

Master Trigger Action Response Plan

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Downstream reduction in catchment flow rate in Stonequarry Creek at Picton Gauging Station (GS212053)	<p>RAINFALL</p> <p>Locations</p> <ul style="list-style-type: none"> Bureau of Meteorology (BoM) Station 68052 (Picton Council Depot) WaterNSW stations 568295 (Lakesland Road), 568296 (Thurns Road) and 212063 (Lake Nerrigorang at Thirlmere Lakes) Additional automatic rainfall stations to be installed (including Stonequarry Creek catchment, Picton to Mittagong rail corridor and additional locations depending on land owner access agreements) <p>Frequency</p> <p><u>Pre-mining</u> – Data recorded daily and downloaded monthly (other than Stonequarry Creek catchment station).</p> <p><u>During mining</u> - Data recorded daily and downloaded monthly and used in analysis as outlined in the methodology for streamflow below.</p> <p><u>Post mining</u> - Data recorded daily and downloaded monthly for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p> <p>STREAMFLOW</p> <p>Locations</p> <p><u>Impact Assessment site</u> – WaterNSW gauging station GS212053 (Stonequarry Creek at Picton)</p> <p><u>Control sites</u> - Bargo River (Site 300061) and Hornes Creek (Site 300062)[†]. Locations illustrated in Figure 5-3 of the Water Management Plan.</p> <p>Frequency</p> <p><u>Pre-mining</u> – Continuous record, data downloaded at start of mining; data from the end of mining of LW25 (21/2/2011) has been used to calibrate a pre-mining streamflow model. The period from 21/2/2011 to the commencement of secondary extraction from LW W1 is the baseline data period.</p> <p><u>During mining</u> - Continuous record, data downloaded monthly and analysed six monthly to compare monitored to model predicted flows as follows:</p> <ol style="list-style-type: none"> Monitored flows will be filtered in order to assess only low flows (flows > 0.24 ML/d [mean flow] will be set to modelled flows); Filtered monitored flows will be summed to give 14 day totals for comparison with corresponding 14 day totals of predicted flow from the catchment model. 	Level 1		
			<ul style="list-style-type: none"> The median of the ratios does not fall below the 40th percentile* of the baseline data at GS212053 (refer to Table 1 for baseline ratios). 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Six monthly review and assessment of data. 	<ul style="list-style-type: none"> No response required.
			Level 2		
			<ul style="list-style-type: none"> The median of the ratios falls below the 40th percentile but does not fall below the 20th percentile* of the baseline data at GS212053 (refer to Table 1 for baseline ratios). 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Six monthly review and assessment of data. Convene Tahmoor Coal Environmental Response Group to review possible cause and response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group.
Level 3					
<ul style="list-style-type: none"> The median of the ratios falls below the 20th percentile* of the baseline data at GS212053 (refer to Table 1 for baseline ratios). <p>AND</p> <ul style="list-style-type: none"> A similar trend has occurred at the control sites[†]. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Six monthly review and assessment of data. Convene Tahmoor Coal Environmental Response Group to review possible cause and response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group. Consider increasing review of data to monthly. Undertake the analysis of monitored flow rate versus modelled flow in control catchments[†]. Filtered monitored flows at the control sites will be summed to give 14 day totals for comparison with corresponding 14 day totals of predicted flow from catchment models for these sites (calibrated for the baseline data period). 			
Level 4					
<ul style="list-style-type: none"> The median of the ratios falls below the 20th percentile* of the baseline data at GS212053 (refer to Table 1 for baseline ratios). <p>AND</p> <ul style="list-style-type: none"> A similar trend has not occurred at the control sites[†]. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Increase review and assessment of data to monthly. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess if the change in behaviour is related to LW W1-W2 mining effects, other catchment changes or the prevailing climate. 	<ul style="list-style-type: none"> Continue monitoring and monthly assessment (until assessment indicates that the trigger is no longer occurring or it can be established whether the effect is mining related). Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). If it is concluded that there has been a mining-related impact then implement a corrective management action plan in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP). 			

		<p>The ratio of filtered, monitored flows divided by the modelled flows will be calculated at 14 day intervals commencing at the beginning of the baseline data period and advancing to the end of the assessment period. The median of the ratios will be analysed over a sliding window of 1 year.</p> <p><u>Post mining</u> - Continuous record, data downloaded monthly for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>			
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Footnotes:

* The 40th and 20th percentiles of the baseline data have been adopted for each trigger level. The 20th percentile is an accepted metric of a significant variation from 'normal' conditions while the 40th percentile represents a slight deviation from the median or 'normal' conditions. As such, the range between the 40th percentile and the 20th percentile represents a slight deviation from 'normal' conditions to a significant variation from 'normal' conditions. Refer to Table 1 for baseline ratios.

† The control sites will include as a minimum the Bargo River (Site 300061) and may include other sites upstream of the impacts of longwall mining.

