28 December 2024

Richard Nguyen
Lead Operations Engineer – Networks West
Sydney Water

Amendment No. 2 to Subsidence Management Plan for Sydney Water Potable infrastructure due to shortening of LW S4A and planned mitigation measures at creek, Remembrance Drive and Main Southern Railway crossings prior to influence of LWs S4A to S6A (Revision B)

Dear Richard,

Please be advised that a minor amendment can be made to the Management Plan, which is titled *MSEC1193-04 SIMEC Mining – Tahmoor South Longwalls S1A to S6A – Management Plan for potential impacts to Sydney Water Potable Water Infrastructure, Revision B*.

Tahmoor Coal has shortened LW S4A by approximately 104 metres at the commencing end, as shown in Drawing No. MSEC1446-01. The effect of the change is to very slightly reduce the amount and extent of subsidence that will be experienced along Sydney Water infrastructure along Remembrance Drive and Great Southern Road, including at the water main crossing beneath the Main Southern Railway, as shown in Drawing No. MSEC1446-07.

The Management Plan documents the commencement of monitoring measures for LW S4A, most of which are defined based on a length of extraction. As LW S4A has been shortened at the commencing end, the commencing lengths of extraction for monitoring activities requires a change.

Based on the above, Tahmoor Coal has reviewed the risk control procedures in Table 4.1 of the Management Plan with respect to LW S4A. It can be seen that the proposed changes effectively bring forward the planned timing of surveys and inspections along Remembrance Drive. Table 4.1 has also been updated with respect to the contractor that is responsible for conducting visual inspections. Tahmoor Coal is currently conducting the inspections in-house and may appoint a contractor in future.

Please see attached revised Drawing No. MSEC1193-04-01, Revision D, which shows the location of Sydney Water potable water infrastructure relative to the mine layout, and Drawing No. MSEC1193-01-01, Revision C, which shows the location of subsidence monitoring locations.

Table 4.1 has also been updated to reflect the selection and installation of risk controls at the Tributary to Teatree Hollow crossing north of the intersection of Remembrance Drive and Yarran Road, at the creek crossing adjacent to the Main Southern Railway at 100.425 km, and at the Remembrance Drive and Main Southern Railway watermain crossings. The additional controls were developed following a risk assessment that was conducted on 11 June 2024 and reviewed on 13 December 2024 (Axys, 2024b). The additional controls are discussed below.

Creek crossing north of intersection of Remembrance Drive and Yarran Road (Creek 2)

Tahmoor Coal and Sydney Water have agreed to implement the following reasonably practicable risk controls at the creek crossing north of the intersection of Remembrance Drive and Yarran Road which are in addition to the risk controls for the majority of the water main, as described in the Management

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Plan. The site has been imaginatively named Creek 2 for ease of reference and its location is shown in Figure 1. The following controls are in addition to the risk controls for the majority of the water main.

- Installation of Gibault expansion joints on both sides of Creek 2.
- Displacement sensors have been installed on the joints.

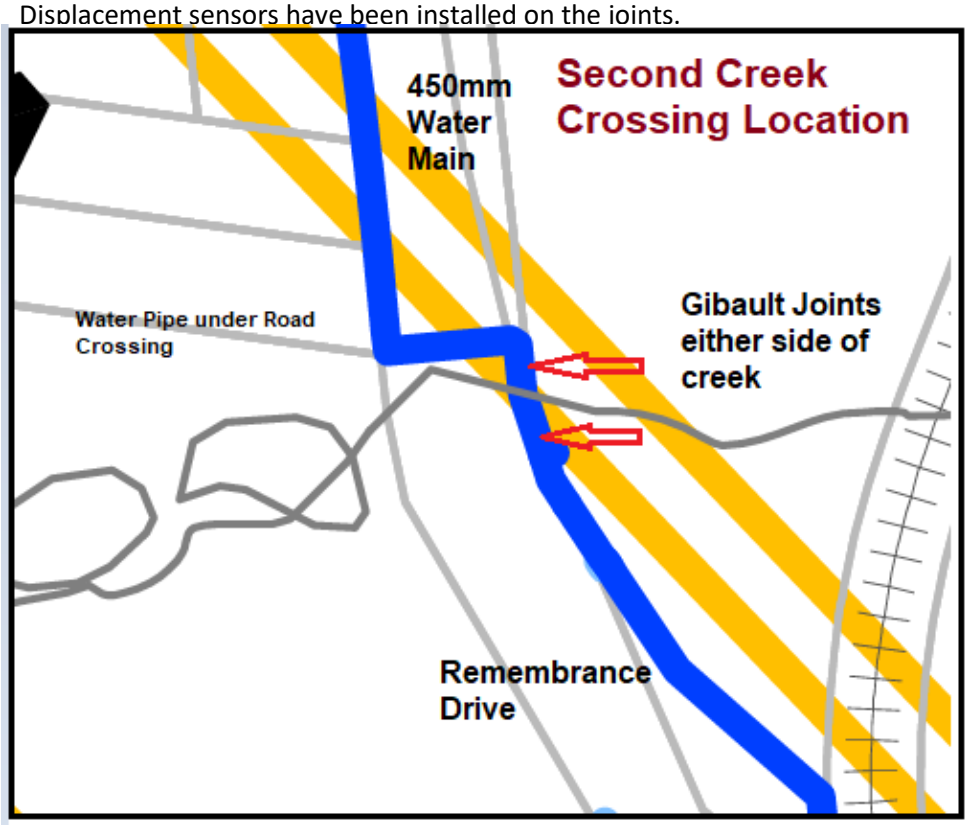


Figure 1 **Locations of Gibault Joints on both sides of Creek 2**

Figure 2 **View of Creek 2 excavation site to install joints**

Photographs of the Gibault joints and displacement sensors are shown in Figure 3.

