



Land Use Change & Encroachment Safety Management Study Report for Victorian Planning Authority



**AS 2885 Pipeline Impact Assessment of Wonthaggi North
East Precinct Structure Plan re-zoning proposal adjacent to
existing Multinet gas transmission pipeline**



Revision	Date	Description	Originator	Reviewer
A	11/8/21	Draft issued for comment	Jeff Jones	Crystal Tang (VPA)
B	27/8/21	Revised with VPA comments	Jeff Jones	Crystal Tang (VPA)
C	29/9/21	Final Report for review	Jeff Jones	Crystal Tang (VPA)
D1	15/10/21	Final Report	Jeff Jones	Crystal Tang (VPA)

Disclaimer

This report has been prepared as an account of the work undertaken by pda for the Victorian Planning Authority (VPA) per the RFQ response submitted by JJ Project Consulting Pty Ltd (trading as pda) dated 24/3/21 and accepted in VPA letter dated 8/4/21 including Purchase Order Contract (Ref D/21/1833).

The role provided by pda was restricted to preparation of a draft Pipeline Impact Assessment for review and facilitation at an SMS workshop with the agreed stakeholders. Pda assisted the entities to analyse, mitigate potential risks and enable Licensee compliance from the proposed re-zoning and expected development and encroachment activity, in accordance with AS 2885.6 – 2018 Clauses 5.5.2 & 5.5.3.

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Glossary

ALARP	As low as reasonably practicable. Risk associated with a threat is deemed ALARP if the threat is controlled, or the residual risk is assessed to be low or negligible, or the residual risk is assessed to be intermediate and is formally demonstrated to be ALARP
API 5L X42	Pipeline material grade specified by American Petroleum Institute
Encroachment	Work by third parties within the pipeline corridor, or activities in proximity that could affect the pipeline system (e.g., blasting, earthworks)
Failure Event	Unplanned event that prevents the pipeline system from achieving its specified performance, including: (a) Loss of containment & (b) Restriction or shutdown of supply affecting the community
HCA	High Consequence Area - location where failure event can be expected to result in multiple fatalities or significant environmental damage, including as a minimum location classes T1, T2, I, S and E
Land Use Change	Any change outside the pipeline corridor but within the measurement length, such that there is either a change in location class, or an increase in the likelihood or consequences of failure even without change in location class
Licensee	Entity held accountable for the pipeline system under relevant legislation
Location Class	Classification of an area according to its predominant land use and density of human activity, reflecting both the threats to the pipeline system from the land usage and the consequences for the population, should the pipeline system suffer a loss of containment Rural R1 – unused, undeveloped, or used for rural activities Rural R2 – single residence blocks typically in range 1 ha to 5 ha e.g., hobby farms Town T1 – land developed for suburban living Town T2 – land developed for high density community use e.g., multi storey
MAOP	Maximum pressure at which a pipeline system or section of a pipeline system may be operated, following pressure testing in accordance with the AS(/NZS) 2885 series
ML	Measurement Length - radius of the 4.7 kW/m ² radiation contour for an ignited rupture, calculated in accordance with AS/NZS AS 2885.6, applied at all locations along the pipeline
Multinet Gas	Multinet Gas (DB No1 & DB No2) Pty Ltd
SGP	South Gippsland Pipeline, owned and operated by Multinet Gas
Rupture	Failure of the pipe such that the cylinder has opened to a size at least equivalent to its diameter
SMS	Safety Management Study - application of the safety management process to a specific pipeline system, or section of a pipeline system, at a particular point in time
Threat	Any activity or condition that can adversely affect the pipeline system if not controlled.

Note – refer to AS 2885.0 Section 15 Terms and Definitions for additional and more detailed understanding of Pipeline Industry terms and definitions used in this report.

1. Executive Summary

This report provides the record and results of the AS2885 “Land Use Change and Encroachment” Safety Management Study (SMS) undertaken in May 2021, addressing the proposed re-zoning associated with Wonthaggi North East Precinct Structure Plan (PSP) in Bass Coast Shire, Gippsland Victoria.

The purpose of the SMS was fundamentally to identify potential impacts and issues from the Wonthaggi North East PSP and resultant changed land use to the existing Multinet Gas (MG) South Gippsland Pipeline (SGP) Victorian PL 261.

Project Delivery Assurance (pda) was engaged to assist the VPA with undertaking the SMS, including engagement with MG and preparation and facilitation of the SMS Workshop per the safety management and risk assessment process prescribed in AS 2885.6.

An AS2885 Pipeline Impact Assessment (PIA) was compiled to identify potential impacts to the pipeline and to discuss the risk mitigation requirements at a SMS Workshop with VPA, Licensee (MG) and other stakeholders (including Bass Coast Council). The PIA table identified the following impact areas and proposed action items;

1. **Land Use Change (within pipeline/s measurement length)** – 5 items, mainly dealing with avoiding proposed T1 in the Measurement Length by re-design of the Retention Basin, thereby eliminating any required changes to MG’s current R1 location classification;
2. **Encroachment Activities: Construction Phase** – 5 items, 2 main ones being clarity around the intersection location and the future need for MG to review and provide approval of the design and construction of the channel in order to satisfy the required pipeline clearance;
3. **Encroachment Activities: Post-Construction Occupation** – 2 items, addressed by VPA ensuring future developer / land-owner awareness of pipeline presence and the inherent hazard; and
4. **Licensee O&M Access to Easement** – 6 items, confirming no impacts to MG Operations and Maintenance activities and obligations from the PSP, except for additional signage to be considered along PSP boundary.

Additional to the PIA actions a number of specific SMS workshop discussion items were identified and are included in the consolidated SMS Action Plan. Refer Section 4.4.2 and Attachment 5.

The results of the SMS will help inform the finalisation of the Wonthaggi NE PSP, including Standing Advisory Committee (SAC) Hearing, and subsequent Development Application processes with adoption of project controls to satisfy AS2885 and MG’s requirements.

2. Background & PDA Engagement

Background – The Victorian Planning Authority (VPA) issued Request for Quotation (RFQ) with a detailed Project Brief seeking the services of an appropriately qualified and experienced consultant to undertake a Safety Management Study (SMS) for existing gas mains in relation to proposed land use changes associated with the Wonthaggi North East Precinct Structure Plan (referred to hereon as Wonthaggi NE PSP).

Per VPA documents “the PSP covers a total of 633 hectares, of which 519 hectares is developable, and will guide the development of a new growth area in Wonthaggi and will plan for the construction of approximately 5,000 new homes over the next 30 to 50 years. It will also identify what infrastructure is needed to support the growing community, such as roads and community facilities, and land for employment and retail”. Refer Figure 1.

In the process of receiving submissions on the exhibited Wonthaggi NE PSP (and associated Development Contributions Plan and Native Vegetation Precinct Plan), Bass Coast Shire Council became aware of the presence of an existing transmission pressure gas pipeline owned by Multinet Gas (MG). The gas transmission pipeline terminates in a City Gate station north of the precinct. The VPA confirmed with MG the existence of their assets and is consequently working with MG and Bass Coast Shire to ensure that future land use and construction within the measurement length of the high-pressure gas pipeline can be undertaken in a manner that accounts for any identified safety considerations and complies with AS 2885 and its enabling legislation.

While there were multiple gas utility pipelines present in the precinct (Figure 2), it was established that an AS2885 SMS is to focus on the impact of proposed land uses on the “transmission pressure gas pipeline” (detailed in Section 3.2.1) only.