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Impact to pool water level	<p>AUTOMATED POOL WATER LEVEL</p> <p>Locations (refer to Figure 5-2)</p> <p><u>Impact sites:</u></p> <ul style="list-style-type: none"> Cedar Creek (CA, CB, CD, CE and CG) Matthews Creek (ME, MG) Stonequarry Creek (SA, SB, SC2) <p><u>Control sites:</u></p> <ul style="list-style-type: none"> Cedar Creek (CCR, CC1A) Matthews Creek (MB) Stonequarry Creek (SD, SE) <p>Frequency</p> <p><u>Pre-mining</u> – Continuous record, data downloaded monthly. Baseline data recorded since October 2018 in the Western Domain (excluding SC2 and SB).</p> <p><u>During mining</u> - Continuous record, data downloaded monthly.</p> <p><u>Post mining</u> - Continuous record, data downloaded monthly for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p> <p>MANUAL POOL WATER LEVEL</p> <p>Locations</p> <p><u>Impact sites:</u></p> <ul style="list-style-type: none"> Cedar Creek (CC, CF) Matthews Creek (MC, MD U/S (upstream), MF) <p><u>Control sites:</u></p> <ul style="list-style-type: none"> Matthews Creek (MA) Stonequarry Creek (SC) <p>Frequency</p> <p><u>Pre-mining</u> - Monthly manual level reading. Visual inspection of natural drainage behaviour using photo points. Baseline data recorded since October 2018 in the Western Domain.</p> <p><u>During mining</u> - Monthly manual level reading. Visual inspection of natural drainage behaviour using photo points.</p> <p><u>Post mining</u> - Monthly manual level reading and visual inspection of natural drainage behaviour using photo points for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	<p>Level 1</p> <ul style="list-style-type: none"> The recorded water level has not dropped below the previously recorded minimum level (in one 24 hour period for automated pool water level) (refer to Table 2 for baseline minimum recorded water level). 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Six monthly review of data. 	<ul style="list-style-type: none"> No response required.
			<p>Level 2</p> <ul style="list-style-type: none"> The recorded water level has dropped below the previously recorded minimum level (for more than one 24 hour period for automated pool water level) (refer to Table 2 for baseline minimum recorded water level). <p>AND</p> <ul style="list-style-type: none"> The above has occurred at one of the upstream pools (beyond mining effects). <p>AND</p> <ul style="list-style-type: none"> Visual monitoring of pools has not noted any mining related impacts. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Six monthly review of data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group.
			<p>Level 3</p> <ul style="list-style-type: none"> The recorded water level has dropped below the previously recorded minimum level (for more than one 24 hour period for automated pool water level) (refer to Table 2 for baseline minimum recorded water level). <p>AND</p> <ul style="list-style-type: none"> The above has occurred at one of the upstream pools (beyond mining effects). <p>AND</p> <ul style="list-style-type: none"> Visual monitoring of pools has noted mining related impacts. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Six monthly review of data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group. Consider increasing review of data to monthly.
			<p>Level 4</p> <ul style="list-style-type: none"> The recorded water level has dropped below the previously recorded minimum level (for more than one 24 hour period for automated pool water level) (refer to Table 2 for baseline minimum recorded water level). <p>AND</p> <ul style="list-style-type: none"> Similar behaviour has not occurred at one of the upstream pools (beyond mining effects). <p>AND</p> <ul style="list-style-type: none"> Visual monitoring of pools has noted mining related impacts. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Increase review of data to monthly. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess if the change in behaviour is related to LW W1-W2 mining effects, other catchment changes or the prevailing climate. 	<ul style="list-style-type: none"> Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). If it is concluded that there has been a mining-related impact then implement a corrective management action plan in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP).

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Impact to pool level, natural drainage behaviour or overland connected flow	<p>VISUAL INSPECTIONS</p> <p>Locations <u>Impact sites</u> - Stream reaches of Cedar Creek, Matthews Creek and Stonequarry Creek within the Study Area as illustrated in Figure 5-1 of the Water Management Plan. <u>Control sites</u> - Stream reaches of Cedar Creek, Matthews Creek and Stonequarry Creek outside of the Study Area as illustrated in Figure 5-1 of the Water Management Plan.</p> <p>Frequency <u>Pre-mining</u>- Observations prior to mining using fixed location photo points. Baseline data first recorded in 2014, and in November 2019 prior to mining. <u>During mining</u> - Observations every month during active subsidence period (after 200 m of secondary extraction of LW W1-W2) by Tahmoor Coal using fixed location photo points. Reduce frequency of observations to 2-monthly after 1000 m of extraction of LW W1-W2 for sections of valleys that are located behind the active subsidence zone unless continuing adverse changes are observed (refer to triggers in Level 4). <u>Post mining</u> - Observations using fixed location photo points on a 3-monthly basis for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	Level 1		
			<ul style="list-style-type: none"> No observed impacts to pool level, drainage or overland connected flow. 	<ul style="list-style-type: none"> Continue monthly monitoring. Continue monthly review of data. 	<ul style="list-style-type: none"> No response required.
			Level 2		
			<ul style="list-style-type: none"> Visually observed reduction in pool level, drainage or overland connected flow. <p>AND</p> <ul style="list-style-type: none"> The above has occurred at one of the upstream pools (beyond mining effects). <p>AND</p> <ul style="list-style-type: none"> Visual monitoring of pools has not noted any mining related impacts. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group.
			Level 3		
<ul style="list-style-type: none"> Rock bar and/or stream base cracking, or gas release, or increased iron precipitation noted during visual inspection. <p>AND</p> <ul style="list-style-type: none"> No reduction in pool water level, drainage or overland connected flow, taking into account climatic conditions and observations during baseline monitoring period. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess if the change in behaviour is related to LW W1-W2 mining effects, other catchment changes or the prevailing climate. 	<ul style="list-style-type: none"> As defined by Environmental Response Group. Consider increasing inspection and reporting frequency to fortnightly for sites where Level 3 has been reached. 			
Level 4					
<p>There appear to be impacts to natural drainage behaviour such that:</p> <ul style="list-style-type: none"> Visually observed reduction in pool water level, drainage or overland connected flow. <p>AND</p> <ul style="list-style-type: none"> The above change has not occurred at one of the upstream pools (beyond mining effects). 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess if the change in behaviour is related to LW W1-W2 mining effects, other catchment changes or the prevailing climate. Conduct visual inspection of downstream reaches beyond mining effects to identify if flow re-emergence is occurring. If flow re-emergence sites are located, implement water quality monitoring at these location(s). 	<ul style="list-style-type: none"> Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). If it is concluded that there has been a mining-related impact then implement a corrective management action plan in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP). 			

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Impact to flood levels	<p>FLOOD LEVELS</p> <p>Locations <u>Impact sites</u> - All dwellings within the 1% AEP flood extent</p> <p>Frequency <u>Pre-mining</u> – Pre-mine modelling (using surveyed pre-mine topography) to estimate 1% AEP flood levels and extents in areas potentially impacted by subsidence. Pre-mining modelling was completed in May 2019. <u>Post mining and subsidence</u> - Post-mine modelling (using surveyed post-mine topography) to estimate 1% AEP flood levels and extents in areas potentially impacted by subsidence.</p>	Level 1		
			<ul style="list-style-type: none"> No dwellings that were outside the pre-mine 1% AEP flood extent are within the post-mine 1% AEP flood extent. 	<ul style="list-style-type: none"> No action required. 	<ul style="list-style-type: none"> No response required.
			Level 4		
			<ul style="list-style-type: none"> Subsidence results in the post-mining 1% AEP flood level being above the floor level of one or more dwellings. 	<ul style="list-style-type: none"> Provide up-to-date predicted flood information (including actual subsidence and flooding predictions) to the State Emergency Service, Council and landowners. 	<ul style="list-style-type: none"> Negotiate remediation or compensation with landowners.