Photographs courtesy Sweeting Consulting

Figure 3 Gibault joints and sensors at Creek 2

Remembrance Drive crossing north of Creek 2

As discussed in the Management Plan, the 450 mm diameter CICL water main crosses beneath Remembrance Drive between Caloola and Yarran Roads, directly above the chain pillar between LWs S4A and S5A, as shown in Drawing No. MSEC1193-04-01. The crossing consists of direct buried CICL pipe sections with two right angle bends at a cut-fill interface along Remembrance Drive.

Sydney Water's GIS shapefiles indicate the pipes are direct buried CICL pipe sections that are not concrete encased. There is good access at both ends of each crossing, as shown in Figure 4.

Figure 4 Google Streetview image of crossing beneath Remembrance Drive

As discussed in the Management Plan, the likelihood of mining-induced impacts at the Remembrance Drive crossing north of Creek 2 is similar to those along the majority of the water main. There is, however, a chance of impacts to pipe joints that are located at the right angle bends because the bends could act as anchor points in the ground as the pipe sections slide relative to them.

Tahmoor Coal and Sydney Water have agreed to implement the following reasonably practicable risk controls at the road crossing site, which are in addition to the risk controls for the majority of the water main, as described in the Management Plan.

- Installation of Gibault joint north of Creek 2, which has reduced the potential for impacts on the right angle bend at the southbound (eastern) side of the crossing;
- Installation of additional survey marks in local 3D around the crossing.

In the event that increased ground strains are observed at the road crossing, access is available to excavate and install additional Gibault joints at the crossing if required, particularly between the extraction of LWs S4A and S5A.

Stop valves are also present at Creek 2, immediately upstream of the road crossing and at Caloola Road, downstream of the road crossing, which limits the number of affected Sydney Water customers that would be affected if repairs must be conducted. Traffic management would be required to safely access the damaged pipeline.

Creek crossing adjacent to the Main Southern Railway at 100.425 km (Creek 3)

Sydney Water and Tahmoor Coal have conducted site investigations and considered additional risk control options for the creek crossing adjacent to the Main Southern Railway at 100.425 km. The site has been named Creek 3 for ease of reference.

The shortening of LW S4A has slightly reduced the predicted closure that may occur at the crossing due to the extraction of LW S4A. A comparison between predicted subsidence and valley related movements

Valley-related movements could be experienced in these locations. A summary comparison of maximum predicted conventional subsidence and valley related movements for Creek 3 is provided in Table 1. The table compares predicted movements due to the shortened LW S4A with the predictions that were provided in the Management Plan.

Table 1 Predicted Conventional Subsidence and Valley Related Movements for the railway creek crossing at 100.425 km (Creek 3, with changes since Management Plan in blue)

Longwall	Maximum Predicted Total Subsidence (mm)	Maximum Predicted Total Hogging Curvature (1/km)	Maximum Predicted Total Sagging Curvature (1/km)	Maximum Predicted Total Upsidence (mm)	Maximum Predicted Total Closure (mm)
LW S1A	<20	< 0.01	< 0.01	<20	<20
LW S2A	<20	< 0.01	< 0.01	<20	<20
LW S3A	2030	< 0.01	< 0.01	<20	<20
LW S4A	90110	< 0.01	< 0.01	2530	2030
LW S5A	1000	0.040.05	-0.13-0.12	90100	4550
LW S6A	1275	0.040.05	-0.14-0.12	125150	6075

It can be seen from Table 1 that predicted subsidence, closure and upsidence movements due to the extraction of LW S4A at the crossing at Creek 3 have slightly reduced.

For future LWs S5A and S6A, there were no changes in predicted total subsidence as the changes were within MSEC's rounding conventions. It can also be seen that the maximum predicted sagging curvature due to the extraction of LWs S5A and S6A are slightly greater than originally predicted as the planned extraction heights have been slightly increased.

In light of the shortening of LW S4A, Tahmoor Coal and Sydney Water have agreed to implement the following reasonably practicable risk controls at the creek crossing site due to the mining of LWs S4A to S6A, which are in addition to the risk controls for the majority of the water main, as described in the Management Plan.

- Installation of Gibault joints on both sides of the crossing at Creek 3, prior to the influence of LW S5A (subject to confirmation of the LW S5A mine plan).
- Displacement sensors will also be installed on the joints.

Management of potential impacts during the mining of LW S4A

It is considered that the existing joints in the potable water pipework will be adequate to manage the potential valley closure movements during the mining of LW S4A, even if greater than predicted closure occurs. This has been demonstrated from experience at other locations along the water main that have accommodated increased compressive strains without Gibault joints during the mining of LWs S1A to S3A as shown in Table 1.

Table 1 Observed increased closure and compressive strains along Sydney Water 450 mm CICL potable water main along Remembrance Drive during mining of LWs S1A to S3A where Gibault joints have not been installed

Location	Maximum closure over long bay lengths (mm)	Average compressive strain over long bay lengths (mm/m)	Maximum closure over 20m bay length (mm)	Compressive strain over 20m bay length (mm/m)	Comments
Bump 1 Pegs R47 to R48	38 mm over 20m	1.9 mm/m	38 mm	1.9 mm/m	Due to LW S1A prior to installation of Gibault joints in late October 2023
Bump 2 Pegs R54 to R55	42 mm over 20m	2.1 mm/m	42 mm	2.1 mm/m	Mainly due to LW S2A Gibault joints not installed
Bump 3 Pegs R59 to R61	26 mm over 40m	0.6 mm/m	17 mm	0.8 mm/m	Mainly due to LW S2A Gibault joints not installed
Caloola South Pegs R78C to R81C	82 mm over 60m	1.4 mm/m	50 mm	2.6 mm/m	Mainly due to LW S3A Gibault joints not installed south of intersection at Caloola Road

In the event that increased ground strains are observed at the creek crossing, access is available to excavate and install additional Gibault joints at the crossing if required, particularly between the extraction of LWs S4A and S5A. Access is also available to repair the pipework, if required.

