# MEETING AGENDA

**Title:** Moss Vale Road - Indicative Urban Release Area (URA)
AS2885 "Land Use Change & Encroachment" SMS Workshop

**Location:** Level 2 Conference Room, 84 Crown Street, Wollongong

**Date:** **Tuesday 17th March 2020** **8:30am - 3pm**

**Attendees:**

| | Name | Co. | Title / Role | Available |
|---|---|---|---|---|
| 1 | Jeff Jones | PDA | SMS Chair & Facilitator | ✓ |
| 2 | Gordon Clark | Shoalhaven City Council | Strategic Planning Manager | ✓ |
| 3 | Matt Rose | Shoalhaven City Council | Strategic Land-use Planner | ✓ |
| 4 | Stephen Nall | | Representing the Landowner Group | ✓ |
| 5 | Mark Klein | Allen Price & Scarratts | | ✓ |
| 6 | Andrew Harvey | Endeavour Energy | Capacity Planner | ✓ |
| 7 | George Appuhamy | Endeavour Energy | Engineer, Substation Design | ✓ |
| 8 | Jason Lu | Endeavour Energy | Capacity Planning Manager | ✓ |
| 9 | Gavin Sherriff | Jemena | Lands management | ✓ |
| 10 | Dario Stella | Jemena | Senior Engineer | ✓ |
| 11 | Steve Bonnici | Jemena | Team Leader EGP | ✓ |
| 12 | John PulJak | Jemena | Pipeline Operator EGP | ✓ |

**Objective:**

Conduct a "land use change & encroachment" Safety Management Study (SMS) to assess the proposed land use change and associated encroachment activities, adjacent to the existing Jemena Eastern Gas Pipeline.

The SMS will satisfy the AS 2885 requirements and review any impacts to existing Pipeline Management System (PMS), SMS & Threat Register/s;

- Assess proposed change of land use from indicative URA for resultant impacts to Primary and Secondary Location Classification per AS2885.6 definitions
- Review impacts to existing SMS Risk Register threats, failure modes, risk ratings and controls from proposed changed land use and subsequent encroachment activities
- Identify any new threats for any required changes to indicative URA layout or subsequent DA & construction phase controls

The SMS will identify any required changes to the proposed Urban Release Area and/or constraints to ensure compliance with pipeline operations & maintenance requirements per AS2885 obligations.

Explicitly, the SMS is to allow Shoalhaven City Council to include requirements of the SMS Action Plan in progressing the URA and submission of planning documents with NSW Department of Planning, Industry and Environment

**Agenda:**

| | | | |
|---|---|---|---|
| **1. Data Validation** | | | |
| | 8:30 | Arrival & Introductions – tea & coffee available | |
| 1 | 8:45 | **Workshop Purpose**<br>• Objectives & Methodology | All to agree |
| 2 | 9:00 | **Urban Release Area Overview**<br>• Planning drivers and vision<br>• Indicative layout plan<br>• Expected change of land use (people & amenities)<br>• Expected Development/s methodology & timing<br>• Related developments – roads, utilities, etc<br>• Discuss any questions? | SCC |
| 3 | 10:00 | **Pipeline Operations**<br>• Current EGP operation<br>• Corridor activities & programs<br>• License Conditions & AS2885 obligations<br>• Discuss any questions? | Jemena |
| 4 | 10:30 | **Data validation**<br>1. SMS Summary inc. Key Pipeline Properties<br>2. PMS – review impacts<br>3. Measurement Length & Damage Resistance | Jeff |

*Morning Tea break*

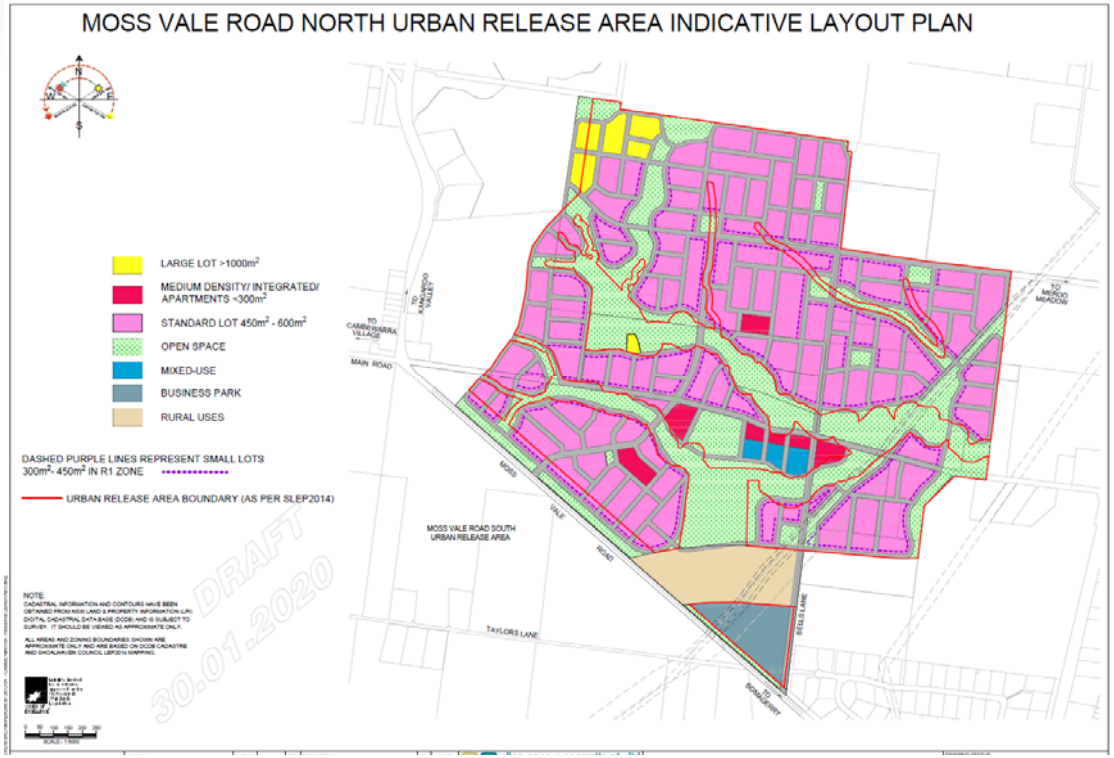
| | | | |
|---|---|---|---|
| **2. Location Class Review** | | | |
| 5 | 11:00 | **Location Class**<br>- Review potential change to AS2885 Location Class<br>- Identify AS2885 compliance impacts and actions | All |
| **3. Threat Identification & Risk Assessment** | | | |
| 6 | 11:30 | **Review Existing Threats**<br>• Review Threat Register for any impacts to existing Threats & Controls from proposed UAP | Jeff to facilitate / All to agree |
| | 12:00 | *Lunch break* | Noting 1pm – assess threats from Endeavour Energy Substation proposal |
| 7 | 12:45 | **Identify & assess new Threats**<br>• Threat Identification - Credible?<br>• Threat Control - Failure Possible?<br>• Risk Assessment – Rating & Additional Controls? | |
| 8 | 3:00 | **Workshop Conclusions**<br>✓ Confirm all Licensee requirements addressed<br>✓ Clear Parking Lot<br>✓ Agree next step/s for SMS Action Plan | SCC / Jemena |

# SMS Workshop

## AS2885.6 Preliminary Safety Management Study – Validation Workshop & Risk Assessment

**Attendees:** updated in SMS workshop

| | Name | Company | Title / Role | Attendance | |
|---|---|---|---|---|---|
| | | | | room | phone |
| 1 | Gordon Clark | Shoalhaven City Council | Strategic Planning Manager | Y | |
| 2 | Matt Rose | Shoalhaven City Council | Strategic Land-use Planner | Y | |
| 3 | Stephen Nall | Landowner | Representing the Landowner Group | Y | |
| 4 | Mark Klein | Allen Price & Scarratts | | Y | |
| 5 | Andrew Harvey | Endeavour Energy | Capacity Planner | Y | |
| 6 | George Appuhamy | Endeavour Energy | Engineer, Substation Design | - | |
| 7 | Jason Lu | Endeavour Energy | Capacity Planning Manager | - | |
| 8 | Gavin Sherriff | Jemena | Lands management | | Y |
| 9 | Dario Stella | Jemena | Senior Engineer | | Y |
| 10 | Steve Bonnici | Jemena | Team Leader EGP | | Y |
| 11 | John PulJak | Jemena | Pipeline Operator EGP | | Y |
| 12 | Graham Towers | DPIE | Manager | Y | |
| 13 | Jeff Jones | Pda | Chair / Facilitator | Y | |




# AS 2885.6 Pipeline Safety Management

## "Land use change & Encroachment SMS"

Proposed Urban Release Area adjacent to existing Jemena petroleum gas pipeline

March 2020

# Welcome & Introductions

Jemena

Shoalhaven City Council

**Other Stakeholders**

- Project development proponents
- Future community – residents
- NSW Statutory Authorities – Pipeline License
- NSW DPIE

