



Re-alignment of Gas Main Consent SSD_5093 (Mod 1)

Response to Submissions

September 2015

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1 Introduction

1.1 OVERVIEW

This Response to Submissions Report has been prepared on behalf of UrbanGrowth NSW, the proponent for the Staged Development Application for State Significant Development SSD_5093 (Consent SSD_5093). An application to modify the Consent SSD_5093, under Section 96(2) of the *Environmental Planning and Assessment Act 1979* was lodged in 18 June 2015 and seeks approval to modify the alignment of the approved gas main relocation.

This report provides a response to each of the issues raised by government agencies, utility and public submissions with the provision of additional justification and technical information where relevant.

An amendment to the proposed alignment of the gas main is proposed in response to issues raised by Ausgrid related to the potential impact of the proposed gas main on existing 132,000v cables in the Wicks Road reserve.

1.2 BACKGROUND

An existing gas main is aligned across the northern end of the Lachlan's Line site approximately on an alignment parallel to Waterloo Road. It exits in the Lachlan's Line site on the northern side of the existing access road and extends westwards along the northern side of Waterloo Road. It is understood that the gas main was relocated to its present location within an unmade road reserve as part of the M2 roadworks. This road reserve was apparently closed in 2001/2 however the gas main was not relocated at that time. The gas main is being relocated because it would be aligned through an approved development lot on the Lachlan's Line site and would significantly reduce the development potential of this land.

1.3 EXHIBITION AND SUBMISSIONS

The DPE website confirms that the public exhibition of the application concluded on 30 July 2015 with submissions made publically available.

A total of 9 submissions were received from members of the public, government agencies and utility providers.

The public and stakeholder submissions were made available to the proponent on the DPE website following the conclusion of the public exhibition period. The issues raised in the submissions have been assessed with a response provided in Section 2 of this report.

1.4 PURPOSE OF THIS REPORT

The report is structured as follows:

- Section 2: A response to key issues raised in submissions.
- Section 3: A description of the amended proposal.
- Section 4: Conclusion

2 Response to Submissions

2.1 OVERVIEW

A total of 9 submissions were received during the public exhibition of the application to modify Consent SSDA_5093. Seven (7) of the submissions were received from the following government agencies and utility service providers:

- Ausgrid
- NSW Heritage Council
- Roads and Maritime Services
- NSW EPA
- Department of Primary Industries
- Sydney Water Corporation
- Jemena

The NSW Office of Environment and Heritage and Transport for NSW provided responses to the Department of Planning and Environment (DPE) advising that they did not intend to provide submissions on the modification application.

Two submissions were received from the following members of the public and community groups:

- John McCain and Diane Michel
- Hunters Hill Flora and Fauna Preservation Society

2.2 AUSGRID

TABLE 1 – RESPONSE TO AUSGRID SUBMISSION

AUSGRID	
Issue raised	Response
<p>Ausgrid have identified potential impacts or interfaces with exiting two 132,000 volt cables that in the vicinity of the proposed gas main.</p> <p>Ausgrid advise that it will provide consent to the development provided that the following conditions are met by the Proponent:</p> <ul style="list-style-type: none">i. Confirmation of the location and status of existing Ausgrid infrastructure;ii. Confirmation of any infrastructure which requires relocation;iii. Provision of a design taking into consideration electric and magnetic fields (EMF), stray currents associated with Ausgrid's	<p>Potholing, service scanning, survey and Dial-Before-You-Dig (DBYD) information have confirmed the presence of the existing Ausgrid cables within the Wicks Road reserve.</p> <p>UGNSW has considered the potential impact of the proposed alignment of the gas main within the Wicks Road reserve on existing Ausgrid infrastructure.</p> <p>An amended plan (Drawing number C-0-9-20 "Plan of Proposed New Route of Gas Main to Accompany an Application by UNSW to Amend Consent SSD_5093") showing the relocated gas main is provided to replace the Plan submitted with the modification application. The amended plan proposes to maintain the alignment of the approved gas main along Wicks Road frontage as</p>

infrastructure;	approved in Consent SSD_5093.
iv. Agreement on appropriate work methodologies and risk mitigation actions for works in the vicinity of Ausgrid's infrastructure; and	Maintaining the approved alignment of the gas main within the boundary of the site, along the Wicks Road frontage will avoid any additional impact on existing utilities and services within the Wicks Road reserve. The conditions suggested by Ausgrid are therefore considered unnecessary.
v. Provision of evidence supporting the development has no impact to the safe operation and maintenance of Ausgrid's infrastructure.	