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
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Water Management Plan	Impacts to dams	<p>PRIVATE DAMS</p> <p>Locations <u>Impact sites</u> - FD-1 to FD-12 as shown in Figure 5-2</p> <p>Frequency <u>Pre-mining</u> - Dam embankment integrity and water level observation every month for at least two months immediately prior to undermining using fixed location photo points. Pre-mining inspections commenced in November 2019. <u>During mining</u> - Dam embankment integrity and water level observation every week by Tahmoor Coal and monthly by a Geotechnical Engineer during active subsidence period using fixed location photo points. <u>Post mining</u> - Dam embankment integrity and water level observation using fixed location photo points on a 3-monthly basis for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	Level 1		
			<ul style="list-style-type: none"> No cracks develop within dam wall (other than natural desiccation cracking). 	<ul style="list-style-type: none"> Continue weekly monitoring by Tahmoor Coal and monthly monitoring by geotechnical engineer during active subsidence period. Continue monthly review of data. 	<ul style="list-style-type: none"> No response required.
			Level 2		
			<ul style="list-style-type: none"> Development of small isolated cracks developed within dam wall <5 cm (other than natural desiccation cracking). 	<ul style="list-style-type: none"> Continue weekly monitoring by Tahmoor Coal and monthly monitoring by geotechnical engineer during active subsidence period. Continue monthly review of data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group.
			Level 3		
<ul style="list-style-type: none"> Development of cracking within dam wall > 5 cm (other than natural desiccation cracking) and isolated in nature. 	<ul style="list-style-type: none"> Continue weekly monitoring by Tahmoor Coal and monthly monitoring by geotechnical engineer during active subsidence period. Continue monthly review of data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group. Consider increasing to weekly monitoring by geotechnical engineer during active subsidence period. 			
Level 4					
<ul style="list-style-type: none"> Development of cracking within dam wall > 5 cm (other than natural desiccation cracking) and non-isolated in nature. Reduction in water holding capacity compared to baseline, taking into account climatic conditions; or cracking causing embankment instability. 	<ul style="list-style-type: none"> Weekly monitoring by geotechnical engineer during active subsidence period. Convene Tahmoor Coal Environmental Response Group to review response. Erect warning signs where necessary. Reduce dam water level by at least half dam volume, pending land access and land owner consent. 	<ul style="list-style-type: none"> Notify relevant Government Agencies and other stakeholders. Repair cracks and embankment instability at the completion of the active subsidence period by excavation, grouting and re-compaction where practical. 			

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Stream water quality impact	<p>STREAM WATER QUALITY</p> <p>Locations (refer to Figure 5-2)</p> <p>Impact sites:</p> <ul style="list-style-type: none"> Cedar Creek (CA, CB, CG) Matthews Creek (MC1, MG) Stonequarry Creek (SC2, SC, SD) <p>Control sites:</p> <ul style="list-style-type: none"> Cedar Creek (CC1) Matthews Creek (MB) Stonequarry Creek (SC1, SE) <p>Frequency</p> <p>Pre-mining- Monthly sampling for 12 months prior to secondary extraction. Baseline data was recorded at some site during 2014 and all sites since January 2019.</p> <p>During mining - Monthly sampling and analysis. Analysis is to comprise comparison of pH, EC and specific dissolved metals: manganese, nickel, zinc and iron recorded at sites within mining effects and at control (upstream) sites. The value at a given site (within mining effects) is to be compared with the corresponding control (upstream) site(s), and at the site itself, mean plus two standard deviations[‡] using the full period of data for the control (upstream) sites.</p> <p>For each surface water system:</p> <ul style="list-style-type: none"> Matthews Creek MC1 and MG results are to be compared with results from MB; Cedar Creek CB and CG results are to be compared with combined results from MB and CC1; Stonequarry Creek SC2, SC and SD are to be compared with combined results from MB, CC1, SC1 and SE. <p>Post mining - Monthly sampling and analysis for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	Level 1		
			<ul style="list-style-type: none"> The triggers for pH, EC and dissolved metals defined below do not occur, and there is no visual evidence of an increase in iron precipitation that was not observed in the baseline period. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Continue monthly review of data. 	<ul style="list-style-type: none"> No response required.
			Level 2		
			<ul style="list-style-type: none"> The trigger for pH, EC or dissolved metals defined below occurs in one month, and there is no visual evidence of an increase in iron precipitation that was not observed in the baseline period. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Continue monthly review of data including analysis of water quality trend along creek (upstream to downstream) to identify spatial changes. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group.
Level 3					
<ul style="list-style-type: none"> The trigger for pH, EC or dissolved metals defined below occurs in one month, and there is visual evidence of an increase in iron precipitation that was not observed in the baseline period. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Continue monthly review of data to assess if the trigger was exceeded during the baseline period prior to commencement of mining and undertake analysis of water quality trend along creek (upstream to downstream) to identify spatial changes. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by Environmental Response Group. Consider increasing monitoring to fortnightly at sites where Level 3 has been reached. 			
Level 4					
<p>Any of the following:</p> <ul style="list-style-type: none"> pH: the value* falls below a corresponding control (upstream) site(s), or at the site itself, mean minus two standard deviations (i.e. the sample becomes more acidic) for more than two consecutive months OR the value rises above corresponding control (upstream) site(s), or at the site itself, mean plus two standard deviations (i.e. the sample becomes more alkaline) for more than two consecutive months. EC: the value* rises above corresponding control (upstream) site(s), or at the site itself, mean plus two standard deviations for more than two consecutive months. Dissolved metals: a specific metal or metals laboratory value/s rises above corresponding control (upstream) site(s), or at the site itself, mean plus two standard deviations for more than two consecutive months. 	<ul style="list-style-type: none"> Continue monitoring as per monitoring program. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess if the change in behaviour is related to LW W1-W2 mining effects, other catchment changes or the prevailing climate. Immediately undertake additional water quality sampling and analysis of the site where the trigger has occurred and relevant control sites to confirm results and that the trigger exceedance is continuing. Undertake an investigation to assess if the change in behaviour is related to LW W1-W2 mining effects (e.g. whether there has been subsidence induced cracking upstream), other catchment changes, unrelated pollution or the prevailing climate. 	<ul style="list-style-type: none"> Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). If it is concluded that there has been a mining-related impact then implement a corrective management action plan in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP). 			

Footnote:

* Field and laboratory records of pH and EC are collected for quality assurance purposes. The field values will be used in the TARP assessment unless erroneous values are identified in which the laboratory values will be adopted in the assessment.