pda

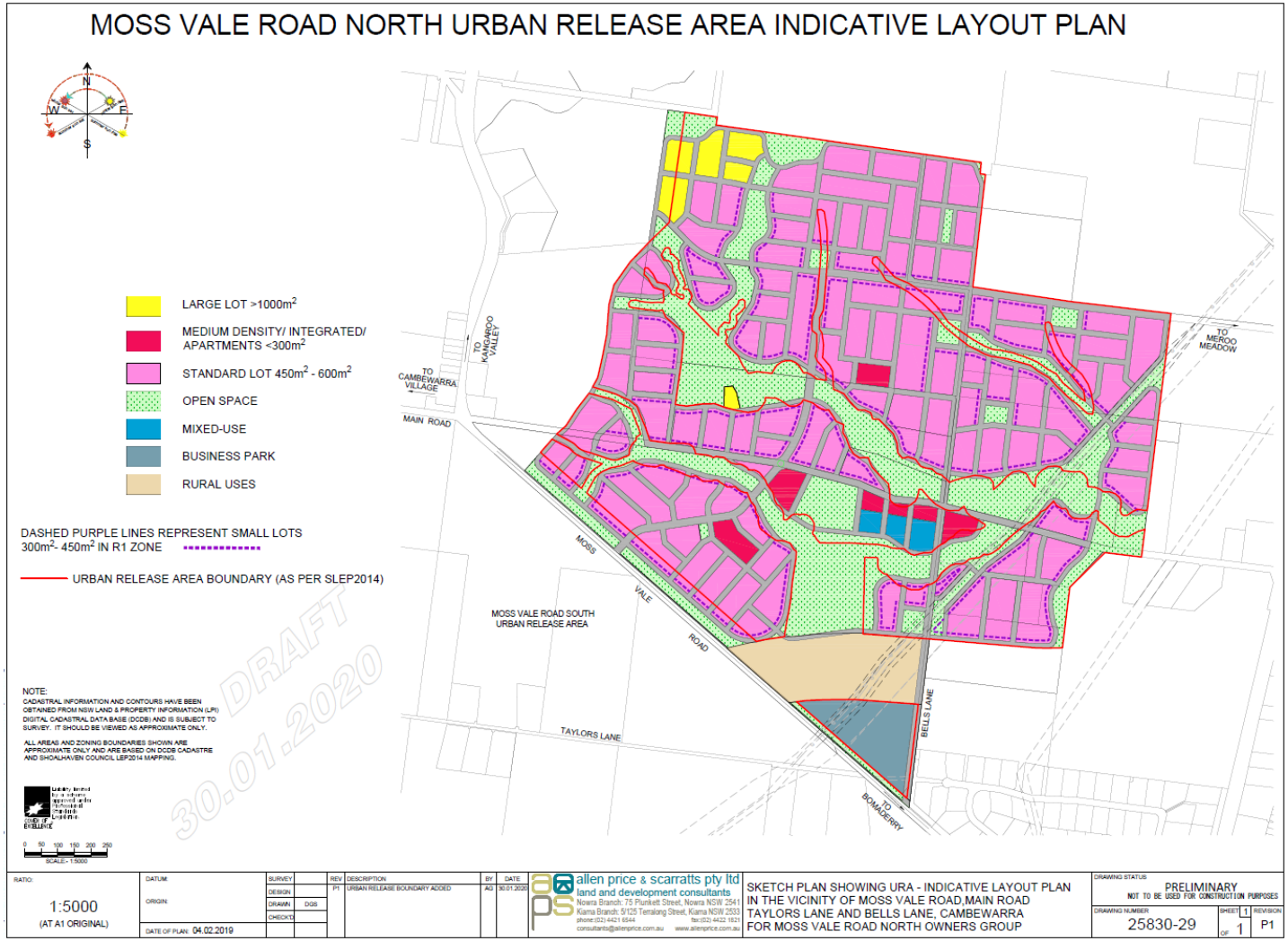
# Agenda

| | |
|---|---|
| ¼ hr | Workshop Purpose |
| 1 hr | Overview – UAP Overview |
| ½ hr | Overview – Pipeline Operations |
| ½ hr | EGP SMS Data Validation |
| ½ hr | AS2885 "Location Class" review |
| | - Identify AS2885 compliance impacts and actions |
| ½ hr | Review "Existing Threats" – impacts? |
| 2 hrs | Identify any new Threats |
| | - Analyse new threats & controls |
| | - Review residual risk & proposed treatments |
| ¼ hr | Workshop Conclusions & SMS Action Plan |

**Workshop Protocols 3P's…**

| | |
|---|---|
| Participation | interaction and robust discussion |
| Parking Lot | defer items, non-SMS related |
| Phones | off but respect business continuity |

# 1a. Workshop Purpose



# 1b. Workshop Purpose


1. **NSW Pipelines Regulations 2013**
   - Cl 11 Pipeline management system to accord with AS 2885
   - Hazardous Event – potential to cause harm…person, property, environment

2. **AS2885.3 (2012): Operation & maintenance**

   Clause 7.5.5 Encroachment / location class – requires Licensee to review the pipeline's SMS to assess the impact and advise the developer of the impact. Additional measures may be required to meet the requirements of AS2885, particularly where land use changes become "high consequence areas" and more stringent control requirements arise.

   The safety management process is performed in accordance with AS2885.1:2012 (superceded by Part 6 in 2018)

3. **AS2885.6 (2018): Pipeline Safety Management**

# 1c. Workshop Purpose


**1.5.62 safety management process**

process that identifies threats to the safety and integrity of the pipeline system and applies controls to them, and (if necessary) undertakes assessment and treatment of any risks to ensure that the risk is reduced to a level that is ALARP

**1.5.63 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

**1.5.60 risk assessment**

systematic (quantitative or qualitative) assessment of the likelihood and consequence of a failure to determine the level of risk in accordance with the methodology described in AS/NZS ISO 31000

**1.5.41 measurement length**

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

- Note 1: Measurement length is used in the determination of location class regardless of whether rupture is a credible failure mode.

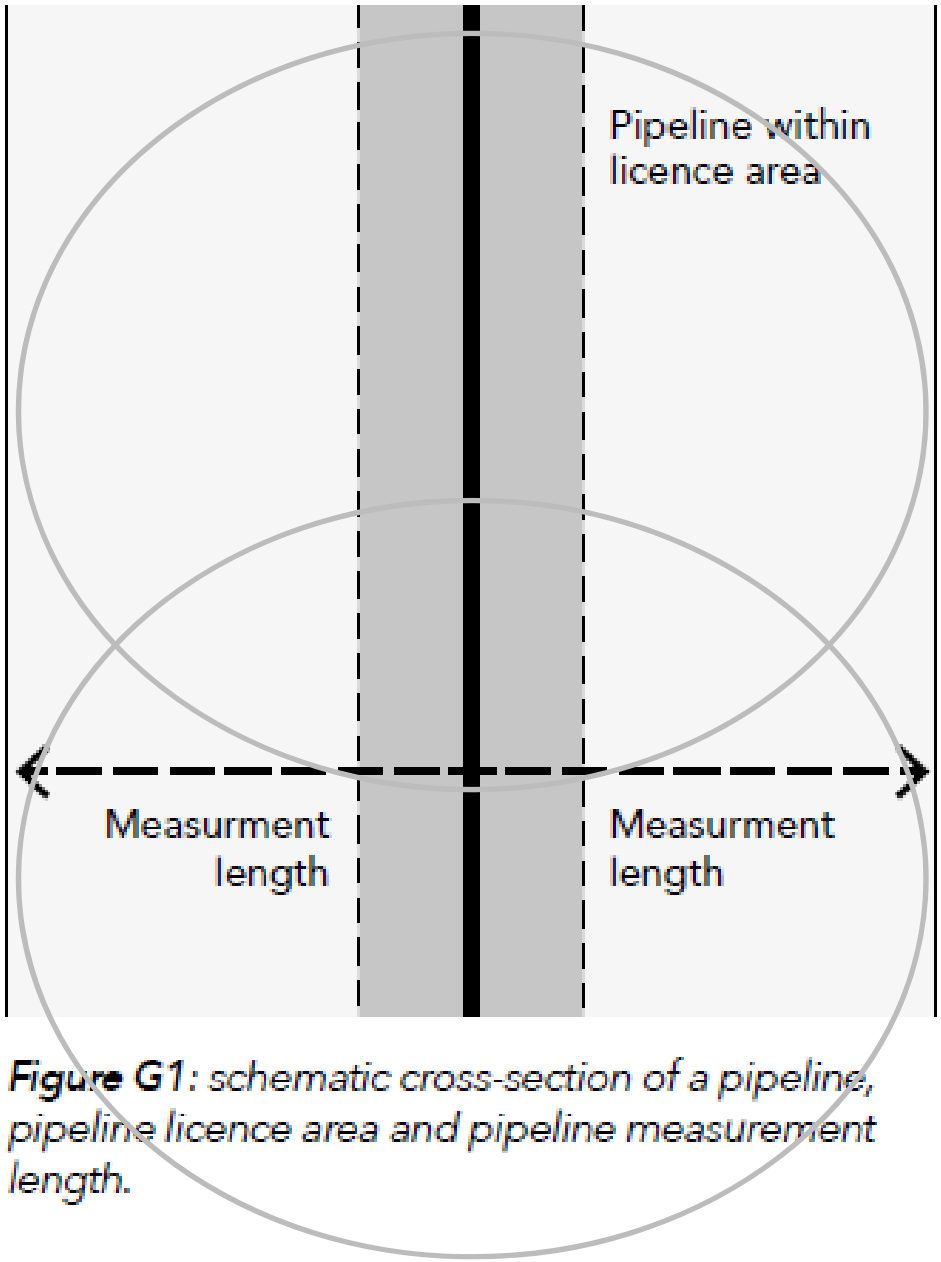



***Figure G1:*** *schematic cross-section of a pipeline, pipeline licence area and pipeline measurement length.*

# 1d. Workshop Purpose


***AS2885.6 - Clause 5.5.2  Land Use Change SMS***

The SAFETY MANAGEMENT PROCESS shall be used to review the changes in risk to and from the pipeline when LAND USE CHANGE is identified or anticipated. The LAND USE CHANGE SMS may be restricted to only that part of the pipeline where there is LAND USE CHANGE within the MEASUREMENT LENGTH.

The objectives of an SMS for LAND USE CHANGE include the following:

(a) Informing stakeholders (e.g. local government, planning authorities, development  proponents) of the requirements of the AS(/NZS) 2885 series.

(b) Reviewing proposed development plans to determine whether they can be optimized to minimize impacts on the pipeline.

(c) Managing construction activities in the vicinity of the pipeline to minimize risk.

(d) Identifying any additional protective measures that might be required so that risk remains ALARP despite changed surroundings.

# 1e. Workshop Purpose


***AS2885.6 - Clause 5.5.3 Encroachment SMS***

The objectives of the encroachment SMS include the following:

- Generate requirements for the third-party work to comply with AS 2885.3.
- Review proposed plans and work methods to determine whether they should be modified to minimize impacts on the pipeline system.
- Identify any new or changed threats and protective measures required so that risk remains ALARP both during the encroachment works and throughout the pipeline life.
- Identify effects of the encroachment on pipeline integrity management activities both during the encroachment works and throughout the pipeline life.

