (SPUN) was established to identify local farm-land area that which lies near Metropolitan Sydney and have ready access to well established transport routes.

The thrust of the SPUN study is to provide alternate farm areas to provide an alternative food bowl to those farmlands impacted by the development of the Western Sydney Aerotropolis.

It is therefore essential, that prospective future farm owners and agricultural entrepreneurs are entitled to know what impacts are proposed/likely to occur to bore yield and bore quality within this mine region (Wollondilly Shire).

They should also be made aware of the historical damages impacting existing bores that demonstrate that bore water quality (influenced by mine-induced subsidence activity) continues to deteriorate over an extend time.

Such information regarding the known impacts to historical bores has not been disclosed in the EIS documentation, neither has a study on long-term bore quality degradation been undertaken for appropriate evaluation and assessment.

67. Additionally, where a project is known to impact aquifers, bores, and those persons reliant upon continual good quality water sources, and considering Council seeks to draw farming entrepreneurs and agricultural businesses to the area, disclosure of the local Council’s regional farming initiatives ought to be made aware for the purpose of public interest.

As presented to DPIE in **Attachment S** of this submission – *“It is inconceivable that such exclusion is tolerated considering the local council has nominated this same area (to be further impacted by Tahmoor South Coal Project) has been promoted as a “future food bowl” to service Sydney Metropolitan market.”*

Wollondilly Shire Council describes itself as *“a recognised industry leader in its proactive approach to the protection of productive peri-urban rural lands and agriculture in the Sydney Basin”* in its [Create Wollondilly: Community Strategic Plan 2033](#).

68. Wollondilly Shire is also identified as the “Lead Proponent” in the proposal to develop the [Sydney Food Futures collaborative research project](#).
69. Future farmers and/or agricultural entrepreneurs, lured under false pretences to an area that supposedly provides access to vast, high-value, high-yield aquifers is a blatant deception and requires close assessment and disclosure for public interest. Wollondilly Shire Council is the lead proponent of the 12 councils represented in the SPUN program.
70. The only evaluation of bore quality within the EIS is taken from an assessment of a select number of bores above the Tahmoor North region, where the number of private bores is dramatically reduced compared to the bore count about the historical mine extraction areas (LW1 to LW21).

The study on bore quality mentioned in Section 5.4 Water Quality of the SLR [Ground Modelling Plan](#) report is for the Tahmoor North region and only extends over a seven (7) year period. It is also established at a point in time when aquifer impacts have already occurred, therefore misrepresenting baseline data

Section 5 Aquifer Monitoring of the same report outlines that several Vibrating Wire Piezometers (VWP) installations have stopped working and that some are providing suspect data.

71. On page 286 of The Independent Thirlmere Lakes Inquiry Committee’s [Final Report](#) it says “*it is not possible to determine the relative contribution of... pumping from groundwater bore sources...*”. Nine years following that expert announcement, a comprehensive study about the historical impacts to and contribution from bores is yet to be undertaken.
72. SIMEC’s own groundwater expert (SLR Consulting) advise groundwater (bore pumping) usage is “Highly Uncertain” regarding the estimation of bore drawdown used in the deterministic scenario to calculate drawdown impacts at Thirlmere Lakes. See SLR - [Groundwater Modelling Plan](#) – Section 7 – Model development – Table 1 on page 22).
73. SIMEC’s other water expert HydroSimulations advises on page 29 in its [Groundwater Assessment](#) that “*The lack of records indicates a high degree of uncertainty with estimating historical groundwater usage for this study*”.
74. HydroSimulations also advise on page iii that predicted drawdown due to local bore pumping is assessed to be in a similar order to Tahmoor Mine cumulative mining impacts – noting that bore “*pumping rates are uncertain*”.
75. It is pertinent to note that point 6 under the heading Groundwater drawdown in the IESC’s [Advice to decision maker on Tahmoor South coal mining project](#) also noted 12 months prior to the revised groundwater modelling being undertaken, that *the “extraction from non-mining bores is unknown.”*
76. Clearly, where a mine is suspected of impacting environmentally significant Ground Dependent Ecosystems that lie within World Heritage Listed National Parks, the drawdown

attributed to bores (that which are significantly impaired due to mine subsidence impacts) needs to be accurately represented and not be permitted for indiscriminate inclusion.

Deceiving information or incomplete information can be used to favour the degree of impact assessment attributed to mine groundwater drawdown.