2.3 NSW HERITAGE COUNCIL

TABLE 2 – RESPONSE TO NSW HERITAGE COUNCIL SUBMISSION

NSW HERITAGE COUNCIL	
Issue raised	Response
<p>The NSW Heritage Council recommends for inclusion in the Director's General's Requirements:</p> <p>1. <i>If substantial intact archaeological deposits and/or State significant relics are discovered, work must cease in the affected area(s) and the Heritage Council of NSW must be notified. Additional assessment and approval under the Heritage Act 1977 may be required prior to works continuing in the affected area(s) based on the nature of the discovery.</i></p>	<p>The report titled Archaeological Assessment, Excavation and Monitoring Methodology prepared by Artefact, dated May 2014 that accompanied the Environmental Impact Statement for SSD_5093 found that the study area has low potential to contain non-Indigenous archaeological remains other than those of the cistern/well that were identified and re-buried in 2002.</p> <p>The Artefact report also found that the area has been severely disturbed through its earlier use as a stockpile and compound site, and during the construction of the M2 Motorway. No recorded Aboriginal sites were identified within the study area, and the Lachlan's Line site has low Aboriginal archaeological significance.</p> <p>It is considered that Conditions C16 and C17 provides requirements for below ground (sub-surface) works – Non-aboriginal relics and C18 Discovery of aboriginal heritage provide a similar intent as the recommended inclusion in the Director General's Requirements from the NSW Heritage Council.</p> <p>Were contractors to discover aboriginal or non-aboriginal, they are bound by the Heritage Act 1977 to undertake further assessment and approval prior to continuing works.</p> <p>It is considered that the conditions of Consent SSD_5093 provide sufficient measures to mitigate impacts on archaeological or relics if found within the alignment of the relocated gas main.</p>
NSW Heritage Council identifies that the HIS prepared by Urbis concludes that the existing trees along the eastern	The Heritage Impact Statement prepared by Urbis and accompanying the Environmental Impact Statement for

boundary of the site provides a visual buffer between the subject site and the Northern Suburbs Cemetery.

NSW Heritage Council state that it is unclear how excavation for the construction of the gas main may effect and that if the gas main will remove trees, a HIS is required to assessment the potential visual impact on the Northern Suburbs Cemetery. If adverse impacts are caused, the NSW Heritage Council measures to minimise and mitigate impacts should be included.

SSD_5093 concludes that:

“The works on the M2 Site are opposite the Cemetery. The western boundary of the Cemetery is lined with trees that provide a buffer zone to the highway and aesthetic setting for the Cemetery. The two sites are separated by the M2 Motorway, which varies in height from north to south as it passes under the Delhi Road bridge.

There are significant vistas within the Cemetery and to the surrounding area. Formal plantings within the Cemetery provide an internal aesthetic setting and landscape buffer to surrounding development. The historical context of the Cemetery has altered within its urban environment with the construction of the M2 Motorway and construction of the North Ryde Railway Station”

The assessment of the impact of SSD_5093 on the Cemetery found that the proposed development would have acceptable impacts. The formal plantings within the cemetery provide an internal aesthetic setting and landscaped buffer to the surrounding development.

Notwithstanding the above comment, the gas main is to be located within a 3 metre wide easement within the M2 Corridor land in the location shown on the Plan at Appendix A. Tree removal is to be limited to a 5 metre corridor along the alignment of the gas main. Trees outside the 5m corridor are to be retained except where there removal is approved in consent SSD5093.

Moreover, disturbed areas will be rehabilitated following the relocation of the gas main, in accordance with the recommendations of the Flora and Fauna Assessment prepared by ELA dated June 2015, including:

- Removal of any remaining noxious weeds (using cut and paint)
- Tilling of soil surface if the soil has been compacted during works
- Installation of erosion control structures such as jute matting and coir logs etc.
- Planting of local provenance species are to be conducted following site preparation and include species present within the UGNSW land adjacent and those consistent with Sandstone Ridgetop Woodland.