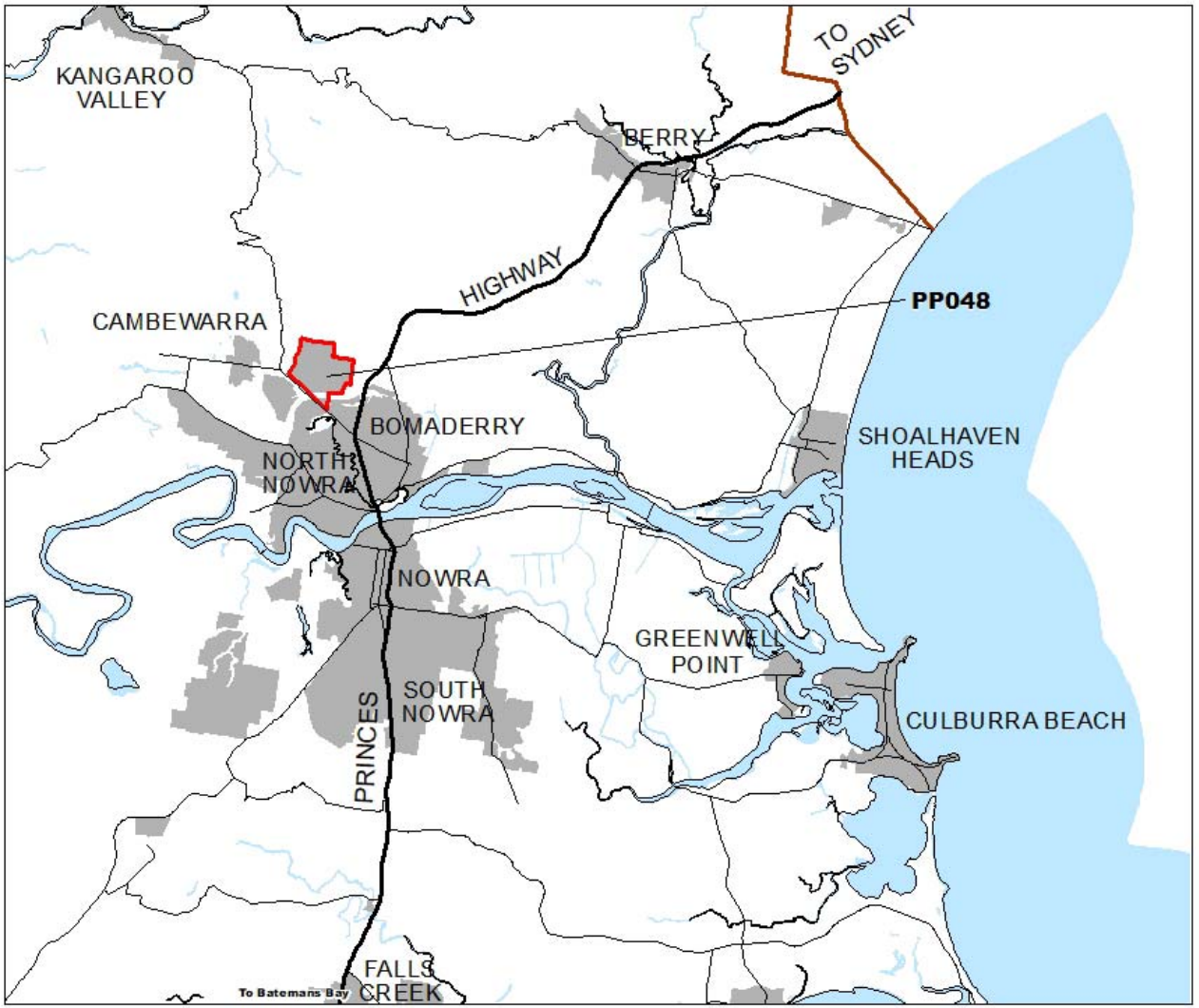
All threats arising from construction activities associated with the encroachment should be controlled.

# 1f. Workshop Purpose

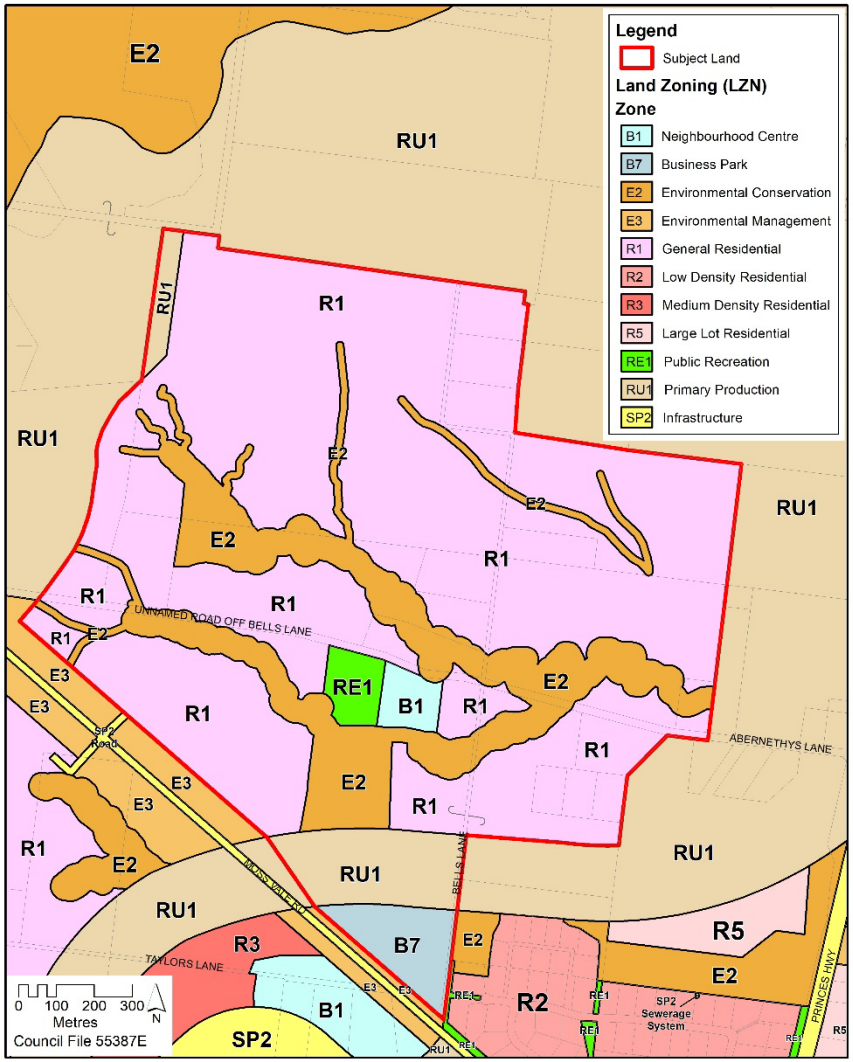
**Assumptions for this SMS review**

1. AS2885 obligations must be met and complied with
2. The risk assessment process is being undertaken by pda according to the Safety Management Study process as required and defined under AS2885.6 for gas and liquid petroleum pipelines.
3. Pipeline integrity is being maintained by Jemena per laws & regulations and EGP Pipeline License/s
4. Pipeline design and current controls are implemented per Jemena PMS and monitored for effectiveness
5. Correspondence from Jemena & SCC
6. This SMS workshop is not for dealing with commercial matters resulting from SMS risk assessment actions
7. Basis for Sub-station is a location will be chosen that is adjacent to the pipeline easement.