- 77.** The extent to which existing farm areas (Yanderra, Couridjah/Tahmoor West, Pheasants Nest) are likely to be impacted regarding bore yield (or volume) is demonstrated in HydroSimulations [Groundwater Assessment](#) – Effects at Groundwater Users - Figure 6.1. Water quality impacts are not advised or considered in the EIS nor the areas directly below existing farmlands and agricultural enterprises.
- 78.** In terms of the local geology, there lies between Thirlmere Lakes and beyond the East of Pheasants Nest, an effective bowl which supports the local aquifer. Hence why groundwater bores and existing farms are so prevalent in this area and proven to correlate within the study figures. Refer to HydroSimulations - [Groundwater Assessment](#) – Regional Geological Model – Figure 3-10.
- 79.** The predicted groundwater drawdown volume attributed to Tahmoor South Project, i.e. the estimations displayed in HydroSimulations - Modelled Groundwater (mine) Inflows, demonstrate the predicted inflows from groundwater sources (local aquifers) almost doubles to more than 7ML per day over the estimated existing Tahmoor Mine inflow of approximately 4ML per day.
- At an increase of 3ML per day, that volume of additional groundwater take is equivalent to 1.2 times of an official sized Olympic Swimming Pool (2.5ML) - 438 more swimming pools of volume to be added every year to the existing/perpetual mine inflow.
- In total, 7ML per day of mine inflow drawdown from local aquifers is an equivalent to 1,022 official sized Olympic Swimming pools each and every year. That volume of water take will not cease at the proposed termination/life cycle of Tahmoor South Project. It will be extended for decades or more following mining cessation.
- 80.** As a summary from SIMEC's own EIS, bore usage (drawdown) has been estimated to be equivalent to or greater than mining drawdown of groundwater at and about Thirlmere lakes aquifer – but the data cannot be validated!
- 81.** The summary comments in Section 6.8.1 – Impacts of Tahmoor South Project of the HydroSimulations [Tahmoor South Amended Project Report: Groundwater Assessment](#) that *“there are no anticipated risks of reduced beneficial uses of the Nepean GMA [Groundwater Management Area] porous rock aquifer as a result of the Tahmoor South mine”* is misleading and deceptive.

Excluded or incomplete studies about historical bores and the assessments about bore contribution to drawdown to aquifers relative to impacts affecting Thirlmere Lakes is a matter of necessary consideration for the EP&A Act 1979 – (b) Environmental Impact & (e) Public Interest.

- 82.** Importantly, it is well known to Tahmoor Colliery, SIMEC and the DPIE that assessment for damages or impacts to bore water (and springs) quality and yield are required as part of the EIS process.

This is outlined in SIMEC Development Consent [DA67/98 Modification 4 – Oct 2018](#) in particular, on groundwater bore users in the vicinity of the site. Please refer to point c) Waste Management Plan on page 11 and item 13.i).

- 83.** Impacts predicted to future bores and farmland locations as outlined in Effects of Groundwater Users – Figure 6.1 of the HydroSimulations [Groundwater Assessment](#) ought to be disclosed to the community, existing and future farming and agricultural enterprises, Wollondilly Shire Council and to the study of Semi Peri-Urban Network.

It should be disclosed as a matter of necessary consideration for the EP&A Act 1979 – (b) Environmental Impact & (e) Public Interest.

- 84.** Please refer to **Attachment T**.

- 85.** Section 3.7.3 – Geological Structure of the HydroSimulations [Groundwater Assessment](#) also notes that *“the data available on [geological] structures at the EIS phase is limited”* and that *“mine operators investigate structures in greater detail as mine planning proceeds”*.

This approach counters the disclosure of known faults and their subsequent threats to NCM and groundwater impacts. This approach counters the principles governing disclosure to EP&A Act - matters necessary for planning consideration Section 4.15 (e) – Public Interest.

- 86.** All of the above points are a necessary requirement to be studied and declared as matters necessary for planning consideration Section 4.15 (b) Environmental impacts to both built and natural environs and (e) – Public Interest”.

- 87.** Conclusion: Proven extensive damage has occurred to bores located above the historical extraction areas about the Tahmoor Mine complex.

Water sampling and analysis over a twenty-five (25) year period proves that bore quality degradation extends over a long period and becomes progressively worse in quality as time passes due to exposure to liberalisation of minerals caused by mine subsidence damage to aquifers and the associated strata.

Aspects of severe damage have been proven by Dr Philip Pell and Dr Steven Pell as far back as their studies about Thirlmere Lakes in 2010-2011 were subsequently detailed in Dr Pell’s IPC presentation.

Many other bores, including the Douglass Bore and its near neighbour at Pilmanis/Winter property near the corner of Hawkins Rd and Rockford Rd Tahmoor, are also impacted and the owners are available for comment. Utilising correct and current bore assessment data will result in reductions of bore capacity and usage, leading to a lesser impact derived from the “deterministic scenario” used in the Groundwater Modelling Plan to determine impacts to Thirlmere Lakes in the EIS Amendment Report.

Subsequently, utilising more appropriate and accurate bore data may prove that water drawdown attributed to mining influences may ultimately be proven to be somewhat higher than that predicted in the EIS reports.

SIMEC's own water experts advised about the use of questionable data and the relevance of skewing data in an exercise of such importance in relation to additional mine impacts to World Heritage Listed National Park (Thirlmere Lakes) is an outrage. HydroSimulations advised SIMEC that bore data has a "*high degree of uncertainty*" and SLR Consulting provided that the data used is "*highly uncertain*".

I close that information about correct/accurate assessments to bore and aquifer impacts has either not been disclosed or has been misrepresented in the EIS reports and subsequently are issues requiring disclosure in the EP&A Act for matters of necessary consideration pertaining to section 4.15 – (b) environmental impacts and (e) public interest.

I urge the IPC not to approve the Tahmoor South Project based on insufficient studies, incomplete evaluation and exclusion of necessary details that which pertain to major issues regarding environmental impact and public interest - as per requirements for necessary inclusion of matters pertaining to development assessment relating to the EP&A Act 1979 Section 4.15.

Yours Sincerely,

A handwritten signature in cursive script, appearing to read 'Neil Purnell', is enclosed in a light blue rectangular box.

Neil Purnell

Tahmoor Resident