Stop valves are also present upstream and downstream of the creek crossing, which limits the number of affected Sydney Water customers that would be affected if emergency repairs must be conducted.

Management of potential impacts during the mining of LW S5A

Tahmoor Coal and Sydney Water identified two risk control options:

1. Replace existing CICL pipework with new pipework that crosses beneath the crossing at Creek 3 and the Main Southern Railway at 100.380 km via a directional horizontal bore. The bore would consist of a PVC sleeve bore that would be grouted to the host rockmass, with a polyethylene (PE) water pipeline sleeved inside it.
2. Install Gibault joints on both sides of the crossing at Creek 3 and manage potential impacts at the rail crossing at 100.380 km.

Option 1 was initially selected as it could reduce the potential for impacts at both the creek crossing and rail crossing. The work, however, required timely design and implementation by Sydney Water's appointed contractor for the Western Region. The project has experienced significant delays to the point that the project is unlikely to be completed before the commencement of LW S5A.

Option 2 has, therefore, been selected as the preferred risk control option as it can be implemented in a timely manner and has proven to be effective during the mining of LWs S1A to S3A.

The two Gibault joints have a combined capacity of accommodating 100 mm of closure in addition to the existing capacity of the spigot and socket CICL joints to accommodate ground closure. The total combined capacity is estimated to be more than twice the capacity of the predicted total closure at the crossing. The Gibault joints can also be re-cut and reset in the event that increased closure develops at the site.

A description of risk controls for the railway crossing is provided in the following section.

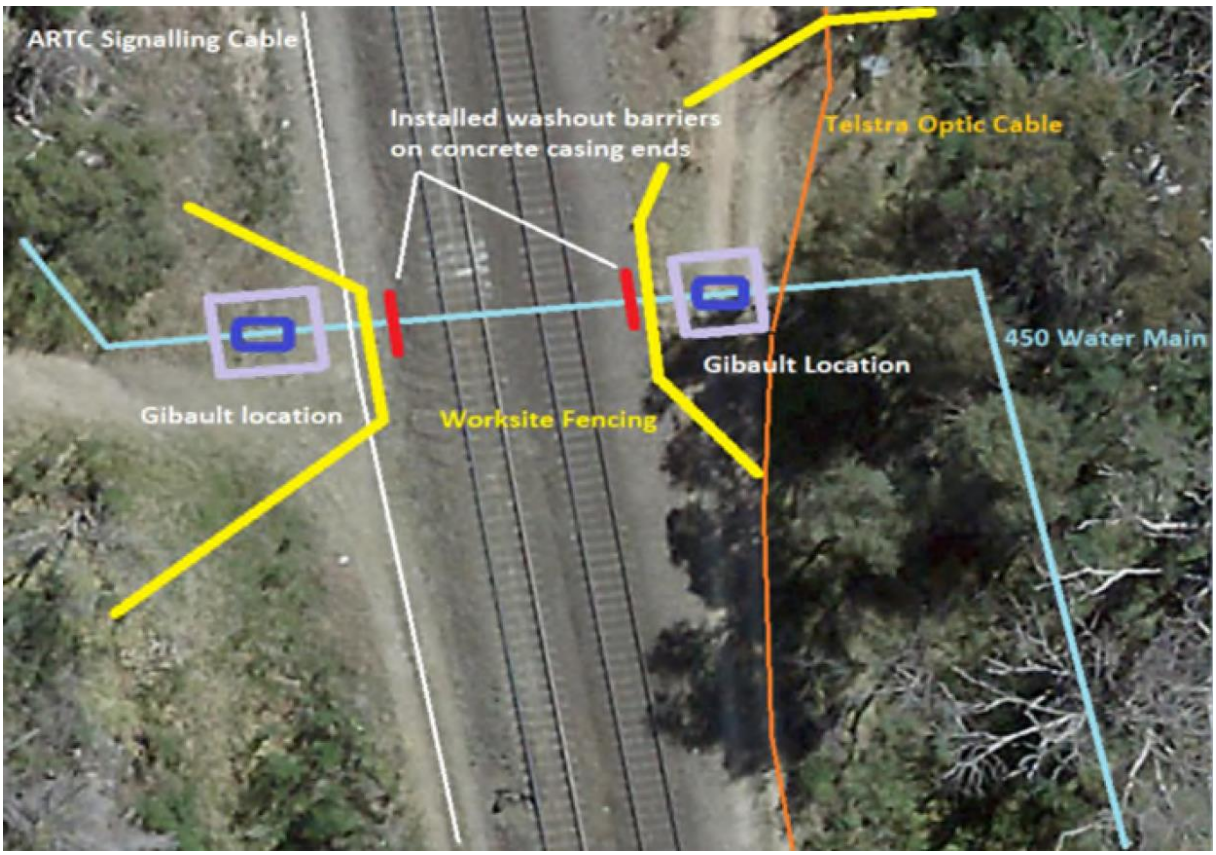
Main Southern Railway crossing at 100.380 km (north of creek crossing at 100.425 km)

The 450 mm diameter CICL water main crosses beneath Main Southern Railway, directly above LW S5A, as shown in Drawing No. MSEC1193-04-01. The crossing consists of direct buried CICL pipe sections with two right angle bends at a cut-fill interface along the Railway near 100.380 km.

Tahmoor Coal, with supervision from Sydney Water, conducted a site investigation of the rail crossing on 14 and 15 September 2024. The aim of the investigation was to:

- Locate the extent of concrete encasement of the water main beneath the track;
- Install a concrete barrier to divert water away from the track, to reduce the potential for washouts in the unlikely event that non-conventional subsidence movement impacts the asset;
- Investigate site conditions and local geology;
- Positively locate all services that cross the pipe crossing in this area using non-destructive techniques; and
- Determine potential locations to fit Gibault expansion joints.

A site map is provided in Figure 5 below.