# 2a. Overview of URA



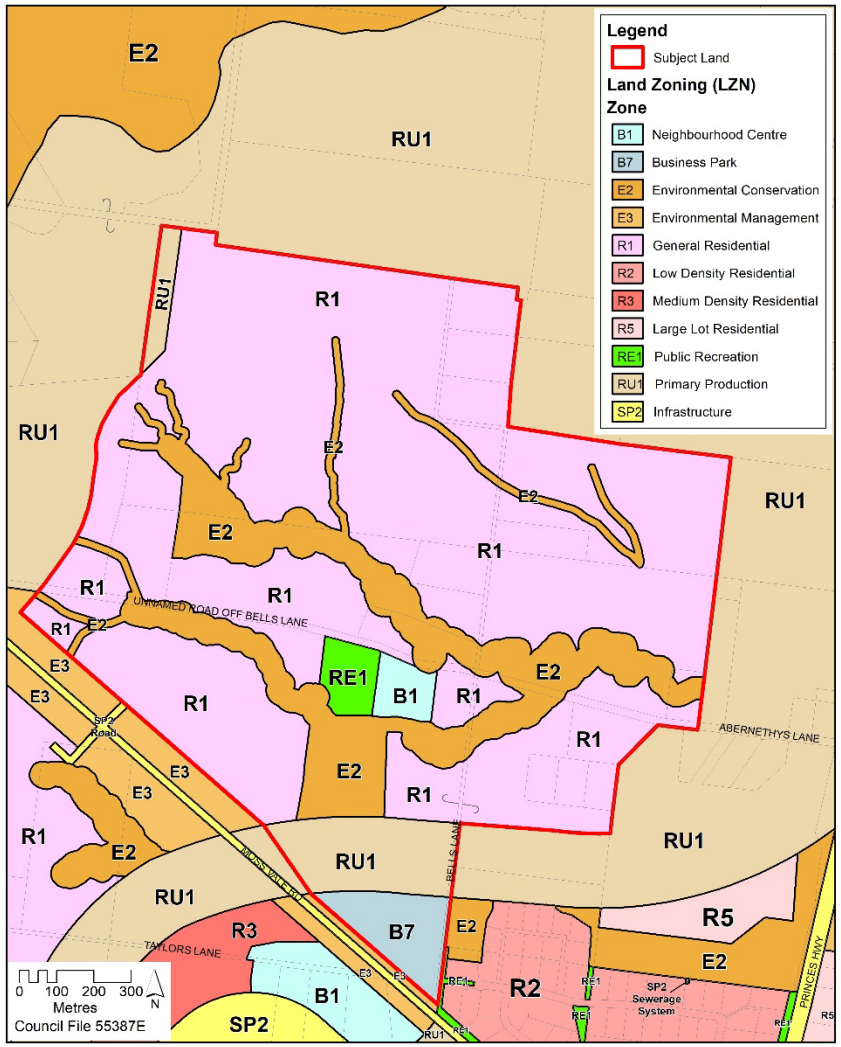
# 2b. Overview of URA

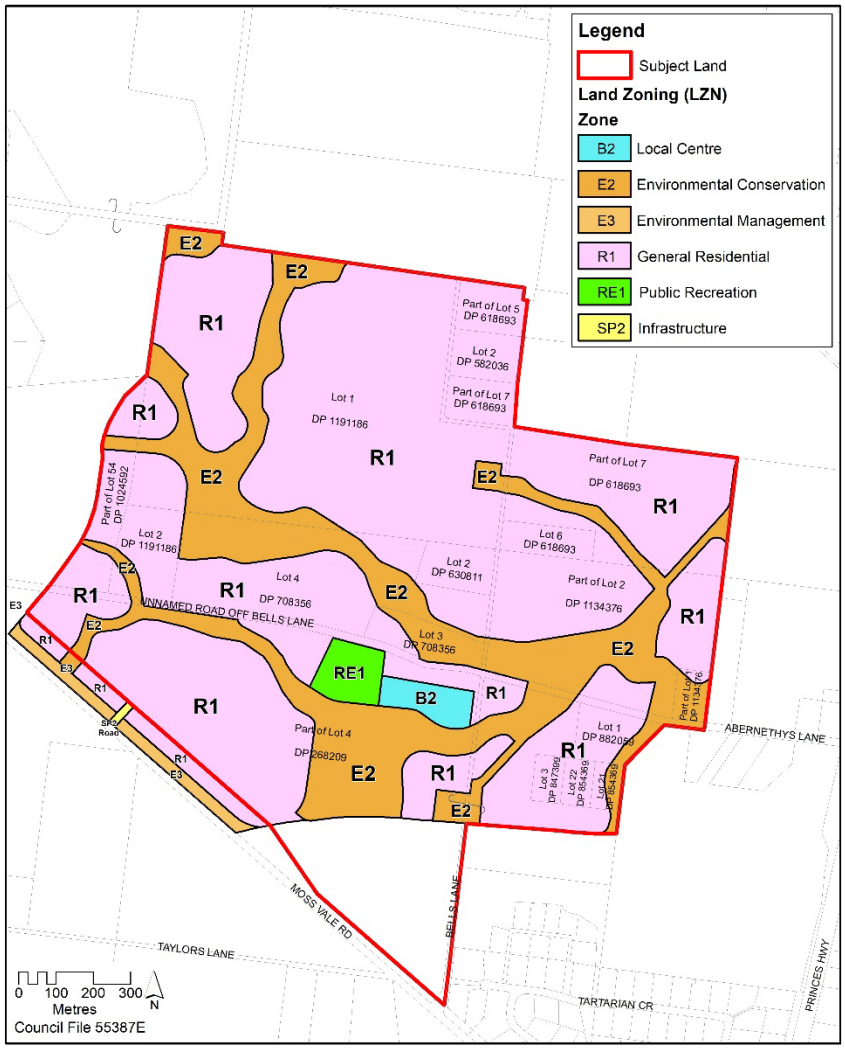



**Current planning controls:**

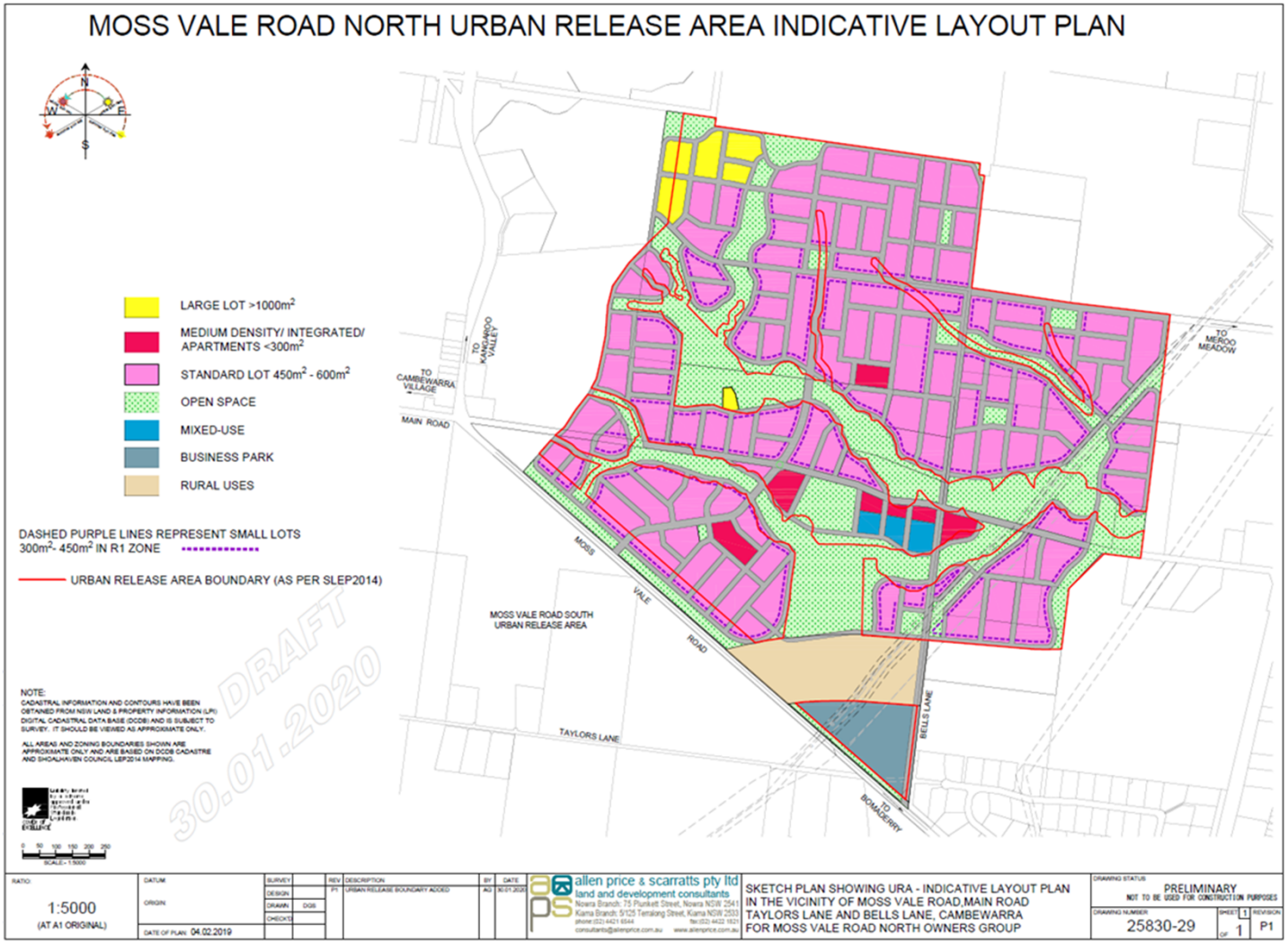
- Low density residential outcome (1,300 dwellings)
- Local retail centre
- Open Space
- Environmental zones