‡ Log transformations (i.e. base 10 logs of the water quality concentrations) will be used to calculate the arithmetic means and standard deviations. Log transformations are commonly applied to concentrations as part of statistical analyses in water resources studies as is evidenced by the following statement from a US Geological Survey publication regarding such analyses: "In order to make an asymmetric distribution become more symmetric, the data can be transformed or re-expressed into new units. These new units alter the distances between observations on a line plot. The effect is to either expand or contract the distances to extreme observations on one side of the median, making it look more like the other side. The most commonly-used transformation in water resources is the logarithm. Logs of water discharge, hydraulic conductivity, or concentration are often taken before statistical analyses are performed." (Helsel and Hirsch, 2002).

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Water Management Plan	Groundwater Quality at monitoring bores and private groundwater bores.	<p>GROUNDWATER QUALITY – Monitoring bores</p> <p>Locations (refer to Figure 3-3) <u>Impact sites</u> – P9, P12, P13, P14, P16 <u>Control sites</u> - P17</p> <p>Frequency <u>Pre-mining</u> - Field water quality and laboratory analysis monthly (refer to Section 5.2.1 for parameters). Baseline data available since May 2019. <u>During mining</u> - Field water quality and laboratory analysis monthly (refer to Section 5.2.1 for parameters). <u>Post mining</u> - Field water quality and laboratory analysis monthly (refer to Section 5.2.1 for parameters) for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p> <p>GROUNDWATER QUALITY – Private groundwater bores</p> <p>Locations (refer to Figure 3-3) <u>Control sites</u> - GW72402, GW105228, GW105467, and GW105546 and any other private bores where access is negotiated with landholder.</p> <p>Frequency <u>Pre-mining</u> - Field water quality (EC, pH) and iron staining. Pre-mining testing completed during bore census (GeoTerra, 2019). Baseline data was first collected in 2014, and further data was collected in March and April 2019. <u>During mining</u> - Field water quality and laboratory analysis on a 3-monthly basis (refer to Section 5.2.1 for parameters). <u>Post mining</u> - Field water quality and laboratory analysis on a 3-monthly basis (refer to Section 5.2.1 for parameters) for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	Level 1		
			<ul style="list-style-type: none"> No observable change in salinity, pH or metals outside of the baseline variability. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water quality data. 	<ul style="list-style-type: none"> No response required.
			Level 2		
			<ul style="list-style-type: none"> Short term increase (< 3 months) in salinity and/or metals, or change in pH outside of baseline variability*. The effect does not persist after a significant rainfall recharge event. <p>AND/OR</p> <ul style="list-style-type: none"> A similar trend or response has been noted at other monitored bores or private groundwater bores. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water quality data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by the Environmental Response Group.
Level 3					
<ul style="list-style-type: none"> Short term increase (< 3 months) in salinity and/or metals or change in pH outside of baseline variability*. The effect persists after a significant rainfall recharge event. <p>AND/OR</p> <ul style="list-style-type: none"> The change in water quality is determined not to be controlled by climatic or anthropogenic factors. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water quality data. Conduct review of data to confirm whether water level reduction is not caused by climatic or anthropogenic impacts. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by the Environmental Response Group. Consider increasing monitoring frequency at monitoring bores where Level 3 has been reached to fortnightly, and private groundwater bores where Level 3 has been reached to a more regular timeframe than ordinarily monitored as per negotiations with the landholder. Consider increasing review of data to fortnightly. 			
Level 4					
<ul style="list-style-type: none"> Medium to long term increase in salinity and / or metals or a change in pH outside of baseline variability* with the effect persisting for greater than 3 months or after a significant rainfall recharge event. <p>AND</p> <ul style="list-style-type: none"> The reduction in water level is determined not to be controlled by climatic or anthropogenic factors. 	<ul style="list-style-type: none"> Continue monitoring and review as per monitoring program or at revised frequency decided under Level 3 TARP response. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess whether change in behaviour is related to LW W1-W2 mining effects. 	<ul style="list-style-type: none"> Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). For monitoring bores: If it is concluded that there has been a mining-related impact, then implement a corrective management action plan for the site in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP). For private groundwater bores: If it is concluded that there has been a mining-related impact, then implement a corrective management action plan for the bore in accordance with the make good provisions (Section 6.2.4 of the Water Management Plan) in consultation with the affected landholder. 			

Footnote:

* Baseline variability is to be defined as soon as practicable after the commencement of extraction in the Western Domain using representative pre-mining data collected at each bore.

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Groundwater Levels at monitoring bores and private groundwater bores.	<p>GROUNDWATER LEVEL – Monitoring bores</p> <p>Locations (refer to Figure 3-3) <u>Impact sites</u> – P9, P12, P13, P14, P16 <u>Control sites</u> - P17</p> <p>Frequency <u>Pre-mining</u> - Minimum continuous 24-hourly readings with monthly logger download and dip meter. Baseline data available since May 2019. <u>During mining</u> - Minimum continuous 24-hourly readings with monthly logger download and dip meter. <u>Post mining</u> - Minimum continuous 24-hourly readings with monthly logger download and dip meter for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p> <p>GROUNDWATER LEVEL – Private groundwater bores</p> <p>Locations (refer to Figure 3-3) <u>Control sites</u> - GW72402, GW105228, GW105467, and GW105546 and any other private bores where access is negotiated with landholder.</p> <p>Frequency <u>Pre-mining</u> - Standing Water Level (where available) and yield data. Pre-mining testing completed in bore census (GeoTerra, 2019). Baseline data was first collected in 2014, and further data was collected in March and April 2019. <u>During mining</u> - Manual monitoring (flow rate and, where available, standing water level) on a 3-monthly basis. <u>Post mining</u> - Manual monitoring (flow rate and, where available, standing water level) on a 3-monthly basis for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	Level 1		
			<ul style="list-style-type: none"> Groundwater level remains consistent within baseline variability and/or pre-mining trends, with reductions in groundwater level not persisting after significant rainfall recharge events. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water level data. 	<ul style="list-style-type: none"> No response required.
			Level 2		
			<ul style="list-style-type: none"> Up to 2 m water level reduction over a period of up to 3 months following the commencement of extraction at LW W1. Groundwater level rise in response to significant rainfall recharge event is observed. <p>AND/OR</p> <ul style="list-style-type: none"> The reduction in water level is determined to be controlled by climatic factors or local bore usage for private water supply bores. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water level data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by the Environmental Response Group.
Level 3					
<ul style="list-style-type: none"> Up to 2 m water level reduction over a period of up to 3 months following the commencement of extraction at LW W1. Negligible water level rise in response to a significant rainfall recharge event. <p>AND/OR</p> <ul style="list-style-type: none"> The reduction in water level is determined not to be controlled by climatic or external anthropogenic factors. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water level data. Conduct review of data to confirm whether water level reduction is not caused by climatic or anthropogenic impacts. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by the Environmental Response Group. Consider increasing monitoring frequency at monitoring bores where Level 3 has been reached to fortnightly, and private groundwater bores where Level 3 has been reached to a more regular timeframe than ordinarily monitored as per negotiations with the landholder. Consider increasing review frequency to fortnightly. 			
Level 4					
<ul style="list-style-type: none"> Greater than 2 m water level reduction for a period greater than 3 months. <p>AND</p> <ul style="list-style-type: none"> Water level (for a specific depressurisation event) does not return to within 1 m of the pre 'event' level (or trend occurring prior to the 'event') after 6 months of the 'event'. <p>AND</p> <ul style="list-style-type: none"> The reduction in water level is determined not to be controlled by climatic or anthropogenic factors. 	<ul style="list-style-type: none"> Continue monitoring and review as per monitoring program or at revised frequency decided under Level 3 TARP response. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess whether change in behaviour is related to LW W1-W2 mining effects. 	<ul style="list-style-type: none"> Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). For monitoring bores: If it is concluded that there has been a mining-related impact, then implement a corrective management action plan for the site in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP). For private groundwater bores: If it is concluded that there has been a mining-related impact, then implement a corrective management action plan for the bore in accordance with the make good provisions (Section 6.2.4 of the Water Management Plan) in consultation with the affected landholder. 			