2.4 ROADS AND MARITIME AUTHORITY

TABLE 3 – RESPONSE TO RMS SUBMISSION

ROADS AND MARITIME AUTHORITY (RMS)	
Issue raised	Response
RMS submission dated 12 August 2015 recommends the following conditions to be included in a consent:	
1. The proponent is required to following the M2 Motorway access protocol including relevant inductions.	Access to the M2 Motorway Lands is to be by agreement between the RMS and UrbanGrowth NSW. It is not appropriate planning administration to require such access arrangements to be the subject of consent conditions. UGNSW requests this recommended condition be excluded from the modified consent.
2. The proponent is to provide evidence and surety that the gas main relocation works (specifically excavations) will have no impact on the M2 Motorway carriageway and supporting embankment in the area.	<p>UGNSW commissioned JK Geotechnics Geotechnical and Environmental Engineers to obtain information on the subsurface conditions in the vicinity of the proposed relocated gas main, and to provide advice on the risks to the existing M2 carriageway and embankment, and recommendations for managing these risks.</p> <p>The assessment provided at Appendix B provides the evidence that demonstrates the proposed construction of the gas main will not have a significant impact on the stability of the supporting embankment, subject to excavation being undertaken in accordance recommendations contained within the assessment report.</p> <p>As the expert geotechnical assessment has found that the impacts on the M2 carriageway and stability of the embankment will be acceptable with the adoption of mitigation measures during excavation the recommended condition by the RMS is unnecessary. UGNSW requests this recommended condition be excluded from the modified consent.</p>
3. The area available to the proponent will be limited to a 3 metre corridor offset from the M2 Motorway land boundary and following the land boundary.	An area that is 3m in width and offset from the M2 Motorway boundary is acceptable to UGNSW to accommodate the relocated gas main.
4. The proponent is required to enter terms acceptable to Roads and Maritime for an easement over the 3 metre corridor referred to above, prior to the Construction Certificate.	An easement over the 3m corridor is to be established on the M2 Corridor Land. A consent is not an appropriate planning administration approach to make the satisfactory terms of the easement a pre-condition on a construction certificate for the works, as the easement relates to the on-going management and access rights to the gas main.

	UGNSW requests this recommended condition be excluded from the modified consent.
5. The proponent is required to submit a survey and ratify to The Hills Motorway Limited's satisfaction prior to the commencement of work that the M2 Motorway land boundary butting the development site is true and correct.	<p>The boundary of the M2 Motorway Land is a registered land title and is therefore true and correct. A site survey including the boundary of the M2 Motorway Lands has been prepared for Consent SSD_5093.</p> <p>UGNSW requests this recommended condition be excluded from the modified consent.</p>
6. A Construction Traffic Management Plan detailing construction vehicle routes, number of trucks, hours of operation, access arrangements and traffic control are to be submitted to Roads and Maritime and The Hills Motorway Limited's for review and approval prior to the issue of a Construction Certificate.	<p>Condition B5 of Consent SSD_5093 requires a Construction Traffic Management Plan, approved by the Certifying Authority, to be in place in respect of all approved development. This condition requires consultation with, but not approval from, RMS and Transport for NSW. It is submitted that:</p> <ul style="list-style-type: none"> • this is the appropriate mechanism for management of construction traffic risks relating to the relocation of the pipeline and all other development approved under Consent SSD 5093; and • there is no aspect of the amended pipeline relocation route which is cause for amending the operation of Condition B5. <p>For this reason it is submitted that the condition requested in this submission should not be imposed in any approval of the S96 Application.</p>
RMS had the following further comments for the Department; consideration in determining the application:	
1. The wording of Condition of Consent C23 should be modified to include wording to ensure that the site is rehabilitated in accordance with the relevant M2 Landscape Management Plan.	The Applicant invites a condition to be included in the modified Consent SSD_5093 that adopts the recommendations of the Flora and Fauna Assessment prepared by ELA, which provide a comprehensive list of recommendations for the rehabilitation of the M2 Corridor Lands.
2. The Department of Planning and Environment should be satisfied that the proponent has addressed potential impacts on heritage, including Aboriginal cultural heritage, and has addressed any construction noise and vibration impacts.	<p>Aboriginal and non-aboriginal heritage assessments were undertaken with the Environmental Impact Statement for Consent SSD_5093.</p> <p>Construction noise and vibration impacts associated with the construction of the gas main will be managed in accordance with a Construction Environmental Management Plan prepared prior to the commencement of works.</p>