FIGURE 1 – Location of VPA Wonthaggi North East PSP

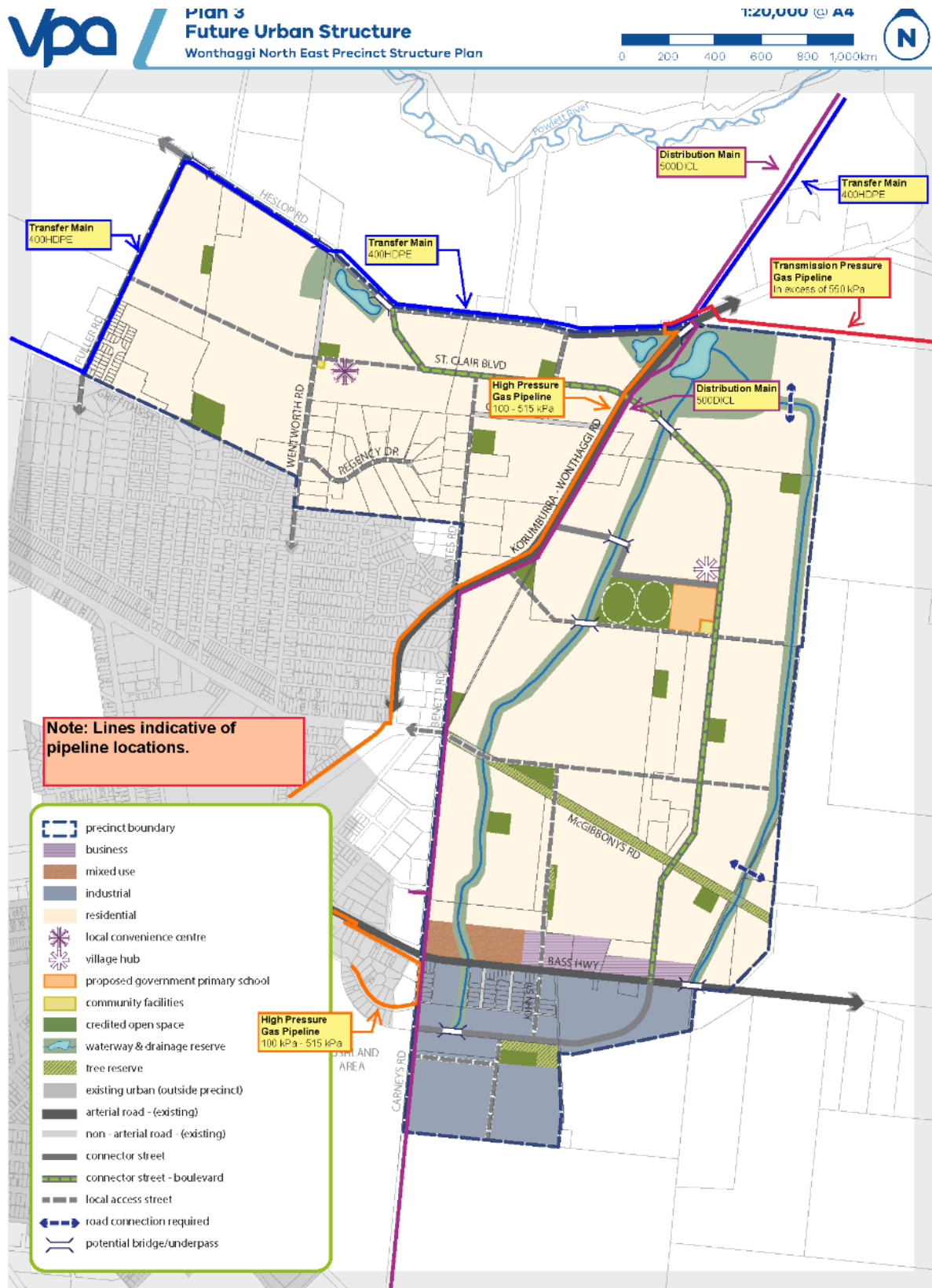


FIGURE 2 – Pipelines identified by VPA

Note – VPA advised this plan is current at the time of writing this report but subject to change as planning process progresses.

A Standing Advisory Committee (SAC) Hearing for the project is scheduled to address outstanding issues raised by submitters and the impacts of the transmission gas pipeline. The SMS is crucial to inform the VPA's position at the SAC Hearing.

VPA has advised that "the current Future Urban Structure proposes a connector boulevard and several drainage assets towards the northern end of the PSP that may impact on the gas pipeline. These infrastructure items were identified and designed before the existence of the transmission gas pipeline was known. All other affected land is proposed to be residential".

Pda Engagement

The VPA RFQ Part B (Proposal Form) was completed and submitted to VPA with key content as follows.

- Pda declared previous engagement by Licensee (AGIS/MG) for provision of Safety Case / PMS internal technical compliance audits and SMS workshop facilitation services. Pda contacted MG Technical Compliance Officer and confirmed nil Conflict Of Interest existed from MG's perspective and that pda knowledge and experience of MG pipelines/ operations is of benefit to VPA
- Pda confirmed key detailed tasks included:
 - Preliminary advice
 - Workshop preparation
 - Workshop
 - SMS reporting – draft and finalisation
- Pda confirmed understanding of the Project Brief and can assist VPA to achieve the aims of the study within the required timeframes
- Pda confirmed the proposal will respond to all requirements defined in the RFQ Part A Scope and services
- Pda confirmed Jeff Jones industry awareness and knowledge of Multinet Gas (MG) existing South Gippsland Pipeline license 261 and MGN Safety Case / PMS & pipeline personnel
- Pda SMS Terms of Reference (template) described pda approach to a AS2885 Land-Use-Change (LUC) SMS and proposed workshop preparation & methodology

VPA issued pda an approved Purchase Order on 8/4/21 with a variation for compilation of a formal narrative report to support VPA processes.

3. SMS Purpose & AS2885 Objectives

Inception Meeting

An Inception Meeting was held on 1/4/21 and attended by pda and VPA to confirm the project scope and objectives. Actions were issued as follows:

1. Pda to assist VPA to firm up indicative pipeline details pre-SMS;
2. Pda to confirm transmission vs distribution pipeline scope with MG; and
3. VPA to provide pda copy of MG email for pda to make initial contact.

Objectives - The purpose of the SMS was fundamentally to identify potential impacts and issues from the Wonthaggi NE PSP (and assumed subsequent development) and resultant changed land use, using the safety management and risk assessment process prescribed in AS 2885.6.

The SMS was a platform for stakeholders to derive solutions (sometimes being a sensible combination of revised design and/or the operators O&M procedures and controls) to ensure that the pipeline safety for the public and pipeline integrity can be maintained when the re-zoning and developments proceed.

Any changed land use needs to assess any change to the prescribed AS 2885.6 Location Classifications and ensure any changed Location Class meets the requirements of AS 2885.6, including the retrospective assessment for Special Considerations for High Consequence Areas. Essentially, any increased societal risk needs to be recognised and mitigated to as low a level as reasonably practicable (ALARP).

Section 7.5.5 of AS 2885.3-2012 defines the requirement to assess any change of location class due to land use changes and urban developments. The primary objective of an encroachment pre-construction SMS is to “undertake a review of the safety management study in context of the proposed encroachment design and function”. The review shall specify any corrective actions required for the design to comply with the AS 2885 standard prior to construction.

The results of the SMS will help inform the finalisation of the Wonthaggi NE PSP and subsequent Development Application processes and adoption of project controls to satisfy MG’s standard requirements.

The battery limits established for the SMS were limited to the chainage of the pipeline within a Measurement Length of the Wonthaggi NE PSP area as per Figure 3 below. Noting, the AS2885 Measurement Length concept is discussed further in section 4.2.1.