Map courtesy Tahmoor Coal

Figure 5 Site plan of Railway water main crossing at 100.380 km

The following observations were made:

- The pipe was originally laid in an excavated rock trench;
- Formwork was used to encase the pipe in concrete within the trench;
- The length of encasement supports the railway track with its ends located approximately directly beneath the base of ballast formation – 3.0 m from the Up Main Up Rail (westernmost rail) and 2.8 m from the Down Main Down Rail (easternmost rail);
- Approximately 100 mm of clearance exists between the rock and pipe;
- Locations have been identified on both sides of the crossing that are free of services and concrete encasements, where it would be possible to install Gibault joints in the unlikely event that they are required due to mining-induced ground strains. The excavated trench would need to be widened to install the joints;
- The pipe is 1.2 metres below the surface so shoring is not required to access the pipe;
- The trench has been backfilled with bedding sand.

Photographs of the exposed CICL pipework beyond the ends of the concrete encasement are provided in Figures 6 and 7.

Photographs courtesy Tahmoor Coal

Figure 6 Exposed CICL water main on western side of Railway crossing (Up side)

Photographs courtesy Tahmoor Coal

Figure 7 Exposed CICL water main on eastern side of Railway crossing (Down side)

On 14 and 15 September 2024, Tahmoor Coal in consultation with railway operator ARTC, constructed concrete washout barriers within the ballast formation directly above the ends of the concrete encased pipework. The washout barriers provide protection to the track from washout in the unlikely event of leakage of the water main.

Photographs of the buried concrete washout barriers are provided in Figures 8 and 9.

Photographs courtesy Tahmoor Coal

Figure 8 Concrete bearers placed on concrete bags above pipework and backfilled

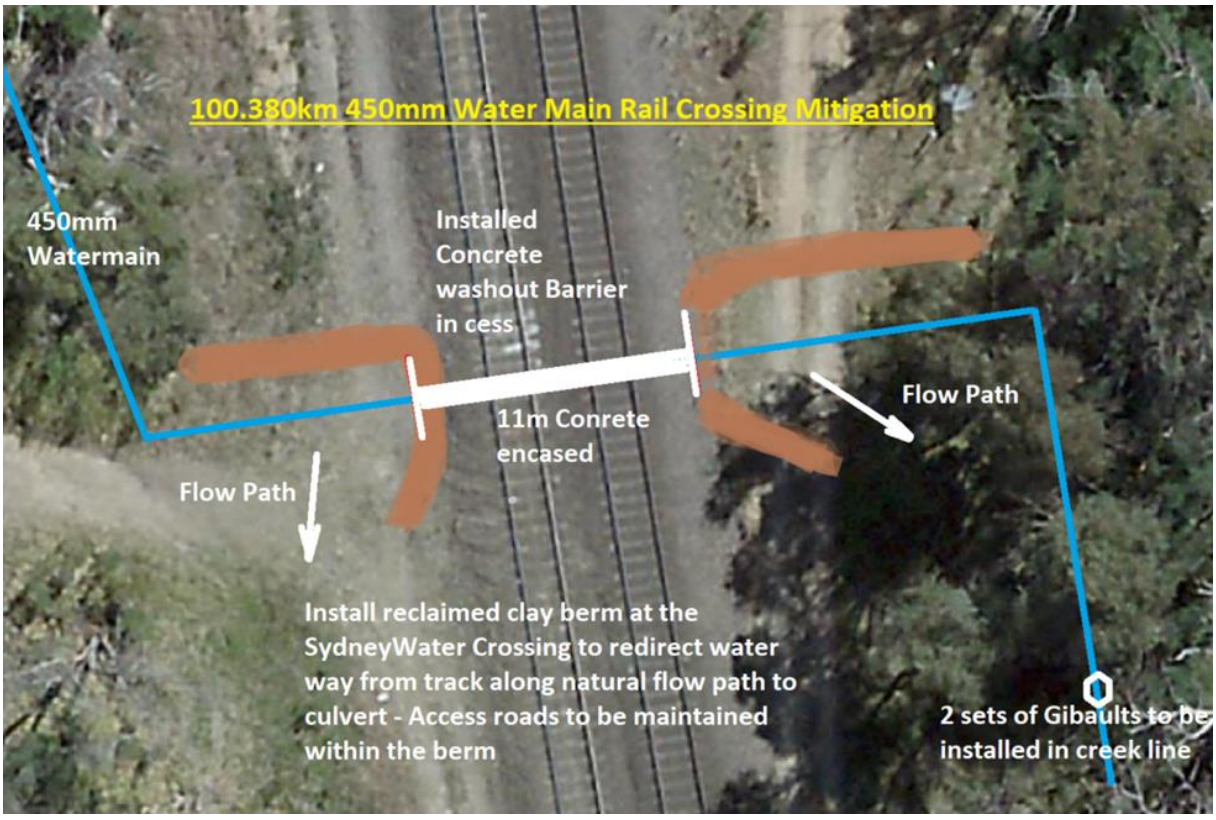
Photographs courtesy Tahmoor Coal

Figure 9 Finished concrete washout barriers in track ballast shoulder

As discussed in the Management Plan, the likelihood of mining-induced impacts at the railway crossing is similar to those along the majority of the water main. There is, however, a chance of impacts to pipe joints that are located at the right angle bends because the bends could act as anchor points in the ground as the pipe sections slide relative to them.

Tahmoor Coal and Sydney Water have agreed to implement the following reasonably practicable risk controls at the railway crossing site due to the mining of LW S4A to S6A, which are in addition to the risk controls for the majority of the water main, as described in the Management Plan.