2.4.1 NSW EPA

TABLE 4 – RESPONSE TO NSW EPA SUBMISSION

NSW EPA	
Issue raised	Response
<p>1. EPA Regulation</p> <p>The NSW EPA recommends that UGNSW undertake a review of all activities associated with the development and determine whether licensing under the POEO Act is required.</p>	<p>None of the activities undertaken on the premises will be the subject of a licence under the POEO Act.</p>
<p>2. Construction Environmental Management Plan (CEMP)</p> <p>The EPA recommends that the CEMP required by Condition B3 of SSD_5093 be reviewed to ensure the plan and any proposed mitigation measures are adequate to address the proposed gas main realignment, and identifies a range of matters that are to be included, as follows:</p> <ul style="list-style-type: none">• Soil and water management• Dust and odour emissions• Potential noise impacts• Potential land contamination• Construction waste management• Spill management	<p>Condition B3 of SSD_5093 is sufficient in its current form to cover those matters listed in the NSW EPA submission for the new alignment of the gas main.</p>

2.4.2 DEPARTMENT OF PRIMARY INDUSTRIES

TABLE 5 – RESPONSE TO DEPARTMENT OF PRIMARY INDUSTRIES DRAFT SUBMISSION

DEPARTMENT OF PRIMARY INDUSTRIES	
Issue raised	Response
The DPI Water seeks clarification from UGNSW if the proposed gas main alignment will cross Porters Creek and disturb the riparian corridor.	<p>The approved alignment for the gas main relocation involved the crossing of Porters Creek and the riparian corridor south west of, that is upstream of, the existing concrete headwall. The approved alignment includes the construction of a temporary bund wall across the creek and a trench excavated in the creek bed.</p> <p>The gas main crossing of the Porters Creek culvert in this modification application is proposed to occur in a concrete encasement on top of the underground concrete pipe into which Porters Creek flows which is downstream of the culvert headwall.</p> <p>The new alignment will avoid the need to excavate the trench crossing the creek bed and undertake creek bank stabilisation. For this reason the new alignment is considered an improvement when compared to the approved alignment for the ecological condition of the riparian corridor.</p>

2.4.3 SYDNEY WATER CORPORATION

TABLE 6 – RESPONSE TO SYDNEY WATER CORPORATION SUBMISSION

SYDNEY WATER	
Issue raised	Response
Sydney Water provided a submission to the NSW Department of Planning & Environment on 30 July 2015. Comments related to, the following:	
Location of relocate pipe in relation to the Sydney Water assets	
<p>The proponent is to ensure that the location of the relocated gas pipe does not adversely affect the operation of any Sydney Water assets.</p> <p>This is to be completed before construction works commences, and is a condition of obtaining a Section 73 Certificate from Sydney Water.</p>	<p>The proposed realignment of the gas main has considered the location of Sydney Water assets. No adverse impacts are expected as a result of the construction or operation of the Jemena gas main.</p> <p>Noted.</p>
Water and Wastewater	
Refers to previous comments ion SSD_5093, dated 11 August 2014, which remains relevant and notes that the conditions are to be assessed as part of the Section 73 application process.	Noted.

2.4.4 JEMENA

TABLE 7 – RESPONSE TO JEMENA SUBMISSION

JEMENA	
Issue raised	Response
<p>Jemena have no objection to the proposed new alignment of the Gas Main.</p> <p>Jemena advise that it will be the responsibility of UrbanGrowth NSW or their nominated contractor to obtain all approvals (ie, Authority / Environmental) and install/maintain all environmental controls associated with the gas relocation works. Urban Growth NSW or their nominated contractor will also be responsible for the permanent restorations associated with the gas relocation works.</p> <p>The submission states that on completion of the works Urban Growth NSW will be responsible to gain consents from the land owner to grant Jemena an easement over part of the M2 property.</p> <p>Jemena note that the easement will need to be rehabilitated with suitable low growing grass species that are to be used to aid with sediment/erosion control and to allow the asset to be regularly monitored.</p>	<p>We note that Jemena do not raise any objection to the new alignment of the gas main.</p> <p>Environmental controls associated with the gas main relocation works are to be implemented by UGNSW, in accordance with the CEMP required under Condition B3 and the recommendations in the Flora and Fauna Assessment Report at Appendix A.</p> <p>As noted above an easement is to be established over the 3 metre wide corridor on the M2 Corridor Lands with the consent of the RMS, upon the completion of the works.</p>

2.5 PUBLIC AND COMMUNITY GROUP SUBMISSIONS

The public and community group submissions have been reviewed and assessed. **Table 12** provides a detailed response to these issues.