The application of the AS2885 Safety Management Process satisfies the legislative requirements associated with the Victorian Pipeline Licensee per the Victorian Pipelines Act 2005 and Pipelines Regulations 2017.

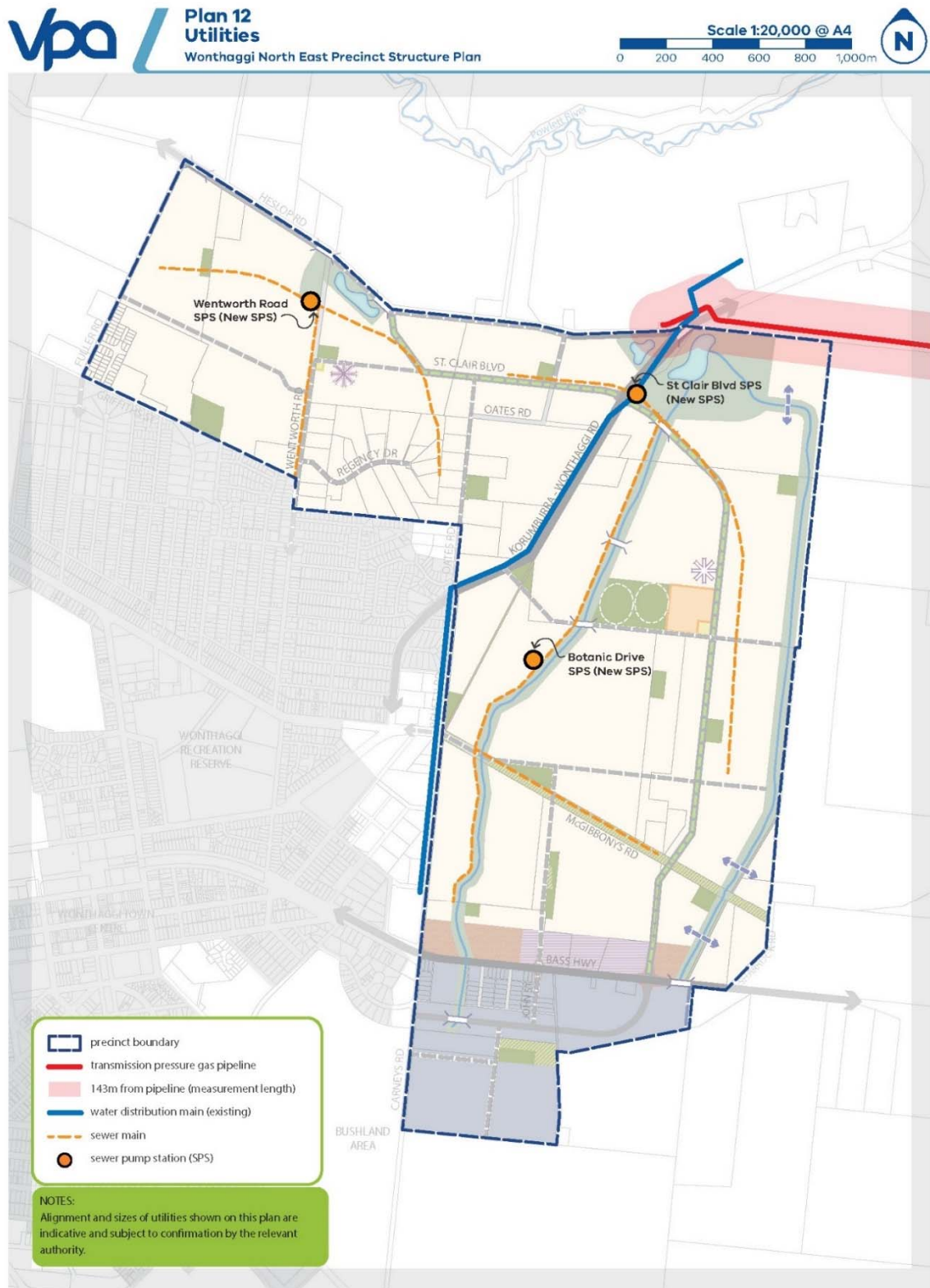


FIGURE 3 – PSP Boundary and pipeline corridor area (including 143m Measurement Length)

Note – VPA advised this plan is current at the time of writing this report but subject to change as planning process progresses.

4. SMS Process Undertaken

The SMS was planned and implemented in compliance with AS 2885.6-2018.

The pda RFQ response and recommendation to VPA was to compile an initial AS2885 Pipeline Impact Assessment (PIA) that considered risk mitigation and to discuss the risk mitigation requirements at a SMS Workshop with VPA, Licensee (MG) and other stakeholders (including Bass Coast Council).

The AS 2885.6 safety management process was followed for the SMS and a pda industry standard AS 2885 pipeline risk assessment was utilised to identify potential impacts and to capture compliance requirements and the agreed SMS actions for both VPA and MG.

4.1. PSP Review & Initial Advice

In applying the SMS process the exhibited version of the Wonthaggi NE PSP was used as the basis for examining encroachment activity, change in land use (for Location Class) and identification of any changed or new threats as a result of the proposed precinct scope and change of land use.

The following broad areas of potential pipeline impact were identified in the PIA:

1. Land Use Change (within pipeline/s measurement length.
2. Encroachment Activities – Construction Phase.
3. Encroachment Activities – Post Construction Occupation; and
4. Licensee O&M Assess to Easement.

The PIA was populated with potential impact areas under the above sub-headings and provided to VPA for comment prior to the SMS Workshop.

4.2. SMS Workshop Preparation

4.2.1. Multinet Gas Data

The pda template for MG Pipeline Data was utilised to extract relevant pipeline and licensee data for the SMS workshop preparation. Refer to Attachment 1.

The South Gippsland Pipeline (Victorian PL 261) location was confirmed relative to the PSP.

Existing Location Class was advised by MG as Rural (R1) based on the calculated pipeline Measurement Length of 143m. AS2885.0 Clause 1.5.41 defines Measurement Length as “the radius of the 4.7 kW/m² radiation contour for an ignited rupture, calculated in accordance with AS/NZS AS 2885.6, applied at all locations along the pipeline” and further notes that Measurement length is used in the determination of location class regardless of whether rupture is a credible failure mode.

NOTE: A thermal radiation level of 4.7 kW/m² will cause injury, at least second-degree burns, after 30 seconds' exposure. A thermal radiation level of 12.6 kW/m² represents the threshold of fatality, for normally clothed people, resulting in third degree burns after 30 seconds exposure.

Mechanical properties and damage resistance qualities of the pipeline were also confirmed. Being designed for a rural Location Class, the pipeline does not comply with “no-rupture” requirements, which would be required for Location Class of Town 1 (T1).

An overview of current pipeline operations and maintenance was provided by MG as part of the context setting for the SMS workshop. Awareness and input of the current pipeline operating scenario and threat management is crucial in undertaking an SMS.

The pda SMS Inputs template for a Land Use Change SMS was utilised to record the PIA and SMS Workshop. Refer Attachment 2. All required data for the PIA and SMS Workshop was confirmed with VPA and MG.

Note - Multinet was not able provide GIS data at the PSP location. Accordingly, SMS actions were identified to undertake appropriate field pipeline locating and survey activity, including potholing for positive pipeline identification.

During the SMS Workshop the following assumptions were defined and agreed by project stakeholders as represented by the workshop attendees:

- The risk assessment process is being undertaken by pda in accordance with the Safety Management Study process required under AS2885.6 for gas and liquid petroleum pipelines;
- Licensee and AS 2885 obligations must be met and complied with;
- This SMS is explicitly focused on the Wonthaggi NE PSP and impacts to/from the existing adjacent MG pipeline;
- The re-zoning is per exhibited PSP;
- This SMS review is not for dealing with commercial matters resulting from PIA or SMS risk mitigation actions; and
- Further A2885 SMS may be required for PSP changes and future DA's (as deemed by MG).