- Site investigations to confirm as-built construction of the railway crossing;
- Identification of potential location for installing Gibault joints and placement of sand bedding above pipework, if required in future based on actual observations;
- Installation of concrete washout barrier above railway crossing;
- Construction of earth berms to direct water away from railway track, as shown in Figure 10;
- Installation of Gibault joint on north of creek crossing at Creek 3, prior to the influence of LW S5A (subject to confirmation of the LW S5A mine plan). The Gibault joint will reduce the potential for impacts on the right angle bend at the eastern (Down) side of the railway crossing;
- Installation of additional survey marks in local 3D around the crossing; and
- Daily visual inspections of the pipeline crossing by Tahmoor Coal's Rail Maintenance Contractor during periods of active subsidence during the mining of LWs S4A to S6A.



Plan courtesy Tahmoor Coal

Figure 10 Plan of Railway water main crossing at 100.380 km

Review of Risk Assessment by Sydney Water and Tahmoor Coal

The additional controls for the creek, Remembrance Drive and Main Southern Railway crossings were developed following a risk assessment that was conducted on 11 June 2024. The risk assessment was facilitated by Axys Consulting and was attended by representatives from Tahmoor Coal, Sydney Water, Sydney Water's appointed civil engineer Burnett Engineering and Tahmoor Coal's appointed geotechnical engineer Newcastle Geotech, mine subsidence engineer MSEC and monitoring engineer Sweeting Consulting.

On 6 December 2024, Tahmoor Coal and Sydney Water met via teleconference to review Revision A of this Amendment No. 2 (dated 28 November 2024). While the Amendment No. 2 was agreed in principle, it was agreed to formally reassess the risk assessment that was conducted in June 2024.

The risk assessment was revised on 13 December 2024 following the adoption of Option 2 for the Creek 3 and Main Southern Railway crossing.

Update of Risk Control Procedures (Revision B)

The risk control procedures in Table 4.1 have been updated to reflect the selection and installation of risk controls for the creek, road and railway crossings as described in this Amendment.

Proposed Longwall S7A

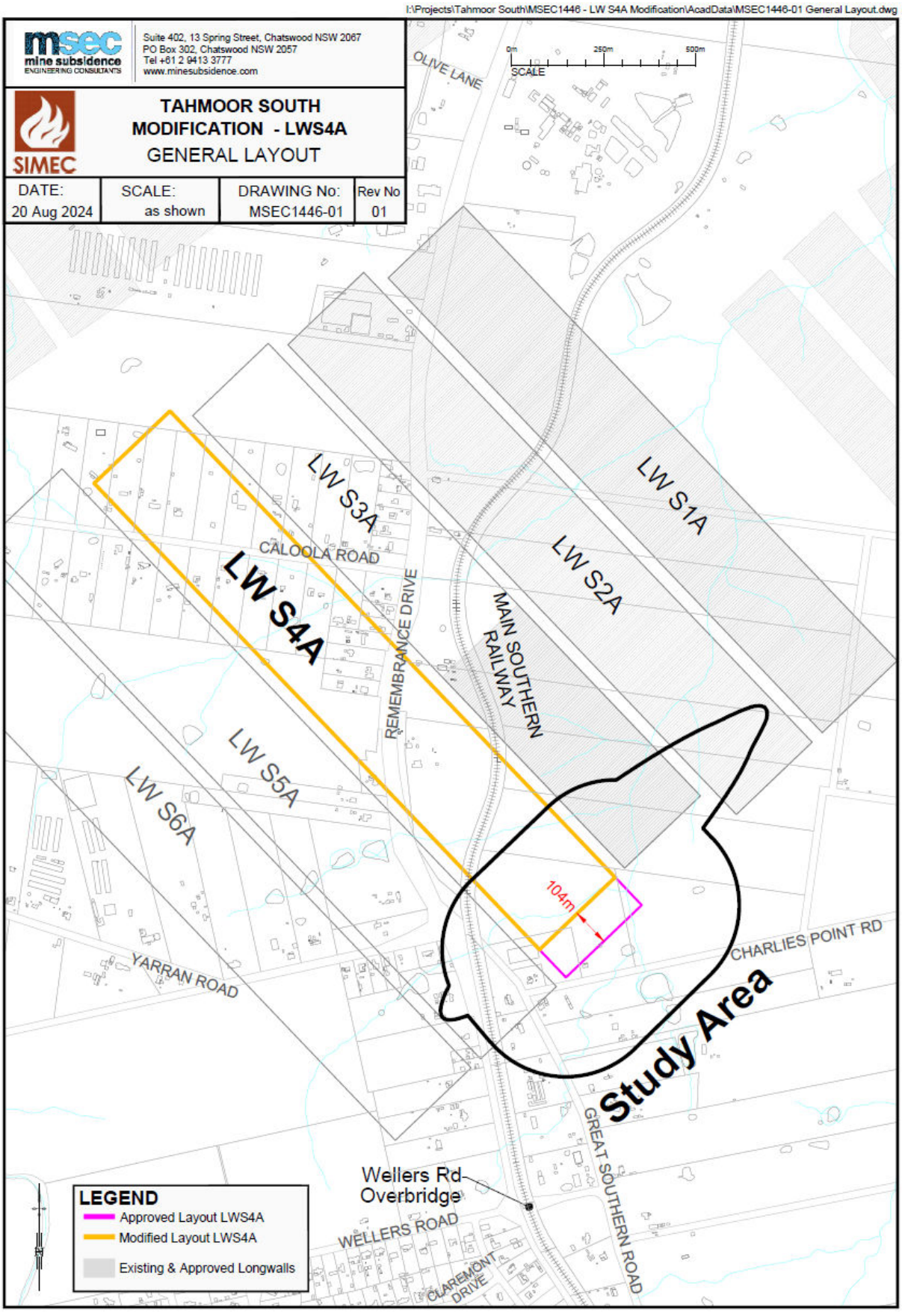
On a separate matter, Tahmoor Coal has submitted a Modification to the development consent to extract LW S7A to the side of LW S6A. The proposed LW S7A will extract directly beneath a section of Yarran Road but result in very minor additional subsidence along Remembrance Drive. Whilst LW S7A has been included in Drawings Nos. MSEC1193-04-01 and MSEC1193-01-01, Tahmoor Coal cannot extract the longwall until the Department of Planning, Housing and Infrastructure approves the proposed modification to Tahmoor Coal's development consent. Tahmoor Coal proposes to seek approval from Sydney Water to amend the Management Plan to include LW S7A at a later time.