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Shallow Groundwater Pressures at VWPs TNC036, TNC040, and TNC043.	<p>GROUNDWATER PRESSURE</p> <p>Locations <u>Impact sites</u> – TNC36 and proposed bore to be drilled (refer to Section 5.2.2). <u>Control sites</u> - Groundwater bores/VWPs TNC40 and TNC43 (refer to Figure 3-3).</p> <p>Frequency <u>Pre-mining</u> - Minimum continuous 24-hourly readings with monthly logger download. Baseline data available since 2010. <u>During mining</u> - Minimum continuous 24-hourly readings with monthly logger download. <u>Post mining</u> - Minimum continuous 24-hourly readings with monthly logger download for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	Level 1		
			<ul style="list-style-type: none"> • No observable mining induced change at VWP intakes located at or above 200 m depth. 	<ul style="list-style-type: none"> • Continue monitoring program. • Ongoing review of water level data. 	<ul style="list-style-type: none"> • No response required.
			Level 2		
			<ul style="list-style-type: none"> • Up to 5 m water level reduction in VWP intakes located at or above (i.e. shallower than) 200 m depth over a period of up to 3 months following the commencement of extraction at LW W1. Groundwater level rise in response to significant rainfall recharge event is observed. <p>AND/OR</p> <ul style="list-style-type: none"> • The reduction in water level is determined to be controlled by climatic factors. 	<ul style="list-style-type: none"> • Continue monitoring program. • Ongoing review of water level data. • Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> • As defined by the Environmental Response Group.
			Level 3		
<ul style="list-style-type: none"> • Up to 5 m water level reduction in VWP intakes located at or above (i.e. shallower than) 200 m depth over a period of up to 3 months following the commencement of extraction at LW W1. Negligible response following a significant rainfall recharge event. <p>AND/OR</p> <ul style="list-style-type: none"> • The reduction in water level is determined not to be controlled by climatic or anthropogenic factors. 	<ul style="list-style-type: none"> • Continue monitoring program • Ongoing review of water level data. • Conduct review of data to confirm whether water level reduction is not caused by climatic or anthropogenic impacts. • Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> • As defined by the Environmental Response Group. • Consider increasing download frequency at groundwater bores where Level 3 has been reached to a fortnightly basis. Consider increasing review frequency to fortnightly. 			
Level 4					
<ul style="list-style-type: none"> • Greater than 5 m water level reduction in VWP intakes located at or above (i.e. shallower than) 200 m depth for a period greater than 3 months. <p>AND</p> <ul style="list-style-type: none"> • Water level (for a specific depressurisation event) does not return to within 5m of the pre 'event' level (or trend occurring prior to the 'event') after 6 months of the 'event' in VWP intakes located at or above 200 m depth. <p>AND</p> <ul style="list-style-type: none"> • The reduction in water level is determined not to be controlled by climatic or anthropogenic factors. 	<ul style="list-style-type: none"> • Continue monitoring and review as per monitoring program or at revised frequency decided under Level 3 TARP response. • Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess whether change in behaviour is related to LW W1-W2 mining effects. 	<ul style="list-style-type: none"> • Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). • If it is concluded that there has been a mining-related impact, then implement a corrective management action plan in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP). 			