4.2.2. PSP Overview & proposed Land Use Change

VPA provided a summary presentation for the purposes of the SMS Workshop including an overview of the PSP drivers and objectives, the planning process to date and proposed land use changes. Refer Figure 4 Title Page.

The proposed land use was summarised as follows:

- 11-12 dwellings per net developable hectare (approx. 5030 dwellings to accommodate 12,000 new residents)
- 61 ha employment land (estimated 2,940 jobs) + mixed use and commercial land proposed
- 3.5 ha proposed government primary school, 6 ha active recreation and community facility co-located
- Village hub and local convenience centre
- Provision of wetlands and drainage areas



FIGURE 4 – VPA PSP Overview Presentation

VPA also provided proposed PSP Maps depicting community infrastructure and utilities, as well as transport and drainage projects for the PSP. Refer Figure 5.

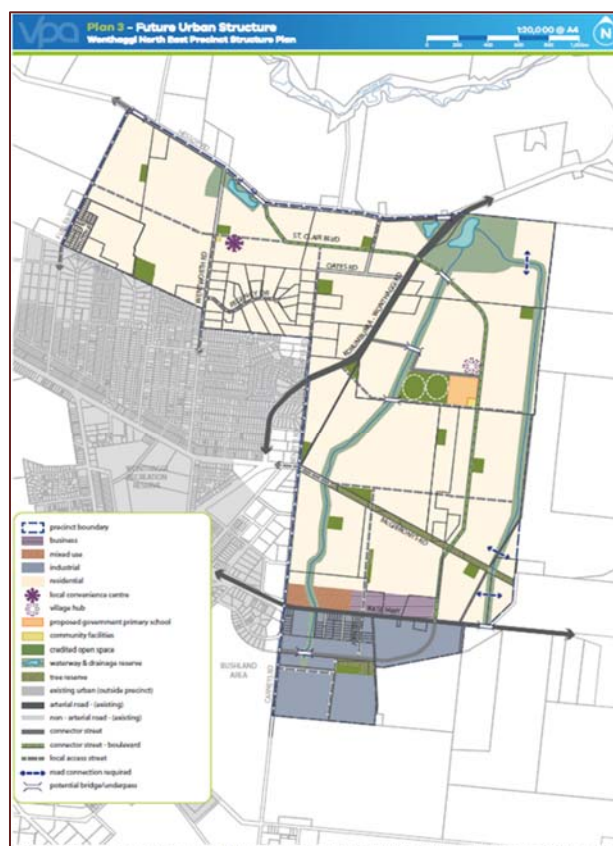


FIGURE 5 – Wonthaggi NE PSP Land Use Change

Note – VPA advised this plan is current at the time of writing this report but subject to change as planning process progresses.

4.2.3. Pipeline Impact Assessment Table

Based on the MG input data and VPA PSP Overview, pda undertook an initial AS2885 PIA and created line items in the PIA Table to represent potential issues requiring consideration and/or risk mitigation. Given the early concept nature of the PSP and the advantage of consultation in the SMS process, the expectation (as per AS2885) was to eliminate where possible any new or modified risk to the pipeline. This premise is central to AS2885 as reducing risk to the pipeline inherently reduces risk for the public safety, environment, and supply. Refer to Attachment 3 for the completed PIA Table.

4.3. SMS Workshop with Multinet Gas

To be effective, an SMS workshop requires an independent Chair and informed functional stakeholders to determine the efficacy of controls from the pipeline initial design and construction, tempered with a current view of the effectiveness of O&M activities and integrity management programs, consideration of physical pipeline easement management for third party interference (including from the project construction phase), and to satisfy any changed location class from the proposed PSP land use.

For the Wonthaggi NE PSP SMS, the threat identification was focused on the location specific threats that would be introduced because of the re-zoning within the measurement length as well as any physical works and construction activity on and/or around the easement.

Jeff Jones of pda provided the chair role through independent preparation and facilitation of the workshop and pda has developed a tailored approach to facilitation of AS 2885.6 SMS workshops, including meeting the relevant aspects and defined methodology per Section 2. Noting that in an SMS workshop, per the requirements in AS 2885.6 “The facilitator should be thoroughly familiar with the pipeline SAFETY MANAGEMENT PROCESS and be sufficiently independent to ensure that each issue is debated openly and thoroughly. The facilitator should have skills in drawing information and opinions out of all attendees in a workshop environment.”

4.3.1. Agenda & Participants

The SMS risk assessment workshop was planned as per AS 2885.6 Appendix J normative guidance for the “Integrity of the Safety Management Process”.

Due to Covid-19 travel restrictions an online Teams Meeting was adopted for the SMS Workshop. As such, a Teams Meeting Notes tool was used to record the following workshop proceedings:

- Meeting Date & Location;
- Participants (invited & other, apologies);
- Agenda;
- Parking Lot; and
- Discussion Notes.

Refer to Attachment 4 for copy of the Meeting Notes inclusive of the Workshop Agenda. All stakeholders attending the workshop were consulted to verify and Agree with the discussion notes.

4.3.2.SMS Workshop Actions

During the SMS Workshop a number of specific workshop actions were noted and agreed for action by both MG and VPA relating to revision of the PSP. These items were considered as a priority and precedent to implementing the full actions from the PIA.

In total there are 7 items, allocated to VPA / EnGenY / MG as agreed in the workshop wrap-up.

Refer Table below, noting timeframes for items 1-6 were recommended to be addressed as soon as practical following the workshop, whereas item 7 is to ensure all items on the Impact Assessment Table are included in the PSP revision.

Item	SMS ACTION ITEM	RESPONSIBILITY	TIMING
1	MG to provide/verify pipeline GIS location data, within KP's affected by the PSP	MG	Post-workshop
2	VPA to make formal request to MG (for Comdain) to perform potholing (and AHD datum surveying as required) at required locations for proposed culvert location	VPA	Post-workshop
3	VPA to update the appropriate PSP Future Urban Structure Plan with the confirmed pipeline location & depiction of the Measurement Length	VPA	Post-workshop
4	Engeny and VPA to revisit drainage strategy and ability to "re-design" the drainage basin area/layout to eliminate T1 (land developed for suburban living) in Measurement Length in PSP	VPA	Post-workshop
5	Engeny and VPA need to further develop the proposed channel concept design in current VPA planning phase, sufficient to ensure an achievable outcome and include the solution in the PSP revision.	VPA	Post-workshop
6	VPA (GTA) to provide a concept drawing to confirm battery limits of proposed intersection (IN-03) and scope of works within pipeline easement	VPA	Post-workshop
7	VPA to ensure SMS requirements become controls ("Requirements" or "Guidelines" in PSP document.	VPA	Structure Plan revision

Table 1 – SMS Workshop Actions

The SMS Workshop Actions were issued on 7/5/21 to the VPA and MG following the workshop to allow prompt implementation of these priority items.

4.4. SMS Results

4.4.1. Finalised Land Use Change & Encroachment PIA Table

The PIA prepared by pda was thoroughly reviewed and further populated during the SMS Workshop. Refer to Attachment 3 for the finalised PIA Table.

All items were rigorously discussed and addressed to ensure the risk was either mitigated or actions identified to ensure any residual risk was ALARP and acceptable to MG.

Changes to existing Location Class were assessed by assessing the proposed land use within a radius of one Measurement Length from the pipeline as per AS2885.6 Clause 2.2.