Tahmoor Coal welcomes any feedback from Sydney Water regarding the planned changes relating to the shortening of LW S4A. Please note that LW S4A is planned to commence in February 2025.

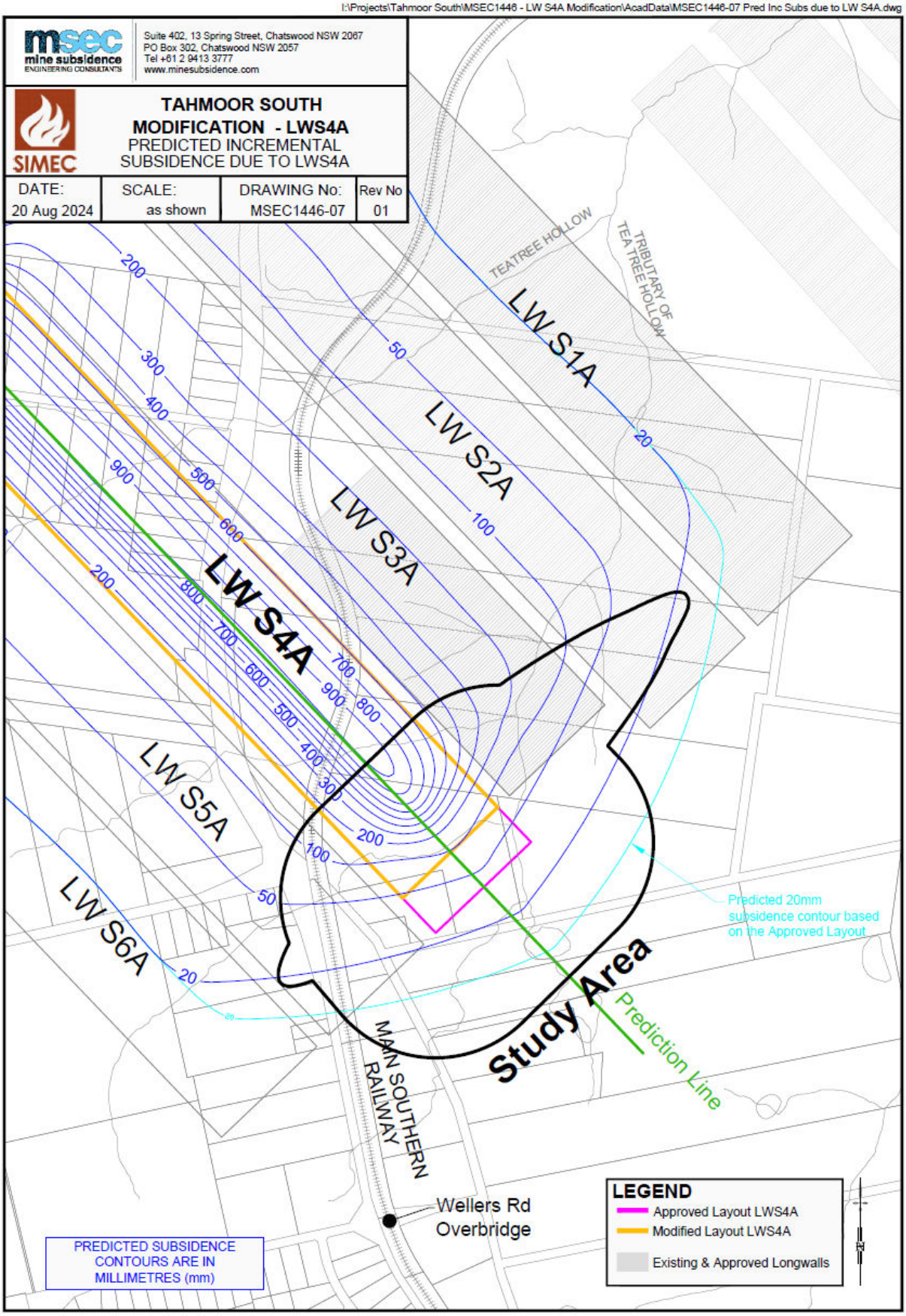
Yours Faithfully

Ross Barber
Project Manager Subsidence
SIMEC Mining

CC Ray Ramage, Principal Subsidence Engineer, Resource Regulator
Encl
Amended Table 4.1 – Risk Control Procedures (Amended for LW S4A)
Drawing No. MSEC1193-01-01, Revision C, 16 October April 2024
Drawing No. MSEC1193-04-01, Revision D, 23 October 2024
Axys (2024b) *SIMEC Mining – Tahmoor Mine – Sydney Water – Water Pipeline – Risk Assessment Report*, Axys Consulting, Report No. AR3883, Revision 2, 13 December 2024.



Drawing No. MSEC1395-01



Drawing No. MSEC1395-07

Revised Table 4.1: Risk Control Procedures LW S1A-S6A (amended for LW S4A in blue)