Key Component Plan	Feature	Methodology and relevant monitoring	Management		
			Trigger	Action	Response
Water Management Plan	Deep Groundwater Pressures at VWPs TNC036, TNC040, and TNC043.	<p>GROUNDWATER PRESSURE</p> <p>Locations</p> <p><u>Impact sites</u> – TNC36 and proposed bore to be drilled (refer to Section 5.2.2).</p> <p><u>Control sites</u> - Groundwater bores/VWPs TNC40 and TNC43 (refer to Figure 3-3).</p> <p>Frequency</p> <p><u>Pre-mining</u> - Minimum continuous 24-hourly readings with monthly logger download. Baseline data available since 2010. - Minimum continuous 24-hourly readings with monthly logger download.</p> <p><u>During mining</u> - Minimum continuous 24-hourly readings with monthly logger download.</p> <p><u>Post mining</u> - Minimum continuous 24-hourly readings for 12 months after LW W2 completed. Monthly logger downloaded for 12 months following the completion of LW W2. This period may be extended as per the decision by the Environmental Response Group (refer to Section 5.2 for further details).</p>	Level 1		
			<ul style="list-style-type: none"> Observed data does not exceed predicted (modelled) impacts at VWP intakes located below (i.e. deeper than) 200 m depth (excluding those monitoring the Bulli Coal Seam). 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water level data. 	<ul style="list-style-type: none"> No response required.
			Level 2		
			<ul style="list-style-type: none"> Calculated or observed drawdown (based on 2009-2015 baseline data) for VWP intakes below 200 m depth (excluding those within the Bulli Coal Seam) is within 30 m of predicted (modelled) drawdown. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water level data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by the Environmental Response Group.
			Level 3		
<ul style="list-style-type: none"> Calculated or observed drawdown (based on 2009-2015 baseline data) for VWP intakes below 200 m depth (excluding those within the Bulli Coal Seam) exceeds predicted (modelled) drawdown by 30 m for a period of 6 months or more. 	<ul style="list-style-type: none"> Continue monitoring program. Ongoing review of water level data. Convene Tahmoor Coal Environmental Response Group to review response. 	<ul style="list-style-type: none"> As defined by the Environmental Response Group. Consider increasing download frequency at groundwater bores where Level 3 has been reached to a fortnightly basis. Consider increasing review frequency to fortnightly. 			
Level 4					
<ul style="list-style-type: none"> Calculated or observed drawdown (based on 2009-2015 baseline data) for VWP intakes below 200 m depth (excluding those within the Bulli Coal Seam) exceeds predicted (modelled) drawdown by 30 m for a period of 12 months or more. 	<ul style="list-style-type: none"> Continue monitoring and review as per monitoring program. Convene Tahmoor Coal Environmental Response Group to undertake an investigation to assess whether change in behaviour is related to LW W1-W2 mining effects. 	<ul style="list-style-type: none"> Report to DPIE within 7 days of investigation completion (according to Table 6-1 of the Extraction Plan Main Document). If it is concluded that there has been a mining-related impact, then implement a corrective management action plan in accordance with a timeframe as recommended by the Environmental Response Group in consultation with the NSW DPIE Resources Regulator (refer to Section 6.2.2 of the WMP). 			

The baseline ratio of monitored to modelled flows for each trigger level proposed to assess the downstream reduction in catchment flow rate in Stonequarry Creek at Picton Gauging Station (GS212053) are presented Table 1. As specified in Table 1, the 40th and 20th percentiles of the baseline data have been adopted for each trigger level. The 20th percentile is an accepted metric of a significant variation from 'normal' conditions while the 40th percentile represents a slight deviation from the median or 'normal' conditions. As such, the range between the 40th percentile and the 20th percentile represents a slight deviation from 'normal' conditions to a significant variation from 'normal' conditions.

Table 1 Baseline Ratio of Monitored to Modelled Flow

Surface Water System	Adjusted Baseline Ratio of Monitored to Modelled Flow	
Stonequarry Creek at Picton (GS212053)	20 th Percentile	0.52
	40 th Percentile	0.79

Table 2 Baseline Minimum Recorded Water Level

Surface Water System	Monitoring Site	Minimum Recorded Water Level (m AHD)*
Matthews Creek	MB	219.048
	ME	201.313
	MG	189.057
Cedar Creek	CC1A	0.668 (m)
	CA	180.448
	CB	178.872
	CD	172.822
	CE	171.709
	CG	170.345
Stonequarry Creek	SA	167.799
	SD	160.285

Footnote:

* Subject to additional baseline data acquisition for the period prior to non-negligible subsidence from LW W1.

Key Component Plan	Feature	Management	
		Trigger	Action
Land Management Plan	Cliff line damage or instability	Normal	
		<ul style="list-style-type: none"> Surface cracking < 5 cm wide on top of cliff line, minor visible cracking on cliff face, or rock fall of isolated blocks. 	<ul style="list-style-type: none"> Continue monitoring.
		Within Prediction	
		<ul style="list-style-type: none"> Surface cracking 5 – 10 cm wide on top of cliff line, substantial visible cracking on rock face, or rock fall of isolated blocks. 	<ul style="list-style-type: none"> Continue monitoring. Erect warning signs and danger tape in immediate area. Geotechnical engineer inspection to determine need for further action/investigation.
Exceeds Prediction			
		<ul style="list-style-type: none"> Surface cracking > 10cm wide, major damage to cliff face or rock fall of > 100m³. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Increase monitoring by geotechnical engineer during active subsidence period to weekly. Erect warning signs and danger tape in immediate area. Geotechnical engineer inspection to determine need for further action/investigation. Notify Regulator and other stakeholders.

Key Component Plan	Feature	Management	
		Trigger	Action
Land Management Plan	Steep slope damage or instability	Normal	
		<ul style="list-style-type: none"> Surface cracking < 5 cm wide on slope, or rock fall of isolated blocks. 	<ul style="list-style-type: none"> Continue monitoring.
		Within Prediction	
		<ul style="list-style-type: none"> Surface cracking 5 – 10 cm wide on slope, small rock fall. 	<ul style="list-style-type: none"> Continue monitoring. Repair cracks at the completion of the active subsidence period. Erect warning signs and danger tape where necessary.
Exceeds Prediction		<ul style="list-style-type: none"> Surface cracking > 10 cm wide, substantial rock fall, tree fall. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Increase monitoring by geotechnical engineer during active subsidence period to weekly. Repair cracks at the completion of the active subsidence period. Erect warning signs and danger tape where necessary. Geotechnical engineer inspection to determine need for further action/investigation. Notify Regulator and other stakeholders.

Key Component Plan	Feature	Management	
		Trigger	Action
Land Management Plan	Surface cracking	Normal	
		<ul style="list-style-type: none"> Surface cracking < 5 cm. 	<ul style="list-style-type: none"> Continue monitoring. Repair cracks at the completion of the active subsidence period.
		Within Prediction	
		<ul style="list-style-type: none"> Surface cracking 5 – 10 cm. 	<ul style="list-style-type: none"> Continue monitoring. Repair cracks at the completion of the active subsidence period. Erect warning signs where necessary.
		Exceeds Prediction	
		<ul style="list-style-type: none"> Surface cracking > 10 cm wide, substantial rock fall, tree fall. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Increase monitoring by geotechnical engineer during active subsidence period to weekly. Repair cracks at the completion of the active subsidence period. Repair cracks > 10 cm in width with excavation, grouting and re-compaction where practical. Erect warning signs where necessary. Geotechnical engineer inspection to determine need for further action/investigation. Notify Regulator and other stakeholders.