A summary of the PIA table is presented as follows:

1. **Land Use Change (within pipeline/s measurement length)** – 5 items, mainly dealing with avoiding proposed T1 in the ML by re-design of the Retention Basin, thereby eliminating any required changes to MG's current R1 location classification.
2. **Encroachment Activities: Construction Phase** – 5 items, 2 main ones being clarity around the intersection location and the future need for MG to review and provide approval of the design and construction of the channel to satisfy the required pipeline clearance;
3. **Encroachment Activities: Post-Construction Occupation** – 2 items, addressed by VPA ensuring future developer / land-owner awareness of pipeline presence and the inherent hazard; and
4. **Licensee O&M Access to Easement** – 6 items, confirming no impacts to MG Operations and Maintenance activities and obligations from the PSP, except for additional signage to be considered along PSP boundary.

4.4.2. Agreed SMS Action Plan

All PIA and SMS Workshop action items have been compiled into a consolidated SMS Action Plan – Refer Attachment 6.

In summary, the actions include items identified through the PIA as well as actions from the SMS workshop proceedings. The PIA actions are essentially implications from the proposed PSP required by MG and VPA to ensure compliance with AS2885 safety management requirements.

The more significant actions include the following;

1. to eliminate the introduction of population density (per AS2885 T1 Location Class) or sensitive land uses within the MG pipeline measurement length;
2. to refine infrastructure designs in proximity to the pipeline to the satisfaction of Multinet; and
3. for VPA to update planning documentation to the satisfaction of Multinet.

The SMS Action Plan (in native file format) has been provided to VPA and MG to confirm the proposed workshop actions and nomination of appropriate responsible party/person and a required due date.

4.5. Conclusions

The multiple objectives of the Wonthaggi PSP SMS were achieved in terms of providing a suitable forum for the VPA, MG and other stakeholders to examine the potential impact on the existing pipeline from the proposed land use change and encroachment construction works.

Constructive discussions were held during the workshop and a draft PIA was finalised to form the basis for the VPA's position at the SAC Hearing.

The SMS Action Plan has been compiled to capture all actions and has been accepted by the VPA and MG including the assignment of tasks and due dates. Taking the SMS Action Plan items forward with rigour and intent is the crucial deliverable from this Safety Management Study.

To achieve this, VPA should address the significant actions as summarised in this report:

1. Eliminate the introduction of population density (per As2885 T1 Location Class) or sensitive land uses within the MG pipeline 143m measurement length;
2. Refine infrastructure designs in proximity to the pipeline to the satisfaction of Multinet; and
3. Update planning documentation to the satisfaction of Multinet.

At the time of writing this report, VPA advised that they have progressed the above actions to the satisfaction of Multinet.

Attachment 1 – Licensee Input Data

1.0 Pipeline Overview

Pipeline Characteristic	Licensee Data	Comment
Name of Pipeline	South Gippsland Pipeline	
License No.	PL 261	
Product/s	Natural Gas	

2.0 Pipeline Section (adjacent to proposed development)

Section Battery Limits		Location Description / Current Land Use	Current Location Classifications	
Start KP	End KP		Primary	Secondary
		Farm land	R1	-

3.0 Mechanical Properties

Pipeline Characteristic	Licensee Data	Comment
License MAOP	10,200 kPa	8,700 MOP (Bass Gas capacity)
Nominal Diameter	DN 150	
Material Grade	X42	
Design Wall Thickness	4.8mm	6.4mm for crossings & HC areas
Depth of Cover	1200 nominally	

4.0 Radiation Contour / Measurement Length

Hole Size	12.6 kW/m2	4.7 kW/m2
Full-bore rupture	87m	143m
Other relevant hole size = (ie for largest credible threat)		

Maximum credible hole size = [125mm based on 55T excavator fitted with PT or Tiger Tooth](#)
 The Measurement Length used by Licensee at proposed development location = [143 metres](#)

5.0 Damage Resistance

Pipeline Characteristic	Licensee Data	Comment
Design Hoop Stress	53% (4.8mm W.T) 39.5% (6.4mm W.T)	@ MOP of 8700 kPa
Critical Defect Length	TBA – post SMS	

A. Are Resistance to Penetration Tables available per AS2885.1 Appendix E? [Yes](#)

B. Has a High Consequence Assessment been undertaken for the effected pipeline section? [_No_](#)

I. No-rupture satisfied? = [_No_](#) Was an ALARP Assessment required? = [_No_](#)

II. Maximum Energy Release Rate (for largest credible threat) = _____

5.0 External Interference Protection – Current Controls & Methods

Protection	Control	Method	Applied?
Physical	Separation	Burial	Y
		Exclusion	-
		Barrier ie no current slabbing over pipeline	-
	Resistance to Penetration	Wall Thickness - "thin wall"	Y
		Barrier to Penetration	-
Procedural	Pipeline Awareness	Landowner	Y
		Third party liaison	Y
		Community awareness program	Y
		ONE-CALL SERVICE	Y
		Marking = currently R1 spacing 500m	Y
		Activity agreements with other entities	-
		Planning notification zones	Y
	External interference detection	Patrolling – currently monthly per R1	Y
		Remote intrusion monitoring	CG's only

6.0 Other Licensee Data relevant to SMS

DN150, API 5L Grade X42, 4.8mm WT

Excavator Weight (t)	Force of Bucket (kN)	Excavator (General Purpose Tooth)		Excavator (Single Pointed Penetration or Twin Pointed Tiger Tooth)	
		Pipe Resistance to Penetration (kN)	Estimated Hole Size (mm)	Pipe Resistance to Penetration (kN)	Estimated Hole Size (mm)
5	36	135	No Hole	57	No hole
10	69	211	No Hole	69	60
15	99	226	65	81	70
20	127	261	75	89	80
25	151	312	85	93	85
30	172	356	95	98	95
35	191	415	110	105	110
40	206	435	115	112	120
55	236	493	125	115	125

DN150, API 5L Grade X42, 6.4mm WT

Excavator Weight (t)	Force of Bucket (kN)	Excavator (General Purpose Tooth)		Excavator (Single Pointed Penetration or Twin Pointed Tiger Tooth)	
		Pipe Resistance to Penetration (kN)	Estimated Hole Size (mm)	Pipe Resistance to Penetration (kN)	Estimated Hole Size (mm)
5	36	135	No hole	57	No hole
10	69	211	No hole	69	60
15	99	226	No hole	81	70
20	127	261	No hole	89	80
25	151	312	No hole	93	85

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Revision 2

Appendix

Safety Management Study Report
South Gippsland Pipeline (Licence 261)



Excavator Weight (t)	Force of Bucket (kN)	Excavator (General Purpose Tooth)		Excavator (Single Pointed Penetration or Twin Pointed Tiger Tooth)	
		Pipe Resistance to Penetration (kN)	Estimated Hole Size (mm)	Pipe Resistance to Penetration (kN)	Estimated Hole Size (mm)
30	172	356	No hole	98	95
35	191	415	No hole	105	110
40	206	435	No hole	112	120
55	236	493	No hole	115	125