INFRASTRUCTURE	HAZARD / IMPACT	RISK	TRIGGER	CONTROL PROCEDURE/S	FREQUENCY	BY WHOM?
Potable water infrastructure	Impacts to Sydney Water potable water infrastructure	Low to High	None	Follow Sydney Water procedures to monitor and respond to high water pressure levels at water reducing valves	Ongoing	Sydney Water
				Mark out locations of stop valves on site prior to the influence of each longwalls	Prior to active LW face approaching within 150 metres of each water main within predicted limit of incremental subsidence of each active LW.	Sydney Water
				Arrange for reservoirs within the network to be more than 90% capacity during periods of active subsidence of the 450 mm diameter CICL water main	LW S1A: start after 1300m extraction LW S2A: start after 900m extraction LW S3A: start after 500m extraction LW S4A: start after 200m extraction LW S5A: start after 200m extraction LW S6A: start after 200m extraction	Sydney Water
				Consider and select options and implement additional risk controls at the creek crossing site for the 450 mm diameter CICL water main (most likely to be installation of expansion joints, subject to ongoing investigations) Selected risk controls - Gibault expansion joints installed at Teatree Hollow crossing at intersection of Remembrance Drive and Caloola Road - Gibault expansion joints installed at Tributary to Teatree Hollow crossing north of intersection of Remembrance Drive and Yarran Road (Creek 2) - Install Gibault expansion joints at Tributary to Teatree Hollow crossing adjacent to Main Southern Railway at 100.425 km (Creek 3)	Teatree Hollow crossing at intersection of Remembrance Drive and Caloola Road and Tributary to Teatree Hollow crossing north of intersection of Remembrance Drive and Yarran Road (Creek 2) complete Install Gibault joints at Tributary to Teatree Hollow crossing at Main Southern Railway at 100.425 km (Creek 3) prior to start of LW S5A	Tahmoor Coal and Sydney Water
				Consider and select options and implement additional risk controls at the crossing beneath Remembrance Drive and beneath the Main Southern Railway at 100.380 km (most likely to be installation of valve tees and connection points across the rail crossing, subject to ongoing investigations) Selected risk controls at Remembrance Drive road crossing - Gibault expansion joints installed north of Creek 2, which has reduced the potential for impacts on the right angle bend at the southbound (eastern) side of the crossing Selected risk controls at Main Southern Railway crossing - As-built construction investigated, potential Gibault locations identified, sand bedding placed - Installed concrete washout barrier - Construct earth berm - Install Gibault expansion joint north of creek crossing adjacent to Main Southern Railway at 100.425 km (Creek 3)	~~Prior to start of LW S4A~~ Remembrance Drive crossing completed Main Southern Railway crossing completed except for planned installation of Gibault joint north of Creek 3, which will be completed prior to start of LW S5A	Tahmoor Coal and Sydney Water
				Continuous monitoring of displacements at Gibault joints	Hourly	Tahmoor Coal (SweetingConsulting)
				Continuous GNSS monitoring as shown in Drawing No. MSEC1193-01-01	GNSS units installed Continuous readings, with data averaged over 24 hours and recorded once per day until end of LW S6A.	Tahmoor Coal (Unit Zero)
				2D survey line along Tahmoor Mine property boundary	Pegs installed. Baseline survey prior to commencement of LW S1A. Monthly survey during LW S1A between 200m and 1300m extraction, and continue if ongoing adverse movements are observed. End of LW S1A.	Tahmoor Coal (SMEC)
				Conduct 2D / Absolute 3D surveys along Main Southern Railway in accordance with Railway Management Plan	Monthly 3D / Weekly 2D surveys for pegs within active subsidence zone during LWs S1A to S6A	Tahmoor Coal (SRS)
				Conduct 2D / Absolute 3D surveys along Remembrance Drive	Pegs installed from northern boundary of Tahmoor Mine site to Caloola Road. Baseline survey prior to 900m extraction of LW S1A. Extend line and baseline survey pegs within predicted limit of incremental subsidence of each active LW, prior to active LW face approaching within 600 metres of survey line. Monthly 3D / Weekly 2D surveys for pegs within active subsidence zone commencing as per below: LW S1A: start after 1300m extraction LW S2A: start after 900m extraction LW S3A: start after 500m extraction LW S4A: start after ~~300~~200m extraction LW S5A: start after 200m extraction LW S6A: start after 200m extraction Continue surveys until outside active subsidence zone or one month after end of LW and continue further if ongoing adverse movements are observed. End of LW S1A-S6A.	Tahmoor Coal (SMEC)

INFRASTRUCTURE	HAZARD / IMPACT	RISK	TRIGGER	CONTROL PROCEDURE/S	FREQUENCY	BY WHOM?
Potable water infrastructure	Impacts to Sydney Water potable water infrastructure	Low to High	None	Conduct Local 3D / Absolute 3D survey of Remembrance Drive Embankment over Tributary to Teatree Hollow north of Yarran Road (Creek 2) including water main crossing over Remembrance Drive	Install and baseline survey prior to LW S3A (complete). 3D Survey at end of LW S3A. Monthly 3D / Weekly 2D surveys within active subsidence zone commencing as per below: LW S4A: start after 300m extraction LW S5A: start after 400m extraction LW S6A: start after 400m extraction Continue if ongoing adverse movements are observed. End of LW S4A-S6A.	Tahmoor Coal (SMEC)
				Conduct Local 3D / Absolute 3D survey of Main Southern Railway Embankment over Tributary to Teatree Hollow adjacent to 100.425 km, including water main crossing over Railway	Install and baseline survey prior to LW S3A (complete). 3D Survey at end of LW S3A. Monthly 3D / Weekly 2D surveys within active subsidence zone commencing as per below: LW S4A: start after 200m extraction LW S5A: start after 400m extraction LW S6A: start after 400m extraction Continue if ongoing adverse movements are observed. End of LW S4A-S6A.	Tahmoor Coal (SMEC)
				Conduct 2D surveys along Caloola Road	Pegs installed. Baseline survey prior to 900m extraction of LW S1A.. Survey at end of LW S1A. Weekly 2D surveys for pegs within active subsidence zone commencing as per below: LW S2A: start after 900m extraction LW S3A: start after 800m extraction LW S4A: start after ~~900~~800m extraction LW S5A: start after 900m extraction LW S6A: start after 900m extraction Continue surveys until outside active subsidence zone or one month after end of LW and continue further if ongoing adverse movements are observed. End of LW S2A-S6A.	Tahmoor Coal (SMEC)
				Conduct 2D surveys along Yarran Road	Install and baseline prior to start of LW S3A. Survey at end of LW S3A. Weekly 2D surveys for pegs within active subsidence zone commencing as per below: LW S4A: start after 200m extraction LW S5A: start after 200m extraction LW S6A: start after 200m extraction Continue if ongoing adverse movements are observed. End of LW S4A-S6A.	Tahmoor Coal (SMEC)
				Conduct 2D surveys along Great Southern Road	Install and baseline prior to start of LW S3A. Survey at end of LW S3A. Weekly 2D surveys for pegs within active subsidence zone commencing as per below: LW S4A: start after 200m extraction LW S5A: start after 200m extraction LW S6A: start after 200m extraction Continue if ongoing adverse movements are observed. End of LW S4A-S6A.	Tahmoor Coal (SMEC)
				Conduct Local 3D survey of structure and ground marks on the Main Southern Railway Viaduct over the Bargo River as per Drawing No. MSEC1193-03-02, with one mark on the Viaduct to be surveyed in Absolute 3D.	Install and baseline survey prior to LW S1A. Monthly surveys between 1000m and one month after end of extraction of LWs S1A to S3A and continue if ongoing adverse movements are observed. End of LW S1A-S3A.	Tahmoor Coal (SRS)
				Visual inspections by Track Certifier along Main Southern Railway, including Tributary to Teatree Hollow crossing adjacent to Main Southern Railway at 100.425 km (Creek 3) and Main Southern Railway crossing at 100.380 km	Daily within the active subsidence zone during LWs S4A to S6A and continue if ongoing adverse movements or impacts are observed.	Tahmoor Coal
				Visual inspection of Main Southern Railway Viaduct over the Bargo River	Baseline inspection prior to LW S1A Monthly inspections between 1000m and one month after end of extraction of LWs S1A to S3A and continue if ongoing adverse movements are observed. End of LW S1A to S3A	Tahmoor Coal