Key Component Plan	Feature	Management	
		Trigger	Action
Land Management Plan	Agricultural land	Normal	
		<ul style="list-style-type: none"> • Development of subsidence and impact as predicted. • Vertical subsidence within predicted range. • Negligible impact to agricultural productivity or use of the land. • Negligible change to ponding. • No or minor impact to buildings or improvements. • Negligible increase in soil or tunnel erosion. 	<ul style="list-style-type: none"> • Continue monitoring. • Repair any subsidence impacts at the completion of the active subsidence period.
		Within Prediction	
		<ul style="list-style-type: none"> • Development of subsidence exceeding or potentially exceeding prediction. • Impact to agricultural land from subsidence or increased flooding or ponding within predicted impacts. • Minor increase in ponding or changes to drainage systems that can be remediated. 	<ul style="list-style-type: none"> • Monthly monitoring by Tahmoor Coal during active subsidence period. • Repair any subsidence impacts at the completion of the active subsidence period.
		Exceeds Prediction	
		<ul style="list-style-type: none"> • Development of subsidence and impact greater than expected. • Significant impact and change to agricultural land functionality or agricultural productivity greater than predicted and approved. 	<ul style="list-style-type: none"> • Convene Tahmoor Coal Environmental Response Group to review response. • Increase monitoring by geotechnical engineer during active subsidence period to weekly. • Repair any subsidence impacts at the completion of the active subsidence period with excavation, re-leveling and re-compaction where required. • Erect warning signs where necessary. • Notify Regulator and other stakeholders.

Key Component Plan	Feature	Management	
		Trigger	Action
Biodiversity Management Plan	Decline or significant negative change in macroinvertebrate indicators. These indicators include: <ul style="list-style-type: none"> • Density • Family richness • Community assemblages • EPT index • SIGNAL score • AUSRIVAS score 	Normal	
		<ul style="list-style-type: none"> • Monitoring macroinvertebrate indicators are within range of baseline data as supported by statistical analysis. 	<ul style="list-style-type: none"> • Continue subsidence monitoring program and biodiversity monitoring program.
		Within Prediction	
		<ul style="list-style-type: none"> • One or more macroinvertebrate indicators are not within range of baseline data as supported by statistical analysis. <p>AND ONE OR BOTH OF THE FOLLOWING:</p> <ul style="list-style-type: none"> • Subsidence monitoring program identifies potential for impact to watercourse parameters associated with aquatic habitat areas compared to baseline (e.g. cracking). • Surface monitoring program identifies potential impacts to hydrology/water quality parameters compared to baseline. 	<ul style="list-style-type: none"> • Continue monitoring programs. • Review and confirm monitoring data, cross check aquatic biodiversity monitoring data against other related environmental data (e.g. control sites and benchmark data) and subsidence monitoring upon identification of the potential trigger. • Undertake further investigations as appropriate to confirm the potential issue and analyse data with the aim of determining whether the exceedance is likely to be mining related. • Assess need for any increase to monitoring frequency or additional monitoring where relevant.
Exceeds Prediction			
<ul style="list-style-type: none"> • Monitoring indicates that three or more macroinvertebrate indicators are not within range of baseline data as supported by statistical analysis. <p>AND ONE OR BOTH OF THE FOLLOWING:</p> <ul style="list-style-type: none"> • Subsidence monitoring identifies mining induced impacts compared to baseline watercourse parameters associated with aquatic habitat (e.g. cracking). • Surface monitoring program identifies significant impacts to hydrology/water quality that exceed predictions compared to baseline. 	<ul style="list-style-type: none"> • Convene Tahmoor Coal Environmental Response Group to review response. • Implement Adaptive Management process as detailed within the Extraction Plan. • Notify OEH and relevant stakeholders within 7 days of current findings and proposed approach for investigation upon identification of the potential trigger. • Provide written Status Report to NSW Resources Regulator – Director Compliance Operations within 4 weeks of notification reviewing requirement, need and potential cost/benefit of preparation and implementation of a corrective action management plan. • Investigate the potential cause / fate of any biodiversity level trigger exceedance. • Report notification in End of Panel report and Annual Review. 		

Key Component Plan	Feature	Management	
		Trigger	Action
Biodiversity Management Plan	Reduction in aquatic habitat through loss of pools or associated reduction in water quality (AUSRIVAS habitat assessment)	Normal	
		<ul style="list-style-type: none"> Visual monitoring indicates aquatic habitat parameters are similar to baseline observations at aquatic ecology monitoring sites. 	<ul style="list-style-type: none"> Continue subsidence monitoring program and aquatic biodiversity monitoring program.
		Within Prediction	
		<ul style="list-style-type: none"> Visual monitoring indicates potential change in aquatic habitat compared to baseline observations at aquatic ecology monitoring sites. <p>AND ONE OR BOTH OF THE FOLLOWING:</p> <ul style="list-style-type: none"> Subsidence monitoring identifies potential for impact to watercourse parameters associated with macroinvertebrate indicators compared to baseline. Surface monitoring program identifies potential for impact to hydrology/water quality parameters compared to baseline. 	<ul style="list-style-type: none"> Continue monitoring programs. Review and confirm monitoring data, cross check aquatic biodiversity monitoring data against other related environmental data (e.g. control sites and benchmark data) and subsidence monitoring upon identification of the potential trigger. Undertake further investigations as appropriate to confirm the potential issue and analyse data with the aim of determining whether the exceedance is likely to be mining related. Assess need for any increase to monitoring frequency or additional monitoring where relevant.
Exceeds Prediction			
		<ul style="list-style-type: none"> Visual monitoring indicates a significance change in aquatic habitat compared to baseline observations at aquatic ecology monitoring sites. <p>AND ONE OR BOTH OF THE FOLLOWING:</p> <ul style="list-style-type: none"> Subsidence monitoring identifies potential for impact to watercourse parameters associated with macroinvertebrate indicators compared to baseline. Surface monitoring program identifies potential for impact to hydrology/water quality parameters compared to baseline. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Implement Adaptive Management process as detailed within the Extraction Plan. Notify OEH and relevant stakeholders within 7 days of current findings and proposed approach for investigation upon identification of the potential trigger. Provide written Status Report to NSW Resources Regulator – Director Compliance Operations within 4 weeks of notification reviewing requirement, need and potential cost/benefit of preparation and implementation of a corrective action management plan. Investigate the potential cause / fate of any biodiversity level trigger exceedance. Report notification in End of Panel report and Annual Review.