# 2c. Proposed Changes

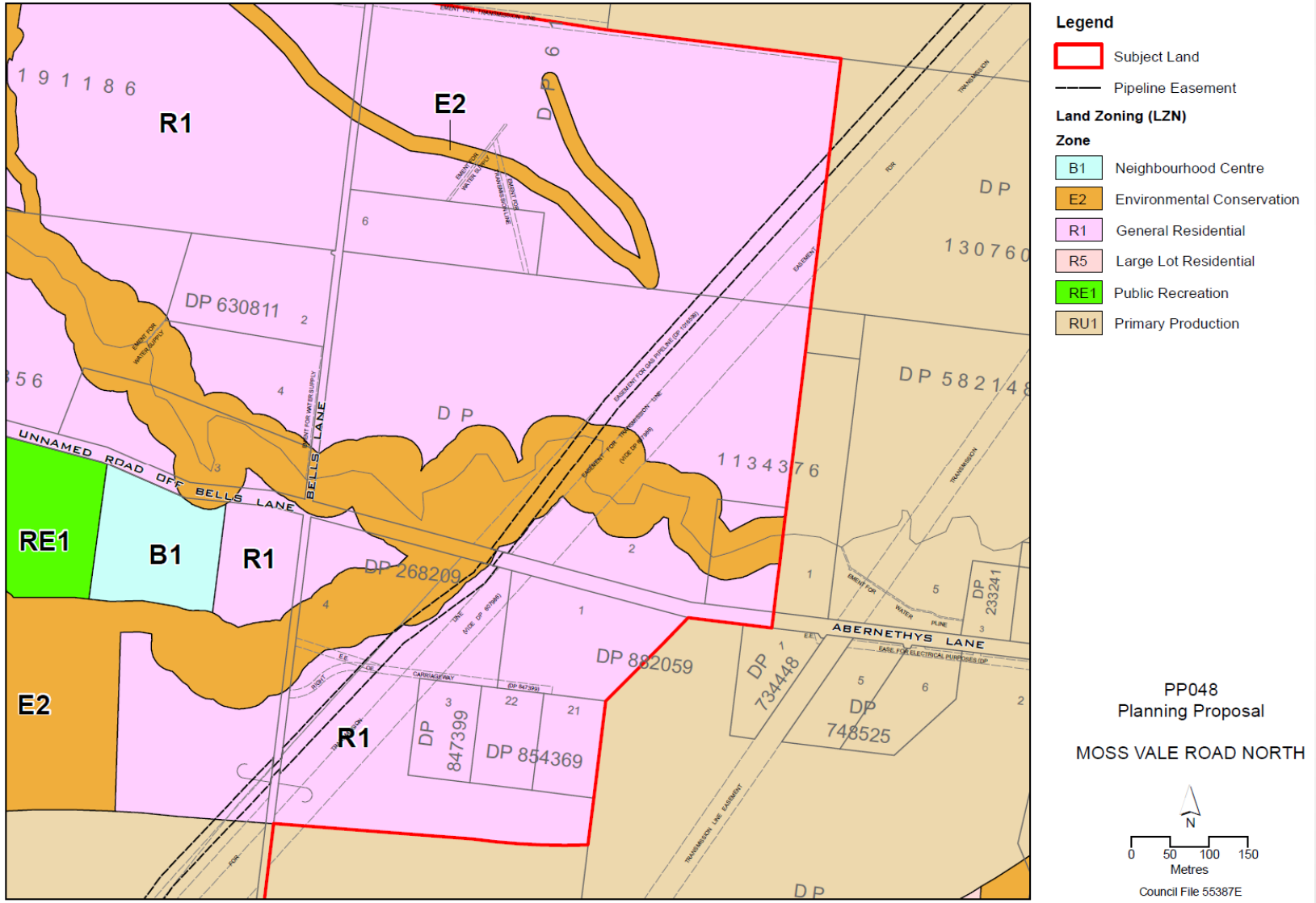


# 2d. Proposed Changes

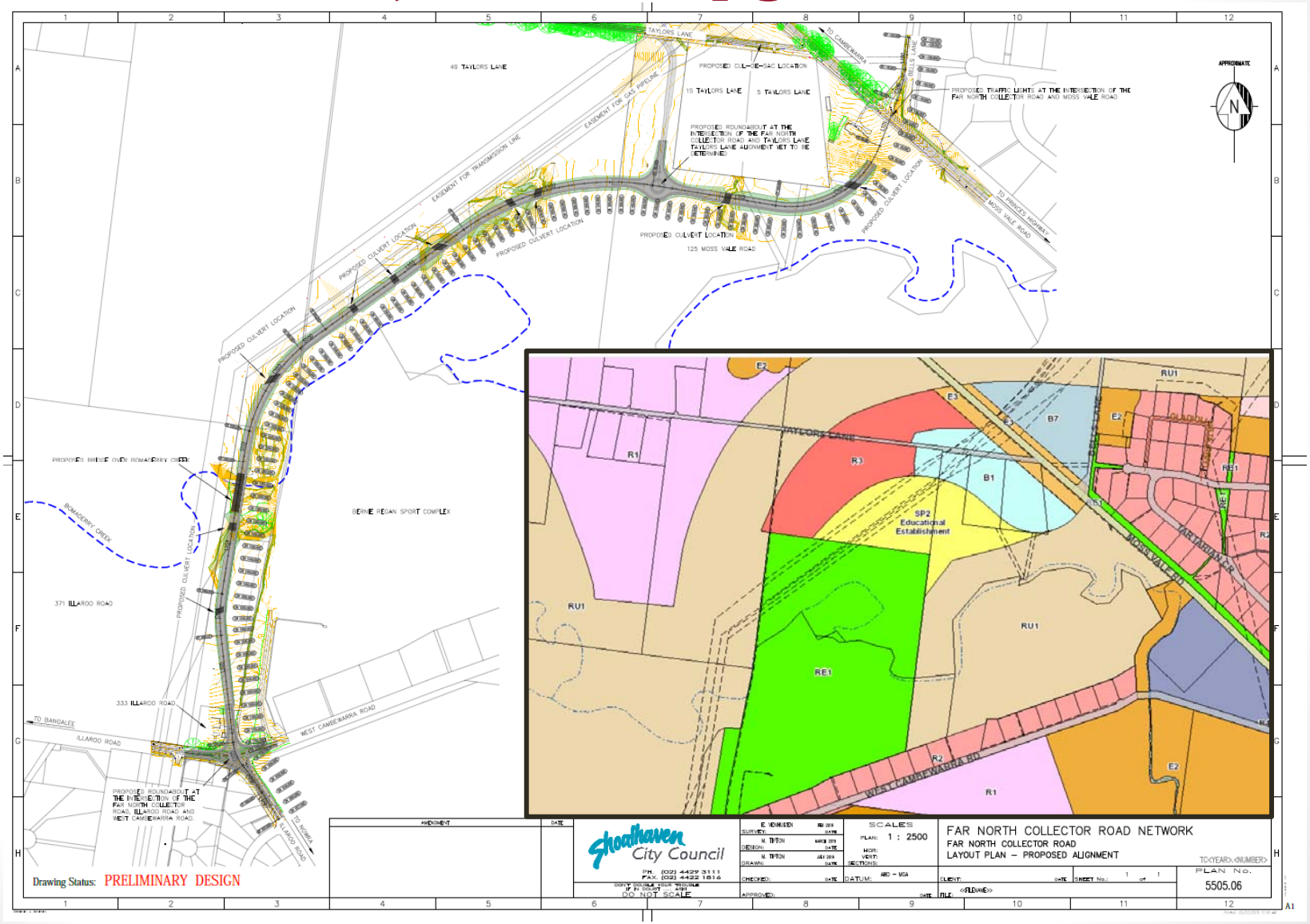


# 2e. Evaluating Proposed Changes

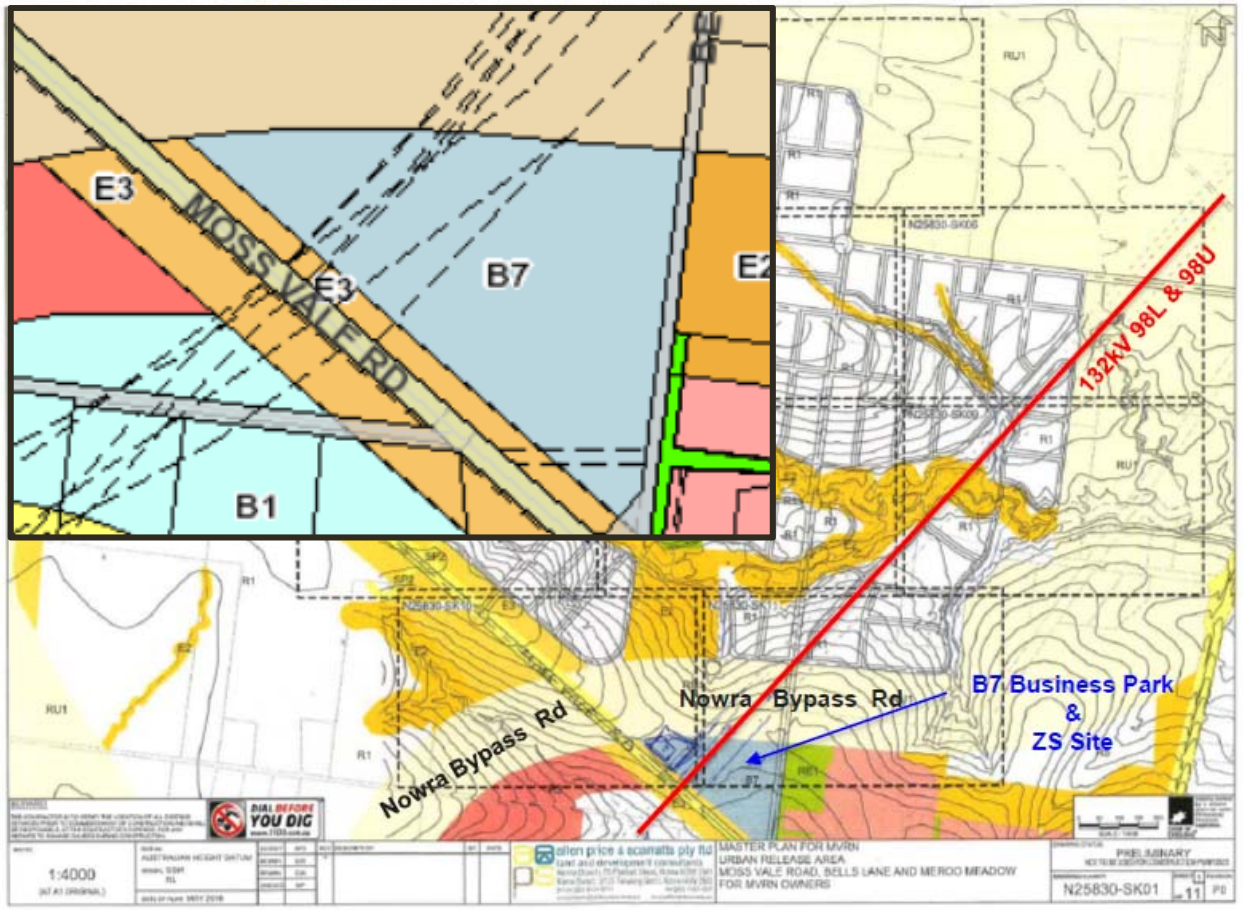



Planning/Graphics/Projects/PlanningProposal/PP048_URA_MossValeRoad_North/WorkingMaps/RiskAssessmentInset_PP048_20200218.mxd