INFRASTRUCTURE	HAZARD / IMPACT	RISK	TRIGGER	CONTROL PROCEDURE/S	FREQUENCY	BY WHOM?
Potable water infrastructure	Impacts to Sydney Water potable water infrastructure	Low to High	None	Conduct Local 3D survey of structure and ground marks on the Bargo River Road Bridge over tributary to Bargo River and Bargo River Road Bridge over Main Southern Railway as per Drawing No. MSEC1193-03-03, with one mark on each Bridge to be surveyed in Absolute 3D	Install and baseline survey prior to LW S1A. Monthly surveys between 1000m and one month after end of extraction of LWs S1A to S3A and continue if ongoing adverse movements are observed. End of LW S1A-S3A.	Tahmoor Coal (SRS)
				Visual inspection of Bargo River Road Bridges	Baseline inspection prior to LW S1A Monthly inspections between 1000m and one month after end of extraction of LWs S1A to S3A and continue if ongoing adverse movements are observed. End of LW S1A to S3A	Tahmoor Coal (BIS)
				Detailed visual inspections of local roads, culverts, embankments and cuttings along the routes of the water mains	Weekly for areas within the active subsidence zone during LWs S1A to S6A and continue if ongoing adverse movements or impacts are observed until one month after the extraction of each LW.	Tahmoor Coal ~~(BIS)~~
				Inform Sydney Water Call Centre of mining in area and possible issues.	Completed	Sydney Water
				Notify residents of potential mine subsidence impacts and contact numbers.	Completed	Tahmoor Coal
				Analyse and report results to IMG, including information on the position of the longwall face.	Weekly during LW S1A-S6A after the length of the extraction exceeds 200 metres.	Tahmoor Coal
			Non-conventional ground movement detected	Notify Sydney Water	Within 24 hours	Tahmoor Coal
				Infrastructure Management Group (IMG) meets to consider whether any additional management measures should be undertaken, including: - increasing the frequency of surveys and visual inspections in vicinity of the non-conventional movement; - investigating for potential of damage occurring to Sydney Water infrastructure; and/or - relieving stresses on the pipes by locally excavating and exposing the pipes in the affected area.	As agreed between Tahmoor Coal and Sydney Water	IMG
			Leakage of water observed	Notify all stakeholders, including Sydney Water, Tahmoor Coal, Subsidence Advisory NSW and Resources Regulator	Within 24 hours	Tahmoor Coal
				Repair leak	As per Sydney Water procedures (target within 24 hours for 450 mm dia water main)	Sydney Water
				Provide alternative water supply to customers	As required	Tahmoor Coal
				Consider increasing the frequency of surveys and visual inspections in vicinity of water leak, if appropriate.	As agreed between Tahmoor Coal and Sydney Water	Tahmoor Coal
Potable water infrastructure	Impacts to Sydney Water potable water infrastructure	Low to High	A hazard has been identified that involves potential serious injury or illness to a person or persons on public property or, or in vicinity of potable water infrastructure and cannot be controlled	IMG, Tahmoor Coal and Sydney Water meet to decide whether any additional management measures are required, including: - emergency evacuation of hazardous area - demarcation to prevent people entering hazardous area	Immediately	Tahmoor Coal and Sydney Water
				Notify SRG of trigger exceedance and any management decisions undertaken (incl Subsidence Advisory NSW, Resources Regulator)	Within 24 hours of decision	Tahmoor Coal
			Closure between abutments on Main Southern Rail Viaduct over Bargo River exceeds 7 mm or Closure between GNSS units at ends of Main Southern Rail Viaduct over Bargo River exceeds 7 mm or Closure between abutments Bargo River Road Bridge exceeds 5 mm	Notify Sydney Water	Within one week	MSEC
				Sydney Water and IMG meet and consider whether any additional management measures are required, which may include: - increase monitoring frequency and reporting procedures - install temporary bypass pipeline over creek crossing at Bargo River (Viaduct) or tributary to Bargo River (Bargo River Road Bridge)	Within one week	IMG
				Report trigger exceedance and actions taken to IMG, Sydney Water, SA NSW & MSO in Status Report	Within one week	Tahmoor Coal