TABLE 8 – RESPONSE TO SUBMISSIONS: PUBLIC, COMMUNITY GROUP AND ORGANISATION SUBMISSIONS

ISSUE	RESPONSE
John McCain and Diane Michel	
<ul style="list-style-type: none"> Seeking clarification on the precise location and alignment of the proposed gas main in relation to the culvert in the M2 Corridor. 	The location of the proposed gas main is shown on the Plan at Appendix A . The gas main will be located within a 1.2 metre deep trench approximately at the centre of a 3 metre width corridor offset from the M2 Motorway Corridor Lands boundary.
<ul style="list-style-type: none"> Confirmation sought on the on-going management of the corridor. 	The M2 Motorway Corridor Lands is managed by the motorway operator, under the terms of a lease from the RMS. UGNSW will be responsible for the rehabilitation of the gas main corridor, in accordance with the recommendations of the Flora and Fauna Assessment prepared by ELA, consistent with the condition of consent invited in this modification application. Responsibility for on-going management of the M2 Corridor Lands rests with the motorway operator.
<ul style="list-style-type: none"> Confirmation who the gas main will service, residents of the M2 site or other destinations. 	<p>Jemena owns, operates, and maintains a high pressure gas main within the development. The gas main provides natural gas to more than 39,000 customers throughout Sydney's Northern Region.</p> <p>This gas main is not critical to the gas supply of the site and gas services are to be augmented for the specific needs of the Lachlan's Line development.</p>
<ul style="list-style-type: none"> Question whether fire-related vegetation clearance has been considered. 	The Lachlan's Line site and that part of the M2 Corridor lands to which this application relates is not classified as bushfire prone land. No bushfire related land clearance is required for the proposed Jemena asset. Vegetation clearance is to be limited to the 5m width corridor along the M2 Motorway Corridor Lands assessed by ELA.
<ul style="list-style-type: none"> Seeking confirmation as to whether the proposed gas main relocation is related to the gas main that is located partly in Bundara Reserve and whether it will have any adverse impact on the reserve. 	The existing high pressure natural gas main runs through the M2 site, and enters the site at the access road at Wicks Road and runs through the bushland to the M2, whereby it parallels the M2 within the M2 corridor lands. This alignment was confirmed on the Dial before You Dig plans and through liaison with Jemena.
Ryde – Hunter's Hill Flora and Fauna Preservation Society	
The Ryde – Hunter's Hill Flora and Fauna Preservation Society identify concerns with the potential impact associated with the gas main	As described above the location of the proposed gas main is approximately at the centre of a 3 metre width corridor offset from the M2 Motorway Corridor Lands boundary.

ISSUE	RESPONSE
<p>relocation, as follows:</p> <ul style="list-style-type: none"> ▪ Clarification sought on the proposed alignment of the gas main relative to the existing culvert in the M2 Corridor land. ▪ Clarity is sought as to how the gas main fits into the exiting gas infrastructure network; ▪ Clarification on the remediation of the relocated gas main, to assist habitat connectivity and the responsible party for those works. ▪ Concerns with the amenity of bushland reserve and the boardwalk 	<p>The gas main crossing of the Porters Creek culvert is proposed to occur in a concrete encasement on top of the existing headwall outlet. This is considered an improved location for the crossing when compared to the approved alignment located south west of the headwall outlet.</p> <p>As noted above in response to the submission from John McCain and Diane Michel the gas main provides natural gas to more than 39,000 customers throughout Sydney's Northern Region.</p> <p>Rehabilitation of the relocated gas main will be the responsibility of UGNSW with works undertaken in accordance with the Flora and Fauna Assessment prepared by ELA dated June 2015.</p> <p>Rehabilitation of the Northern Bushland Reserve and the M2 Motorway Corridor Lands to be cleared for the gas main will include the removal of weeds and exotic species of vegetation, which currently detract from the amenity of these areas. The program of rehabilitation works will see an improvement to the amenity of these areas.</p>

3 The Proposal

3.1 DESCRIPTION OF WORKS

The realignment works involved are:-

- Install protective measures for the trees to be retained;
- Install sediment and erosion controls along the proposed gas main route;
- Clear a 5m wide path along northern boundary within the Northern Bushland Reserve (as approved) and in the M2 Motorway Corridor Lands as shown on the Plan at **Appendix A**);
- Progressively excavate a trench and lay the 150mm diameter gas main at a depth of 1.0m to 1.2m deep along the relocated gas main route;
- Dispose of excess spoil;
- Place selected fill over the pipeline and then replace excavated soil to fill the trench;
- Stabilise the excavated area with vegetation and sediment and erosion control measures;
- At Porters Creek, construct a concrete encasement for the gas main on top of the existing headwall outlet; and
- Rehabilitate the 5m wide path in accordance with the recommendations of the Flora and Fauna Assessment prepared by ELA dated June 2015 and the relevant M2 Motorway Landscape Management Plan (RMS).