Attachment 2 – Land Use Change SMS Preparation Inputs Table

Item	Information	Applicable	Available	Received	Source / Comment
(h)	Effects of ignited fluid release including the 4.7 kW/m ² (Measurement Length) and 12.6 kW/m ² radiation distances for both rupture and credible leaks and, for high-consequence areas, assessment of conformance with maximum energy release.	Y	Y	-	Available as required by MG. Refer Licensee Pipeline Input Data.
(i)	Pipeline isolation plan .	Y	Y	-	Not required for LUC SMS
(j)	Site layouts and other relevant details for any facilities within the SMS scope	Y	Y	-	Not required for LUC SMS
Section 2 - AS 2885.6 – Clause 5.5.2 Land use Change SMS Inputs					
1	Existing Location Class (primary & secondary) for affected length of pipeline	Y	Y	Y	Refer Licensee Pipeline Input Data – advised as R1.
2	Details of expected land use change and resultant changed population densities	Y	Y	Y	Refer VPA exhibited Precinct Structure Plan for proposed Land Use including objectives, Plan 3 “Future Urban Structure”, Table 3 Housing types by lot size, Plan 7 Road Network. Also refer VPA Background Report.
3	Details of any construction activities close to the pipeline that are associated with the LUC, including particularly type and size of equipment	Y	Y	Y	Refer VPA MARKUP Plans 03 & 05 for proposed Transport & Drainage projects.
4	Any other threats introduced by the Land use Change	Y	Y	-	To be identified in Workshop.
Section 3 - AS 2885.6 – Clause 5.5.3 Encroachment SMS Inputs					

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Item	Information	Applicable	Available	Received	Source / Comment
Section 1 - AS 2885.6 – Clause 5.2.1 SMS Inputs					
(a)	Any previous SMS documentation , and the associated SMS database or equivalent.	Y	-	-	Not required for LUC SMS
(b)	Aerial or satellite imagery of the pipeline route , most recent readily available (noting the recency of the data).	Y	Y	-	MG can provide imagery of pipeline route in SMS workshop.
(c)	Land use information at a level of detail appropriate to the objective of the SMS.	Y	Y	-	Existing farm land.
(d)	Design or as-built documentation recording the pipeline as it is intended to be built or as it currently exists, including particularly details of wall thickness, material grade, depth of cover and other PHYSICAL protection measures and also other infrastructure and features crossed by or in close proximity to the pipeline	Y	Y	-	Available as required by MG. Refer Licensee Pipeline Input Data.
(e)	Operating procedures defining procedural protection measures	Y	Y	-	Not required for LUC SMS
(f)	Pipeline integrity management plan (PIMP) defining integrity management activities, procedural measures, asset condition and corrosion mitigation	Y	Y	-	Available as required by MG. Refer Licensee Pipeline Input Data.
(g)	Damage resistance calculations (penetration resistance and Rupture resistance), including assessment of conformance with the ‘NO-RUPTURE’ requirement (see AS/NZS 2885.1:2018, Clause 4.10.2) high-consequence areas; Note - ideally these will be documented in the fracture control plan (or fracture resistance assessment where no fracture control plan was prepared at time of design).	Y	Y	-	Available as required by MG. Refer Licensee Pipeline Input Data.

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Item	Information	Applicable	Available	Received	Source / Comment
1	Full details of proposed construction work methods (including type and size of proposed construction equipment)	Y	N	-	Concepts only available from VPA PCP. Detailed DA's will follow approved PCP.
2	Details of any permanent structures to be built within the pipeline corridor.	Y	Y	-	Known item/s to be identified in SMS workshop. Refer MARKUP_Plan 03 & 05 for Transport & Drainage projects.



Attachment 3 – Pipeline Impact Assessment

Note - status of actions were recorded at time of the SMS. Any subsequent actions undertaken by MGN and/or VPA are separate to the SMS process.

Item	Reference / Source	AS2885 Impact / Query	Potential Pipeline Licensee Impact / Action	SMS Assessment / Actions		
				MGN	VPA	Closed
1. Land Use Change (within pipeline/s measurement length)						
1.1	PSP – Plan 3 Future Urban Structure: “Residential”	Will result in a change of current primary location classification Rural (R1) to Town Suburban (T1) <ul style="list-style-type: none">- Residential- May include <10% (in ML) higher density / shopping	Change of land use assessment required <ul style="list-style-type: none">- Assessment to meet High Consequence Area requirements<ul style="list-style-type: none">o “No-rupture” Pipeo Maximum Energy Release (<10 GJ/S)- Depth of Cover (5.4.2)- Isolation Plan (4.8.3)- Fracture control (5.3.2)- Signage spacing (4.10.1)- Patrol frequency (Part 3)- ERP (Part 3)	No impact to current LC in the section of pipeline adjacent to the PSP. Ie no review of existing controls or ALARP study necessary.	VPA to investigate the ability to revise the allocation of the PSP area within pipeline ML currently designated as “Residential” to be “Waterway & Drainage Reserve” ie for use as part of the Retention Basin. If investigation can’t achieve no T1 in ML, will necessitate re-evaluation of T1 implications.	No
1.2	PSP – Plan 3 Future Urban Structure: “Village Hub” “Local Convenience Centre”	Will result in a change of primary location classification Rural (R2) to Town High Density (T2) <ul style="list-style-type: none">• Village Hub• Local Convenience Centre	Change of land use assessment required <ul style="list-style-type: none">- Assessment to meet High Consequence Area requirements<ul style="list-style-type: none">o Maximum Energy Release (<1 GJ/S)- Signage spacing (50m)	Proposed T2 locations are outside MG pipeline measurement length. Ie no change to existing LC	Any changes to location of Town & Local Centres need to be strictly controlled. Ie if locations change will necessitate re-evaluation of T2 implications.	No

Item	Reference / Source	AS2885 Impact / Query	Potential Pipeline Licensee Impact / Action	SMS Assessment / Actions		
				MGN	VPA	Closed
1.3	PSP – Plan 3 Future Urban Structure: “Primary School” “Community Facilities”	Will result in addition of “Sensitive” secondary Location Classifications/s <ul style="list-style-type: none"> Not proposed school within ML Day Care Centres will be likely (not currently shown PCP) Nil Aged Care facilities Nil prisons 	Change of land use assessment required <ul style="list-style-type: none"> Assessment to meet High Consequence Area requirements <ul style="list-style-type: none"> Maximum Energy Release (<1 GJ/S) Signage spacing Landowner Liaison 	No change to LC.	<p>Nil Sensitive uses proposed within ML in PSP.</p> <p>Ensure awareness for Sensitive Use Land Use Change SMS for any future Child-Care Centres in ML.</p> <p>VPA to cover in PSP planning controls.</p>	No
1.4	PSP – Plan 3 Future Urban Structure: “Credited Open Space”	Will result in addition of “Crowd” secondary Location Classifications/s <ul style="list-style-type: none"> Public areas Sportsfields Walking tracks in Retention Basin 	Risk assessment of threats affecting “crowd” population.	<p>Acknowledgement that the proposed public amenity (eg walkways) in the Retention Basin within the ML would be considered accepted with existing controls.</p> <p>May need further evaluation to recognise as a Crowd Secondary Class but no implications to PSP expected.</p>	<p>Ensure Council/s aware of pipeline hazard in planning community uses.</p> <p>VPA to cover in PSP planning controls.</p>	No
1.5	PSP – Plan 3 Future Urban Structure:	Will result in addition of “Environmental” secondary Location Classifications/s <ul style="list-style-type: none"> Environmental sensitive elements 	Consideration of consequence assessment and apply T1 or T2 primary location classification controls as applicable.	No addition of secondary class “Environmental” required to be added due to addition recognise addition of the Retention Basin.	No specific action required.	Yes