# 2f. URA – Major Road upgrades

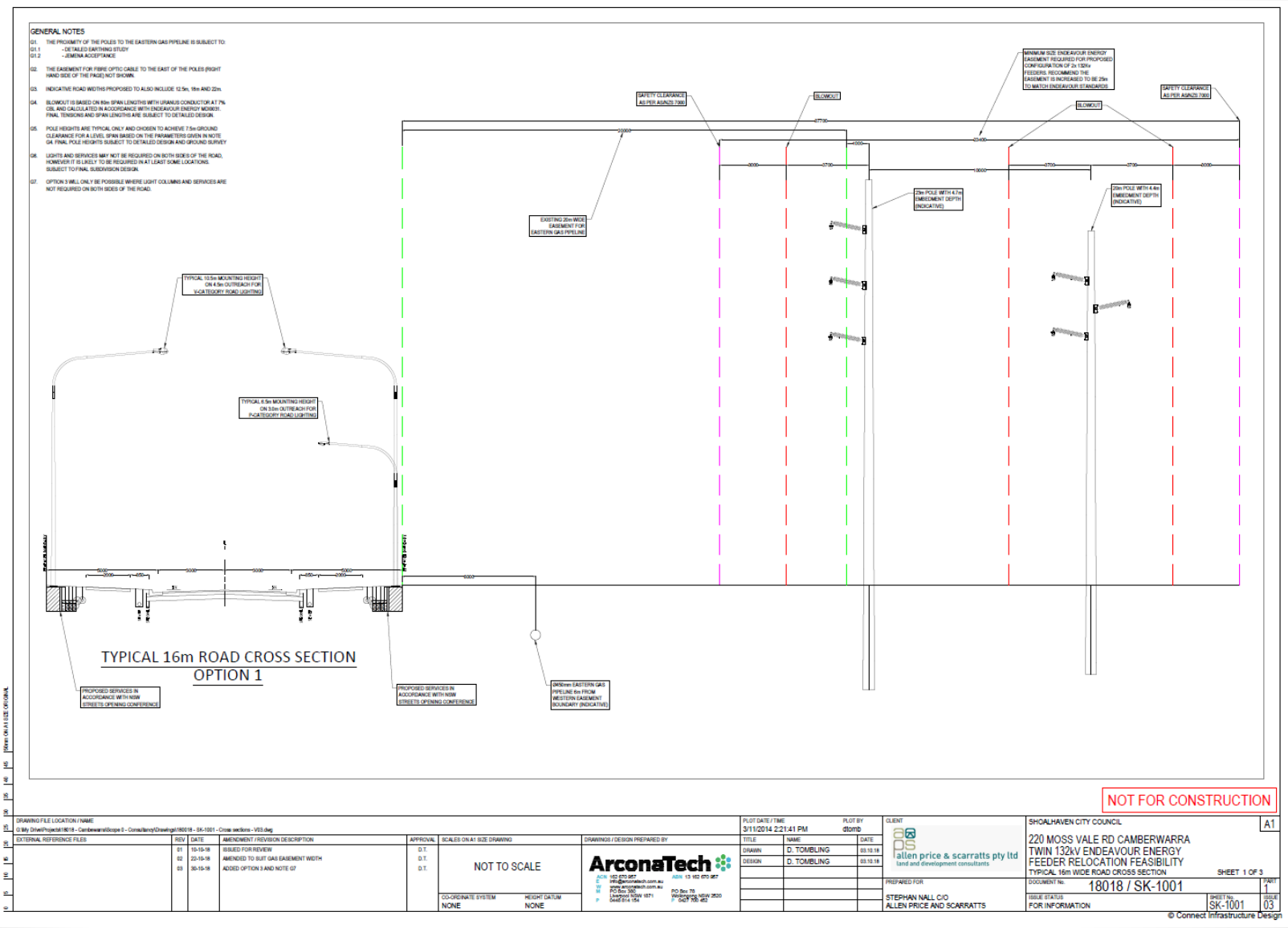


# 2g. URA – New Sub-station

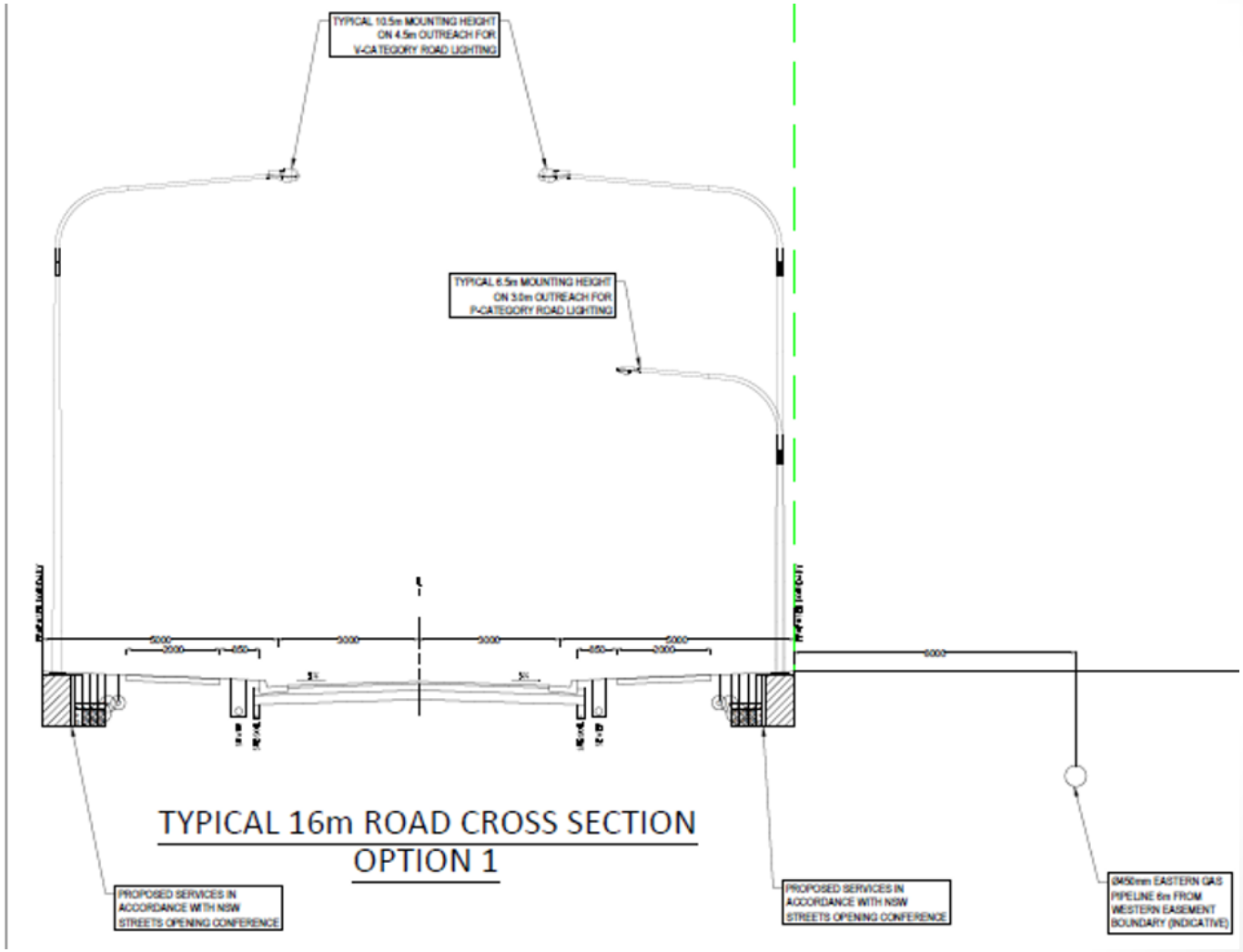


# 2h. URA – Local Roads – Poles & Wires

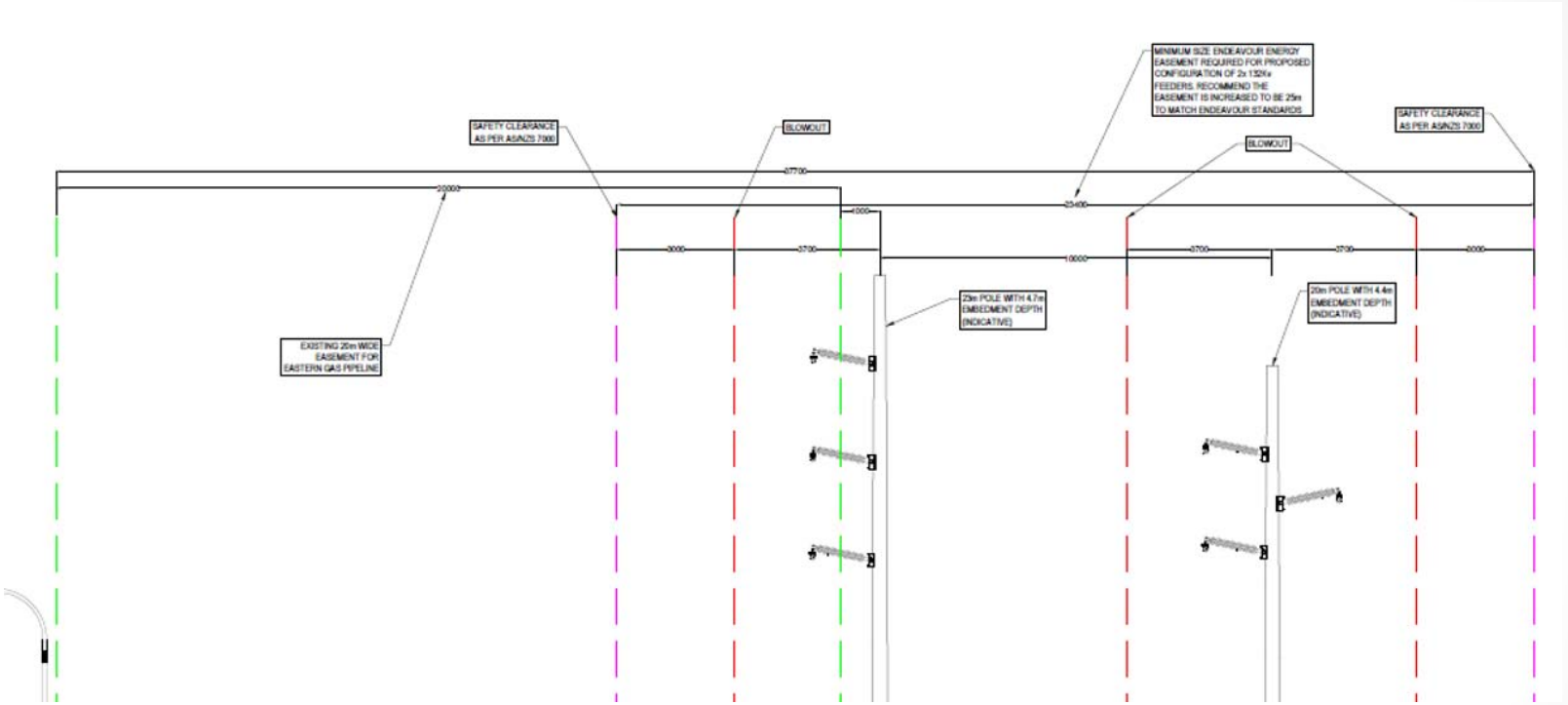
# 2i. URA – Local Roads – Poles & Wires



# 2j. URA – Local Roads – Poles & Wires

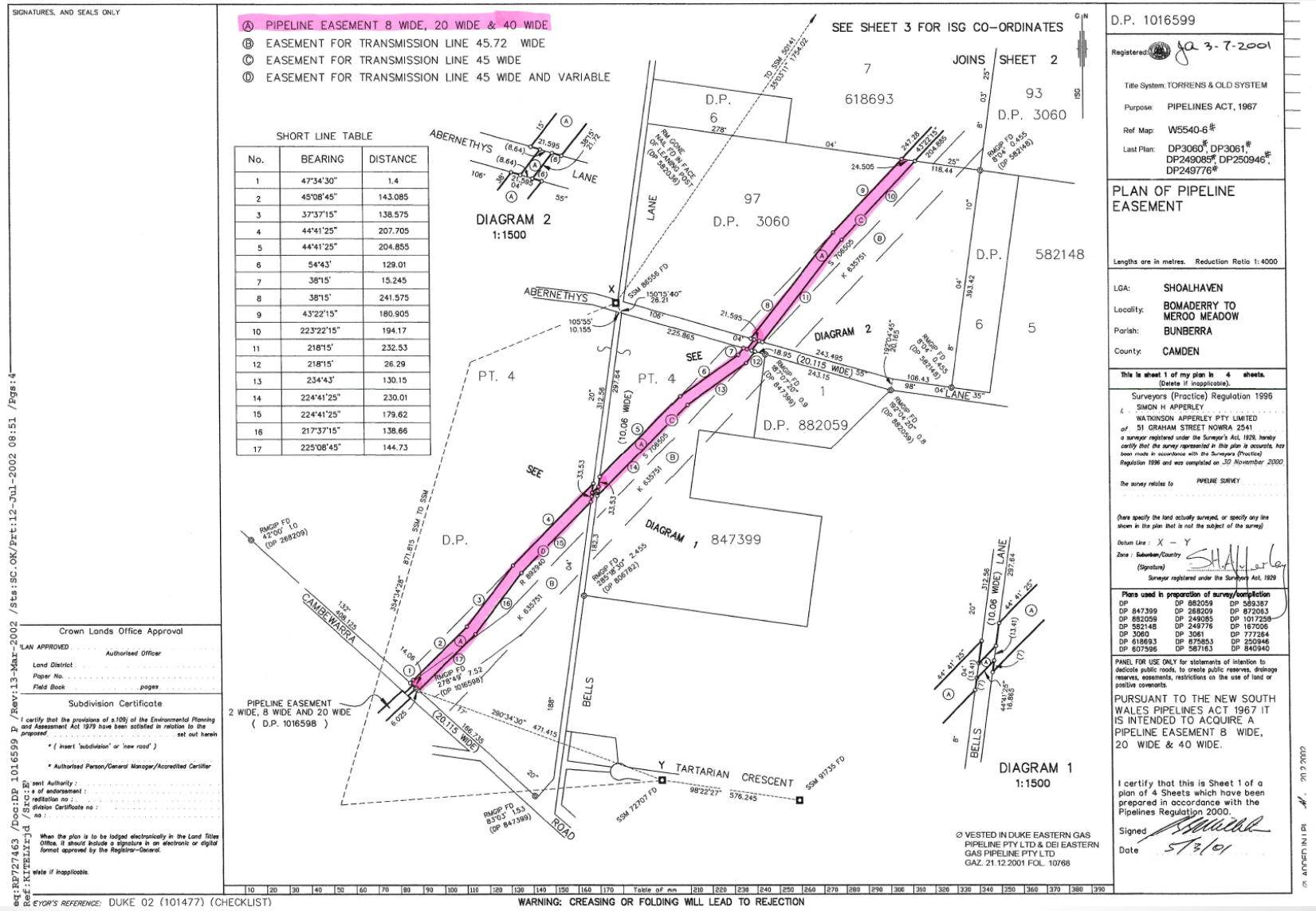


# 2k. URA – Local Roads – Poles & Wires



# 3a. Current Pipeline Operations

# 3b. Pipeline Easement



# 3c. Safe operation

https://en.wikipedia.org/wiki/List_of_pipeline_accidents

https://www.youtube.com/Oil Pipeline rupture Burnaby BC (2007)

https://www.youtube.com/San Bruno California (2010)

https://www.youtube.com/watch?v=qActX_H5Cgs (2015)

# 3d. Jemena Requirements

16th July 2019

Campbelltown City Council
70 Central Ave
Oran Park NSW 2570

Attention: David Timmins
Senior Town Planner
Campbelltown City Council

Dear David

**Re: Development Application DA130/2019/DA-SL**
**247 Jamboree Avenue Denham Court NSW**
**144 bedroom seniors living development (residential care facility)**

Eastern Gas Pipeline
Joint Venture

Jemena Eastern Gas Pipeline (1) Pty Ltd
ABN 15 068 570 847
Jemena Eastern Gas Pipeline (2) Pty Ltd
ABN 77 006 919 115

Level 16, 567 Collins Street
Melbourne, VIC 3000
PO Box 16182
Melbourne, VIC 3000
T +61 3 9173 7000
F +61 3 9173 7516
www.jemena.com.au

# 4a. Pipeline Data Validation

**AS2885.6 Safety Management Study – Validation Workshop & Risk Assessment**

**Summary of SMS & Pipeline System**

**Table 1A: SMS Information**

| | | |
|---|---|---|
| SMS | Title | **Change of Land Use & Encroachment** |
| Stakeholders | Asset Owner | Jemena |
| | Operator | Jemena |
| | Maintenance | Jemena |
| | Regulator | NSW Department of Planning & Investment |
| | | |
| Validation Workshop | Date | 17-Mar-20 |
| | Venue | NSW DPIE Office Wollongong |