Key Component Plan	Feature	Management	
		Trigger	Action
Biodiversity Management Plan	Decline in amphibian populations within watercourses of the Study Area	Normal	
		<ul style="list-style-type: none"> Monitoring indicates amphibian population parameters are predominantly within a reasonable range of baseline data as supported by statistical analysis. 	<ul style="list-style-type: none"> Continue subsidence monitoring program and biodiversity monitoring program.
		Within Prediction	
		<ul style="list-style-type: none"> Monitoring indicates amphibian population parameters are predominantly not within a reasonable range of baseline data as supported by statistical analysis. <p>AND</p> <ul style="list-style-type: none"> Subsidence monitoring program identifies potential for impact of watercourse parameters associated with sensitive amphibian habitat areas compared to baseline. 	<ul style="list-style-type: none"> Continue monitoring programs. Review and confirm monitoring data, cross check biodiversity monitoring data against other related environmental data (e.g. control sites and benchmark data) and subsidence monitoring upon identification of the potential trigger. Undertake further investigations as appropriate to confirm the potential issue and analyse data with the aim of determining whether the exceedance is likely to be mining related. Assess need for any increase to monitoring frequency or additional monitoring where relevant.
Exceeds Prediction		<ul style="list-style-type: none"> Monitoring indicates amphibian population parameters are significantly not within a reasonable range of baseline data as supported by statistical analysis. <p>AND</p> <ul style="list-style-type: none"> Mining induced impacts (exceeds predicted compared to baseline) for watercourse parameters associated with sensitive amphibian habitat are identified by environmental monitoring. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Notify OEH and relevant stakeholders within 7 days of current findings and proposed approach for investigation upon identification of the potential trigger. Provide written Status Report to NSW Resources Regulator – Director Compliance Operations within 4 weeks of notification reviewing requirement, need and potential cost/benefit of preparation and implementation of a corrective action management plan. Investigate the potential cause / fate of any biodiversity level trigger exceedance. Report notification in End of Panel report and Annual Review.

Key Component Plan	Feature	Management	
		Trigger	Action
Biodiversity Management Plan	Dieback of riparian vegetation within watercourses of the Study Area	Normal	
		<ul style="list-style-type: none"> Monitoring indicates riparian vegetation parameters are predominantly within a reasonable range of baseline data as supported by statistical analysis. 	<ul style="list-style-type: none"> Continue subsidence monitoring program and biodiversity monitoring program.
		Within Prediction	
		<ul style="list-style-type: none"> Monitoring indicates riparian vegetation parameters are predominantly not within a reasonable range of baseline data as supported by statistical analysis. <p>AND</p> <ul style="list-style-type: none"> Subsidence monitoring program identifies potential for impact of watercourse parameters associated with sensitive riparian habitat areas. 	<ul style="list-style-type: none"> Continue monitoring programs. Review and confirm monitoring data, cross check Biodiversity monitoring data against other related environmental data (e.g. control sites and benchmark data) and subsidence monitoring upon identification of the potential trigger. Undertake further investigations as appropriate to confirm the potential issue and analyse data with the aim of determining whether the exceedance is likely to be mining related. Assess need for any increase to monitoring frequency or additional monitoring where relevant.
Exceeds Prediction			
		<ul style="list-style-type: none"> Monitoring indicates riparian vegetation parameters are significantly not within a reasonable range of baseline data as supported by statistical analysis. <p>AND</p> <ul style="list-style-type: none"> Mining induced impacts (exceeds predication compared to baseline) for watercourse parameters associated with riparian vegetation are identified by environmental monitoring. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Notify OEH and relevant stakeholders within 7 days of current findings and proposed approach for investigation upon identification of the potential trigger. Provide written Status Report to NSW Resources Regulator – Director Compliance Operations within 4 weeks of notification reviewing requirement, need and potential cost/benefit of preparation and implementation of a corrective action management plan. Investigate the potential cause / fate of any biodiversity level trigger exceedance. Report notification in End of Panel report and Annual Review.

Key Component Plan	Feature	Management	
		Trigger	Action
Heritage Management Plan	Aboriginal Heritage	Normal	
		<ul style="list-style-type: none"> Aboriginal heritage site monitoring indicates no detectable environmental consequences. 	<ul style="list-style-type: none"> Continue monitoring and management of sites in accordance with the HMP (Section 5 and Section 6).
		Within Prediction	
		<ul style="list-style-type: none"> Aboriginal heritage site monitoring indicates no detectable environmental consequences. 	<ul style="list-style-type: none"> Continue monitoring and management of sites in accordance with the HMP (Section 5 and Section 6).
		Exceeds Prediction	
		<ul style="list-style-type: none"> Aboriginal heritage site monitoring indicates environmental consequences exceeds predictions. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Notify RAPs within 1 week of the event and co-ordinate a site inspection with RAPs. Notify DPE and OEH within one week of the event. Investigate exceedance of subsidence prediction. Continue monitoring and management of sites in accordance with the HMP (Section 5 and Section 6). Investigate and implement any additional management measures and contingency plan (Section 6) as required in consultation with RAPs, OEH and DPE. Review mine design/predictions against mine criteria. Review monitoring program and modify if necessary.

Key Component Plan	Feature	Management	
		Trigger	Action
Heritage Management Plan	Historical Heritage (culverts only) (refer to QMVH Management Plan and Mill Hill Management Plan for TARPs applicable to QVMH and Mill Hill)	Normal	
		<ul style="list-style-type: none"> Historical heritage site monitoring indicates no detectable environmental consequences. 	<ul style="list-style-type: none"> Continue monitoring and management of sites in accordance with the HMP (Section 5 and Section 6).
		Within Prediction	
		<ul style="list-style-type: none"> Historical heritage site monitoring indicates no detectable environmental consequences. 	<ul style="list-style-type: none"> Continue monitoring and management of sites in accordance with the HMP (Section 5 and Section 6).
		Exceeds Prediction	
		<ul style="list-style-type: none"> Historical heritage site monitoring indicates environmental consequences exceeds predictions. 	<ul style="list-style-type: none"> Convene Tahmoor Coal Environmental Response Group to review response. Co-ordinate a site inspection with a structural engineer and qualified archaeologist or heritage architect. Notify DPE and OEH within one week of the event. Investigate exceedance of subsidence prediction. Continue monitoring and management of sites in accordance with the HMP (Section 5 and Section 6). Investigate and implement any additional management measures as recommended and contingency plan (Section 6) as required in consultation with OEH and DPE. Review mine design/predictions against mine criteria. Review monitoring program and modify if necessary.