Item	Reference / Source	AS2885 Impact / Query	Potential Pipeline Licensee Impact / Action	SMS Assessment / Actions		
				MGN	VPA	Closed
	"Waterways & Drainage Reserve"	ie protected vegetation under conservation land Refer MARKUP_Plan 05 Drainage Projects.				
2. Encroachment Activities – Construction Phase						
2.1	Future DA's – Dwelling Construction	Will require management of construction activities <u>adjacent to</u> pipeline easement	Need to assess threat & controls for accidental impact with pipeline. Eg from dozer, excavator, augers <ul style="list-style-type: none"> - Damage to coating - Hole/Rupture of pipeline and ignited gas release 	Based on agreed removal of residential along PSP boundary, nil housing development or construction activity adjacent to easement. le desktop 40m away from pipeline.	Ensure process for MG referral/involvement in future DA approvals by Council/s that involve PSP boundary works adjacent to the pipeline easement. Eg the Retarding Basin construction and boundary treatment (fence? Roadway?)	No
2.2		Will require management of construction activities <u>on or over</u> pipeline easement	Need to assess threat & controls for accidental impact with pipeline during installation. Eg from dozer, excavator, augers, etc <ul style="list-style-type: none"> - Damage to coating - Hole of pipeline and ignited gas / ethane release - Vibration effects coating - HDD crossing under/over pipeline 	Nil identified in PSP presented – none anticipated		Yes

Item	Reference / Source	AS2885 Impact / Query	Potential Pipeline Licensee Impact / Action	SMS Assessment / Actions		
				MGN	VPA	Closed
2.3	Future development Utility Connections	Will require management of construction activities involving access on/across easement <ul style="list-style-type: none"> - Sewer/water mains - Power lines (UG & O/H HV) - Utility connections (Gas, NBN, Telecoms, etc) - Council Structures 	Need to assess threat of accidental impact with pipeline. <p>Eg from excavators, post-hole diggers, etc</p> <ul style="list-style-type: none"> - Ability to constrain within pre-designed crossings / conduits - Approved crossing designs - Assess electrical CP impacts - Prohibit loading over pipeline 	Nil identified in PSP presented – none anticipated. No action.		Yes
2.4	Future new roads - Arterial Road Connector Street	Construction of new roadways crossing easement <ul style="list-style-type: none"> - Intersection Project (IN-03) <p>Refer MARKUP_Plan 03 Transport Projects.</p>	Need to assess threat of accidental impact with pipeline. <ul style="list-style-type: none"> - Damage to coating - Hole/Rupture of pipeline and ignited gas release - Vibration effects coating <p>May need verification gig / coating assessment.</p> <p>Crossing designs required to meet AS2885 stress loading requirements.</p> <p>May require encasing pipeline / structural (concrete slab) protection.</p>	The intersection design & construction plan will need to be approved by Licensee, including engineering reviews to confirm stress affects and if any protection is required. <p>May also require an inspection dig of coating condition. Ie if future access is constrained or any known defects.</p>	Include Licensee requirements in PSP schedule as a planning condition to trigger future MG involvement (referral) and design approval.	No

Item	Reference / Source	AS2885 Impact / Query	Potential Pipeline Licensee Impact / Action	SMS Assessment / Actions		
				MGN	VPA	Closed
2.5	PSP Retention Basin - Channel construction	<p>Retention Basin requires a discharge to the north via a proposed culvert system (14 x 1200mm culverts) across the road, then into a newly constructed “drainage channel” which crosses the pipeline easement.</p> <p>i. Preliminary design suggests will require 600mm drop in current ground level in easement.</p> <p>ii. Channel design concept would result in approx. 20m width of channel structure across easement. Nb: Could have a trade-off between depth versus width</p>	<p>Chanel design depth will result in reduced depth of cover over pipeline ie current 1.2m reduced to 600mm.</p> <p>Channel structure will impact induced stress loading to pipeline, including from concrete construction and flowing conditions.</p> <p>Future access to buried pipeline would be impeded by addition of channel.</p>	<p>MG Engineering will require review of channel detailed engineering drawings and construction methodology. Minimum vertical clearance between existing pipeline and proposed invert of channel needs to be maintained eg MG policy is minimum 500mm and AS2885.3 guidance is 0.3m.</p> <p>Stress impacts will need confirming to API 1102. Eg could require modified channel design to achieve no loading to pipeline.</p> <p>“Encroachment SMS” will be required to identify and manage construction threats. May require limitation of equipment size & teeth type.</p>	<p>VPA need to develop the proposed channel concept design further in current planning phase, sufficient to ensure an achievable outcome and include the solution in the PSP revision.</p> <p>Location proving (and DoC details) should be utilised for basis of the design concept and verified to AHD.</p> <p>Note – MG can assist VPA with pot-holing field execution using Comdain and MG Patroller present.</p>	No

Item	Reference / Source	AS2885 Impact / Query	Potential Pipeline Licensee Impact / Action	SMS Assessment / Actions		
				MGN	VPA	Closed
3. Encroachment Activities – Post Construction Occupation						
3.1	Future Land Owner – Council	New projects, upgrades or maintenance adjacent or in easement that could result in contact with pipeline Eg road kerbing, playgrounds, pathways	Part of Licensee management of corridor and patrol of activities.	No specific obligations at this stage ie. future EIM controls including Landowner Liaison and Awareness program Additional signage will be installed as necessary.	Ensure future land-owner awareness of pipeline presence and the inherent hazard	No
3.2	Future Land Owner – Private dwelling	House projects or maintenance adjacent or in easement that could result in contact with pipeline Eg cross-overs, fences	Part of Licensee management of corridor and patrol of activities.	Nil identified in PSP presented – none anticipated. No action.		Yes
4. Licensee O&M Assess to Easement						
4.1	Easement Route	Maintaining effective pipeline patrol	Needs to be maintained during construction phase and occupation.	No expected impact as PSP off easement. Patrollers will be maintained throughout the SP implementation.	No action required.	Yes
4.2		Maintaining effective pipeline marking	Needs to be maintained during construction phase and occupation.	New signage installed when required.	Marking to be allowed for in RB boundary locations.	No

Item	Reference / Source	AS2885 Impact / Query	Potential Pipeline Licensee Impact / Action	SMS Assessment / Actions		
				MGN	VPA	Closed
4.3		Maintaining Cathodic Protection test points – readings	Needs to be maintained during construction phase and occupation.	CP located at City Gate site, so no impact by PSP.	No action required.	Yes
4.4		Maintaining vegetation & corridor management	Needs to be maintained during construction phase and occupation.	No impact from PSP.	No action required.	Yes
4.5		Ability for emergency response including pipeline defect inspection & repair - MLV's at both ends only - No Relief points		No impact from PSP.	No action required.	Yes
4.6		Ability for emergency services response and access	Needs to be maintained during construction phase and occupation.	No impact from PSP.	No action required.	Yes

- **Legend**

- Items in Red = SMS Action item
- Items in Green = Item verified/ completed; no action necessary



Attachment 4 - SMS Workshop Meeting Notes

Meeting Date: 7/05/2021 9:00 AM

Location: Microsoft Teams Meeting

Link to Outlook Item: [click here](#)

Invitation Message

Participants

- ☐ [Jeff Jones](#) (Meeting Organizer)
- ☐ [Catherine Bryant](#) (Accepted in Outlook)
- ☐ [Jeff Tait \(VPA\)](#) (Accepted in Outlook)
- ☐ [Emily Killin \(VPA\)](#) (Accepted in Outlook)
- ☐ [Crystal Tang \(VPA\)](#) (Accepted in Outlook)
- ☐ [Chris Braddock \(VPA\)](#)
- ☐ John.Tinkler@vpa.vic.gov.au
- ☐ [Prateek Kateelkar](#) (Accepted in Outlook)
- ☐ [Max York](#) (Accepted in Outlook)
- ☐ glenn.ottrey@engeny.com.au

Other Participants

- Maria Matamala
- John Tinkler (VPA) - part only (11:30 onwards)

Apologies

- Chris Braddock (VPA)
- Emily Killin (VPA)
- Glenn Ottrey (Engeny)