| | | |
| Workshop Team | Participants | Per attendance sheet (refer Worksheet Tab 2 Attendees) |
| | Chair | Jeff Jones (pda) |

* Refer & populate SMS.xls Tabs 1 - 5

# 5a. Risk Assessment Methodology

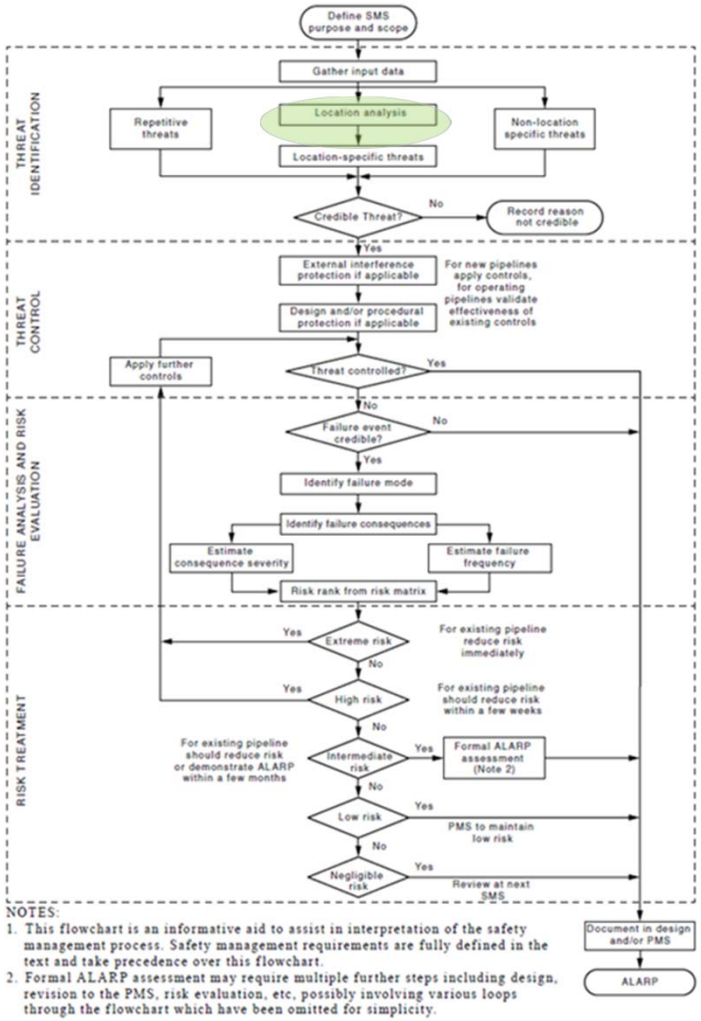



FIGURE A1 SAFETY MANAGEMENT PROCESS FLOWCHART

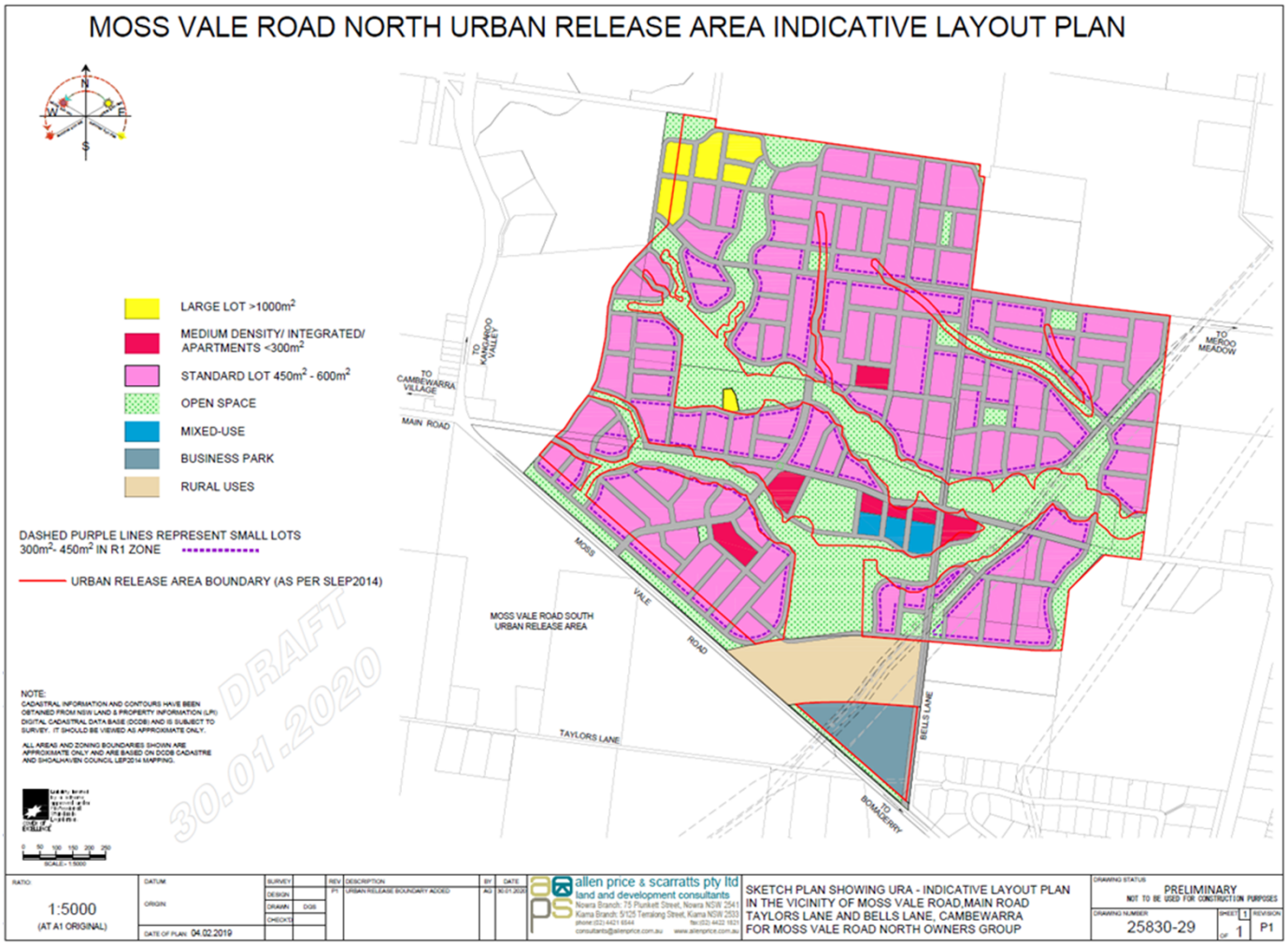
AS2885.6 Figure A1 Pipeline Safety Management Process

# 5b. Location Class Reiew

**AS2885.6 Clause 2.2 Location Classification**

- Safety of pipelines and pubic is paramount
- determined by assessing the land use within a radius of one MEASUREMENT LENGTH from that point.
- Primary location class - **R1, R2, T1, T2**
- Secondary location class – **S, E, I, HI, CIC, C**
- Location class dictates design requirements;
  - pipeline wall thickness for resistance to penetration
  - depth of cover
  - external interference protection controls
  - Isolation valve spacing
  - pipeline marking
  - retrospective assessment for high consequence areas

# 5c. Location Class - ML



# 5d. Primary Location Class

**Residential (T1) -** Land that is developed for community living or is defined in a local planning instrument as residential or its equivalent. Residential applies where multiple dwellings exist in proximity to each other and dwellings are served by common public utilities. Residential includes areas of land with public infrastructure serving the residential use, e.g. roads, railways, recreational areas, camping grounds/caravan parks, suburban parks, small strip shopping centres. Residential land use may include isolated higher density areas provided they are not more than 10% of the land use within a radius of one MEASUREMENT LENGTH at any point on the pipeline. Land used for other purposes but with similar population density shall be assigned Residential LOCATION CLASS.