The existing gas main would be removed once the relocated gas main has been connected to the existing main. The methodology of removal would be essentially the same as the installation of the relocated main except the main would be removed from the trench.

The Flora and Fauna Assessment by ELA proposed a range of mitigation measures to ensure that the works will not have a significant adverse impact on the ecological features of the site.

3.1.1 TREE REMOVAL AND REHABILITATION

The following condition of consents is invited to be inserted in Part C of the SSD_5093 Consent that will permit tree removal within a 5m wide corridor for the construction of the relocated gas main and will require UGNSW to implement the recommended measures to rehabilitate disturbed areas from the Flora and Fauna Assessment:

TREE REMOVAL

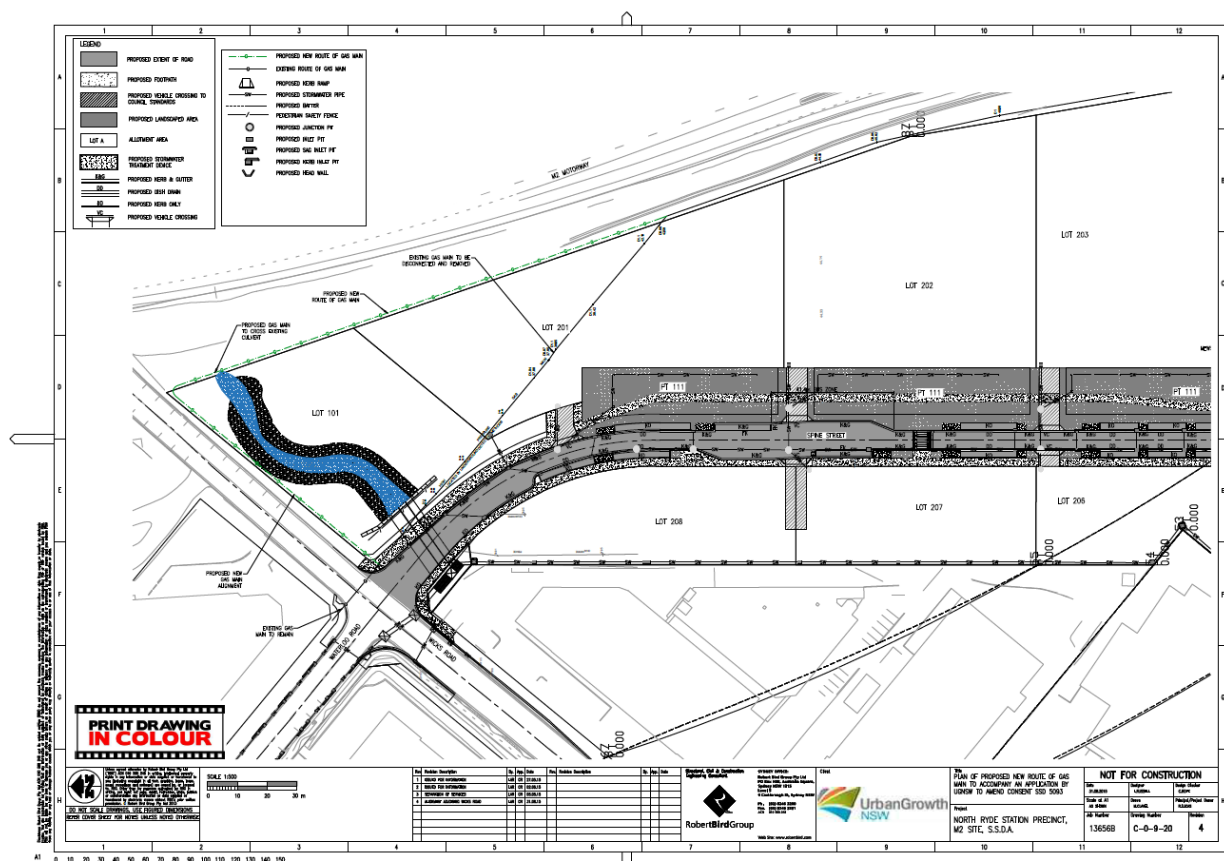
C23. A 5m wide path is to be cleared of trees along northern boundary of the Site within the Northern Bushland Reserve adjacent Wicks Road and in the M2 Motorway Corridor Lands generally in the location shown on the Plan of proposed new route of gas main to accompany an application by UGNSW to amend consent SSD_5093 (Ref: Drawing No. 13656B C-0-9-20 Rev. 4) and prepared by Robert Bird Group.