Agenda

1. Participant / Stakeholder Introductions (15 mins - All)
2. AS2885.6 SMS Scope & Objectives (15 mins – All)
3. Proposed Land Use Change (1 hr - VPA)
 - a. Precinct Structure Plan Background (refer Background Report)
 - b. Precinct Structure Plan overview (refer exhibited PSP)
 - c. Associated infrastructure projects (refer MARKUP_Plan 03 & 05)
4. Existing Pipelines overview (30 min - MG)
 - a. Pipeline Input Data
 - b. Operations & Maintenance discussion
5. Land Use Change "Pipeline Impact Assessment" (1 hrs - Licensee/All)
 - a. Location Class changes resultant from PSP
 - b. Pipeline design / controls impacts
 - c. High Consequence Area assessments
 - d. Threat Identification & management of easement Encroachment Activities (1 hr - Licensee/All)
 - During DA's construction
 - During post-construction precinct occupation
 - e. Easement access requirements for ongoing pipeline O&M activities (1 hr – All)
6. SMS Action Plan (All)

Parking Lot

1. Does RB have pumps & therefore power utility crossing pipeline easement - No - free draining anticipated.

Discussion Notes

1. All participants introduced themselves and confirmed expectations
2. Requirements covered per AS2885.3 & SMS objectives per AS2885.6 - all understood & agreed
3. VPA covered PSP overview & history
4. PSP plan reviewed with ML overlay
 - a. Separation off-set of PSP to pipeline easement (Desk-top GIS view of pipe location appears distance is 38m)
5. Drainage design overview
 - a. Proposed retarding basin (RB) utilises land subject to inundation
 - b. Proposed residential area to the right of the basin
 - c. some land fill areas would be required (in PSP only) to achieve free-board etc
 - d. discharges to north via a proposed culvert system (14 x 1200mm culverts) across the road then into a drainage channel crossing the pipeline easement
 - i. Would require 600mm drop in current ground level in easement (for current design)
 - ii. Would result in 20m width of channel structure across easement
 - iii. Could have a trade-off between depth versus width
 - e. No change to topography (or surface water flow) in MG City Gate area
6. Overview of Pipeline data & discussion of current controls and potential impacts & additional requirements from the PSP
7. Overview of PSP road network impacts - upgrade of intersection
8. This SMS evaluation has been constrained to what has been presented s this version of the PSP

Key SMS Actions

1. MG to provide/verify pipeline GIS location data, within KP's affected by the PSP
2. VPA to make formal request to MG (for Comdain) to perform pot-holing (and AHD datum surveying as required) at required locations for proposed culvert location
3. VPA to update the appropriate PSP Future Urban Structure Plan with the confirmed pipeline location & depiction of the Measurement Length
4. EnGenY/VPA to revisit drainage strategy and ability to "re-design" the drainage basin area/layout to eliminate T1 in ML in PSP
5. EnGenY/VPA need to further develop the proposed channel concept design in current VPA planning phase, sufficient to ensure an achievable outcome and include the solution in the PSP revision.
6. VPA (GTA) to provide a concept drawing to confirm battery limits of proposed intersection (IN-03) and scope of works within pipeline easement
7. VPA to ensure SMS requirements become controls ("Requirements" or "Guidelines" in PSP document.

Attachment 5 - SMS Action Plan

Item	SMS Workshop Item	Proposed Action	Accountable	Due Date
SMS Workshop Action Items				
1	Pipeline Location - on drawings	MG to provide/verify pipeline GIS location data, within KP's affected by the PSP	Licensee	Post-workshop
2	Pipeline Location - in field	VPA to make formal request to MG (for Comdain) to perform pot-holing (and AHD datum surveying as required) at required locations for proposed culvert location	VPA	Post-workshop
3	Pipeline Location - on Structure Plan	VPA to update the appropriate PSP Future Urban Structure Plan with the confirmed pipeline location & depiction of the Measurement Length	VPA	Post-workshop
4	Land Use Change - eliminate T1 (in ML)	EnGenY & VPA to revisit drainage strategy and ability to "re-design" the drainage basin area/layout to eliminate T1 in ML in PSP	VPA	Post-workshop
5	Pipeline Easement Encroachment - Drainage Channel	EnGenY & VPA need to further develop the proposed channel concept design in current VPA planning phase, sufficient to ensure an achievable outcome and include the solution in the PSP revision.	VPA	Post-workshop
6	Pipeline Easement Encroachment - Road Intersection	VPA (GTA) to provide a concept drawing to confirm battery limits of proposed intersection (IN-03) and scope of works within pipeline easement	VPA	Post-workshop
7	Pipeline Impact Assessment - controls (see below)	VPA to ensure SMS requirements become "Requirements" or "Guidelines" controls in PSP document.	VPA	Structure Plan revision
Pipeline Impact Assessment				
8	PSP – Plan 3 Future Urban Structure: "Residential"	VPA to investigate the ability to revise the allocation of the PSP area within pipeline ML currently designated as "Residential" to be "Waterway & Drainage Reserve" ie for use as part of the Retention Basin. If investigation can't achieve no T1 in ML, will necessitate re-evaluation of T1 implications.	VPA	Within PSP revision
9	PSP – Plan 3 Future Urban Structure: "Village Hub"	Any changes to location of Town & Local Centres need to be strictly controlled. Ie if locations change will necessitate re-evaluation of T2 implications.	VPA	Post PSP
10	PSP – Plan 3 Future Urban Structure: "Primary School" & "Community Facilities"	Nil Sensitive uses proposed within ML in PSP. Ensure awareness for Sensitive Use Land Use Change SMS for any future Child-Care Centres in ML. VPA to cover in PSP planning controls.	VPA	Within PSP revision
11	PSP – Plan 3 Future Urban Structure: "Credited Open Space"	Ensure Council/s aware of pipeline hazard in planning community uses. VPA to cover in PSP planning controls.	VPA	Within PSP revision
12	Future DA's – Dwelling Construction	Ensure process for MG referral/involvement in future DA approvals by Council/s that involve PSP boundary works adjacent to the pipeline easement. Eg the Retarding Basin construction and boundary treatment (fence? Roadway?)	VPA	Within PSP revision
13	Future new roads - Arterial Road Connector Street	The intersection design & construction plan will need to be approved by Licensee, including engineering reviews to confirm stress affects and if any protection is required. May also require an inspection dig of coating condition. Ie if future access is constrained or any known defects.	MGN	Road design stage
14		Include Licensee requirements in PSP schedule as a planning condition to trigger future MG involvement (referral) and design approval.	VPA	Within PSP revision
15	PSP Retention Basin -Channel construction	MG Engineering will require review of channel detailed engineering drawings and construction methodology. Minimum vertical clearance between existing pipeline and proposed invert of channel needs to be maintained eg MG policy is minimum 500mm and AS2885.3 guidance is 0.3m. Stress impacts will need confirming to API 1102. Eg could require modified channel design to achieve no loading to pipeline. "Encroachment SMS" will be required to identify and manage construction threats. May require limitation of equipment size & teeth type.	MGN	Channel Design stage
16		VPA need to develop the proposed channel concept design further in current planning phase, sufficient to ensure an achievable outcome and include the solution in the PSP revision. Location proving (and DoC details) should be utilised for basis of the design concept and verified to AHD. Note – MG can assist VPA with pot-holing field execution using Comdain and MG Patroller present.	VPA	Within PSP revision
17	Future Land Owner – Council	future EIM controls including Landowner Liaison and Awareness program	MGN	Post construction
18		Ensure future land-owner awareness of pipeline presence and the inherent hazard	VPA	Within PSP revision
19	Easement Route - Maintaining effective pipeline marking	Marking to be allowed for in RB boundary locations.	VPA	Within PSP revision