REHABILITATION OF DISTURBED AREAS FOR GAS PIPELINE ON M2 MOTORWAY CORRIDOR LANDS

C24. Rehabilitation of the M2 Motorway Corridor Lands disturbed by works associated with the relocation of the gas pipeline is to be carried out in accordance with the recommendations of the Flora and Fauna Assessment prepared by Eco Logical Australia Pty Ltd dated June 2015.

The response to the submissions and provision of additional information has resulted in an amendment to the proposed development, as shown in **Figure 1**. The new alignment of the gas main proposes to retain the approved alignment within the Lachlan's Line site along the Wicks Road frontage.

“Plan of proposed new route of gas main to accompany an application by UGNSW to amend consent SSD_5093” (Ref: Drawing No. 13656B C-0-9-20 Rev. 4) prepared by Robert Bird Group



4 Conclusion

This Response to Submissions Report has been prepared in respect of the submissions received during the public exhibition period in relation to a modification application in relation to Consent SSD_5093.

The amended location of the gas main presented at **Appendix A** is considered to be substantially the same development as was approved under Consent SSD_5093.

The gas main relocation works proposed within the M2 Motorway Corridor Lands in this application are 'State Significant Development', under Clause 8(2) of the SRD SEPP, and is consistent with the underlying intent of the land use zone for the land.

The works will see the removal of vegetation to construct a trench for the gas pipeline. Direct and indirect environmental impacts have been considered by ELA and found to be minimal and manageable. No impacts are expected on any threatened or endangered ecological communities or species. Mitigation measures are to be employed through the implementation of a Construction Environmental Management Plan to minimise sedimentation and erosion of the land during excavation and construction works. A condition of consent is invited to be included in Part C of the SSD_5093 Consent, requiring the ELA recommendations to rehabilitate the M2 Motorway Corridor Lands following the gas main relocation.

As demonstrated within this report and the modification application, the modified consent is considered to be acceptable under the relevant considerations of Section 79C of the EP&A Act, and as such it is recommended that approval be granted to the proposal as modified, subject to the conditions invited in this report.

Disclaimer

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This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

Appendix A

Modified General Arrangement Plan titled, “Plan of proposed new route of gas main to accompany an application by UGNSW to amend consent SSD_5093” (Ref: Drawing No. 13656B C-0-9-20 Rev. 4) and prepared by Robert Bird Group

Appendix B

Geotechnical Assessment prepared by JK Geotechnics

10 September 2015
Ref No 27484P6let

UrbanGrowth NSW
C/- National Project Consultants Pty Ltd
PO Box 1060
CROWS NEST NSW 2065

ATTENTION: Mr Craig Kelly

Dear Sir

GEOTECHNICAL ASSESSMENT
PROPOSED GAS MAIN RELOCATION
LACHLANS LINE, ADJACENT TO M2 MOTORWAY, MACQUARIE PARK

At your request, we have undertaken an assessment of the likely effect of relocating an existing gas main running through the Lachlans Line site to a new alignment running through the M2 Motorway corridor, which runs along the eastern side of the site. The proposed alignment is shown on the drawing prepared by Robert Bird Group, Job Number 13656B, Drawing Number C-0-9-20 Revision 4. We understand the construction of the gas main will involve the excavation of a trench approximately 1.2m deep and 0.45m wide, the installation of the new gas main, and the backfilling of the trench with engineered fill.

The purpose of the assessment was to obtain information on the subsurface conditions in the vicinity of the proposed relocated gas main, and to provide advice on the risks to the existing M2 carriageway and embankment, and recommendations for managing these risks.

The assessment was completed in accordance with our quotation by email dated 21 August 2015, and the request to proceed by email from Mr Craig Kelly dated 1 September 2015.

Assessment Procedure

Prior to our attendance on site, four test pits were excavated just inside the Lachlans Line site boundary by the earthworks contractor working on the Lachlans Line site, to depths ranging between 0.5m and 1.5m below the existing surface levels. These test pits were then logged by an experienced geotechnician from Soil Test Services (STS), the earthworks testing division of the Jeffery and Katauskas Group, with a later visit by a geotechnical engineer of JK Geotechnics to create cross sections through each test pit extending partway up the M2 motorway embankment.



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This information was then used by a Senior Associate level geotechnical engineer to assess the likelihood of the proposed work impacting upon the M2 embankment and carriageway, and to provide the following recommendations to manage these risks.

Results of the Investigation

Site Description

The site is located on a gentle north-west facing hillside, close to the toe of an embankment which was constructed to support the M2 motorway. In the vicinity of the proposed gas main relocation the slopes on the nearside of the motorway embankment range between about 45° and 50°. Approximately 1m from the toe of the motorway embankment is a concrete lined dish drain which has a width between 1.5m and 2.0m and a depth of between 0.3m and 0.4m. The embankment and surface below the toe of the embankment is vegetated.

The conditions exposed in the test pits generally comprise topsoil over residual sandy clay and silty clay which in turn overlies sandstone bedrock. The topsoil encountered in the test pits comprised silty sand topsoil extend to depths ranging between about 0.2m toward the southern end of the proposed gas main area to about 0.4m at the northern end. Below the topsoil was orange brown and light grey residual sandy clay and silty clay. The sandstone bedrock within the test pits over about the southern three-quarters of the site was encountered at depths of between 0.5m and 0.6m, and deepened to in excess of 1.5m toward the northern end of the site, closer to Porters Creek. No groundwater seepage into the test pits was noted.

COMMENTS AND RECOMMENDATIONS

We understand the proposed construction will involve the excavation of a trench not exceeding 1.2m deep and this will be predominantly through reasonably competent residual clayey soils and sandstone bedrock. The excavation of the soils should be readily achieved using bucket attachments to tracked excavators, though excavation of the sandstone is likely to require the use of either rock breaker attachments or grinder attachments to tracked excavators for effective trench excavation. Provided personnel do not need to enter this trench, the dark grey topsoil material at the surface should be nominally battered at slopes of about 1 Vertical in 1 Horizontal (1V in 1H), while the residual sandy clay and silty clay could be cut vertically. Excavations in the sandstone bedrock may also be cut vertically. If personnel are required to enter a trench of greater than 0.8m depth the soils should be battered at no greater than 1V in 1H, though the sandstone may be cut vertically subject to geotechnical inspection prior to personnel entering the trench.



The soils encountered in the test pits are reasonably competent, and we do not consider the excavation of the trench will have any noticeable impact in the short term on either the M2 carriageway or embankment, provided the line of the trench is offset from the toe of the embankment a distance at least equal to the lesser of the depth of the trench or thickness of the soil within the trench. In making this assessment we have assumed that the trench would be excavated and backfilled within a period not exceeding two weeks. The site foreman should inspect the area of the trench on a daily basis, and if there are any tension cracks observed on either side of the trench, we should be contacted immediately to assess these cracks and whether any urgent action needs to be taken to prevent any instability of the embankment.

To prevent any long-term effects on the M2 carriageway or embankment, the backfill to the trench should be placed in thin layers and compacted to a density of not less than 95% of Standard Maximum Dry Density (SMDD), with in situ density testing completed within this fill at a frequency meeting at least the minimum requirements of AS3798-2007.

GENERAL COMMENTS

The recommendations presented in this report include specific issues to be addressed during the construction phase of the project. In the event that any of the construction phase recommendations presented in this report are not implemented, the general recommendations may become inapplicable and JK Geotechnics accept no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full and properly tested, inspected and documented.

Occasionally, the subsurface conditions between the completed test pits may be found to be different (or may be interpreted to be different) from those expected. Variation can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact this office.

This report provides advice on geotechnical aspects for the proposed civil and structural design. As part of the documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of contract documents to confirm the intent of our recommendations has been correctly implemented.



This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in this report then all recommendations should be reviewed. Copyright in this report is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report. The report shall not be reproduced except in full.

Should you require any further information regarding the above, please do not hesitate to contact the undersigned.

Yours faithfully
For and on behalf of
JK GEOTECHNICS

A handwritten signature in black ink, reading 'P. Wright'.

Peter Wright
Senior Associate

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