**High Density (T2) -** Land that is developed for high density community use or is defined in a local planning instrument as high density or its equivalent. High Density applies where multi-storey development predominates or where large numbers of people congregate in the normal use of the area. High Density includes major sporting and cultural facilities, major retail and business centres (e.g. town centres, shopping malls, hotels and motels) and areas of public infrastructure serving the high-density use (e.g. roads, railways). To assist in determining the LOCATION CLASS boundary between T1 and T2, the T2 LOCATION CLASS contains more than approximately 50 dwellings per hectare.

# 5e. Secondary Location Class

**Sensitive use (S)**

The sensitive use LOCATION CLASS identifies land where the consequences of a FAILURE EVENT may be increased because it is developed for use by sectors of the community who may be unable to protect themselves from the consequences of a pipeline FAILURE EVENT. Sensitive uses are specifically defined in some jurisdictions, but include schools, hospitals, aged care facilities and prisons.

Sensitive use LOCATION CLASS shall be assigned to any section of the PIPELINE SYSTEM where there is a sensitive development within a MEASUREMENT LENGTH.

The design requirements for High Density (T2) shall apply.

NOTE: In sensitive use areas, the societal risk associated with loss of containment is a dominant consideration.

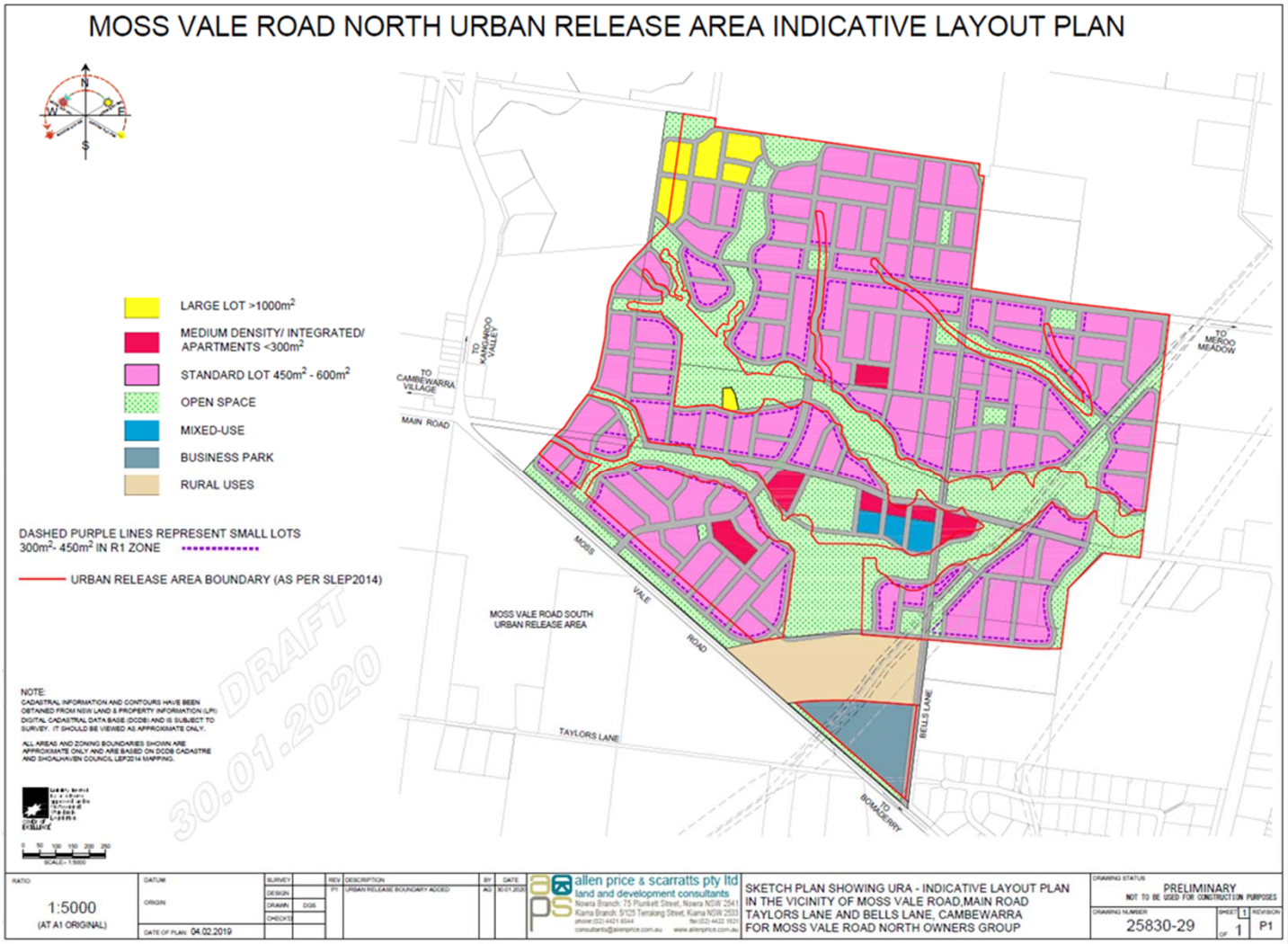
# 5f. Secondary Location Class

| | |
|---|---|
| **(S)** | Sensitive Use …….treat as (T2) |
| **(I)** | Industrial ……treat as (T1) |
| **(HI)** | Heavy Industrial….treat as R2, T1 or T1 |
| **(CIC)** | Common Infrastructure Corridor |
| **(C)** | Crowd |

Location classes S, CIC, I, HI and C are subclasses that may occur in any primary location class. The affected length is generally less than the length of the primary location class.

Where the land use through which the pipeline route passes is identified as S, CIC, I, HI or C the requirements of the primary location class (R1, R2, T1, T2) shall be applied together with additional consideration and additional requirements established for the S, CIC, I or C location class

# 5g. Review of Location Class – any change?




* Refer SMS.xls Tab 6

# 6a. SMS Threat Control

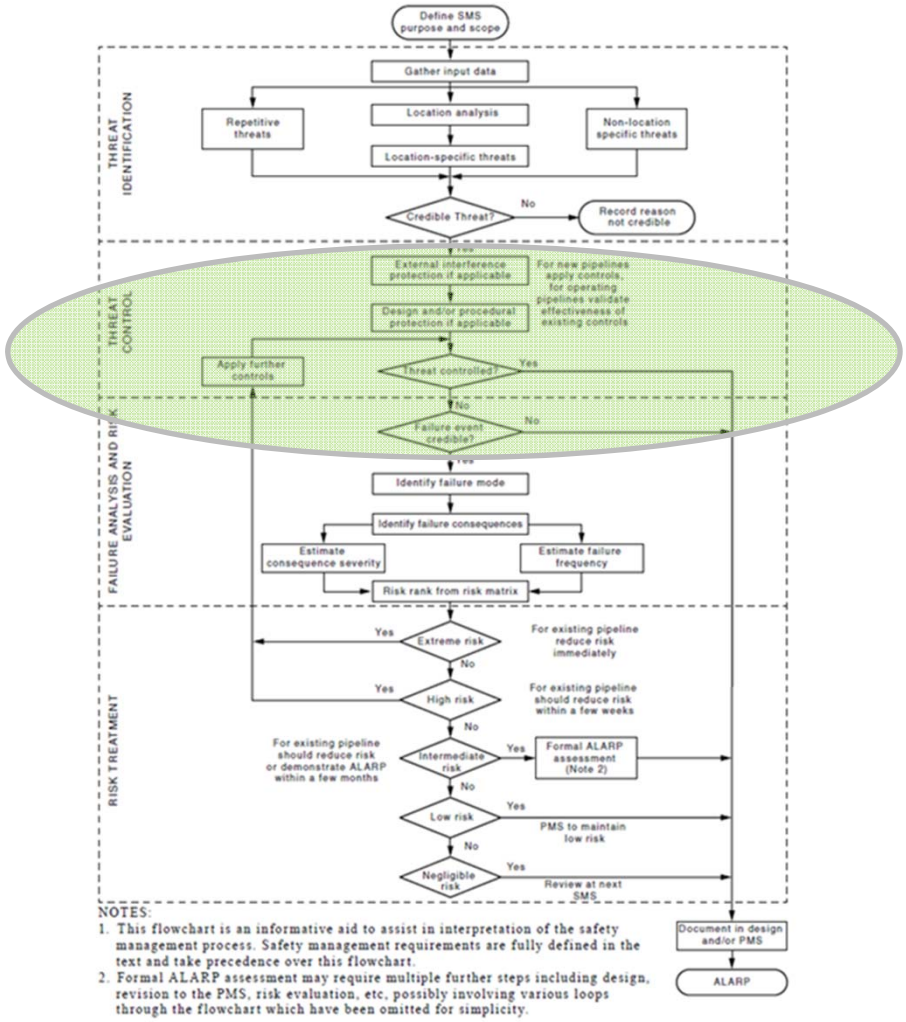



FIGURE A1 SAFETY MANAGEMENT PROCESS FLOWCHART

AS2885.6 Figure A1 Pipeline Safety Management Process

# 6b. Threat Risk Assessment

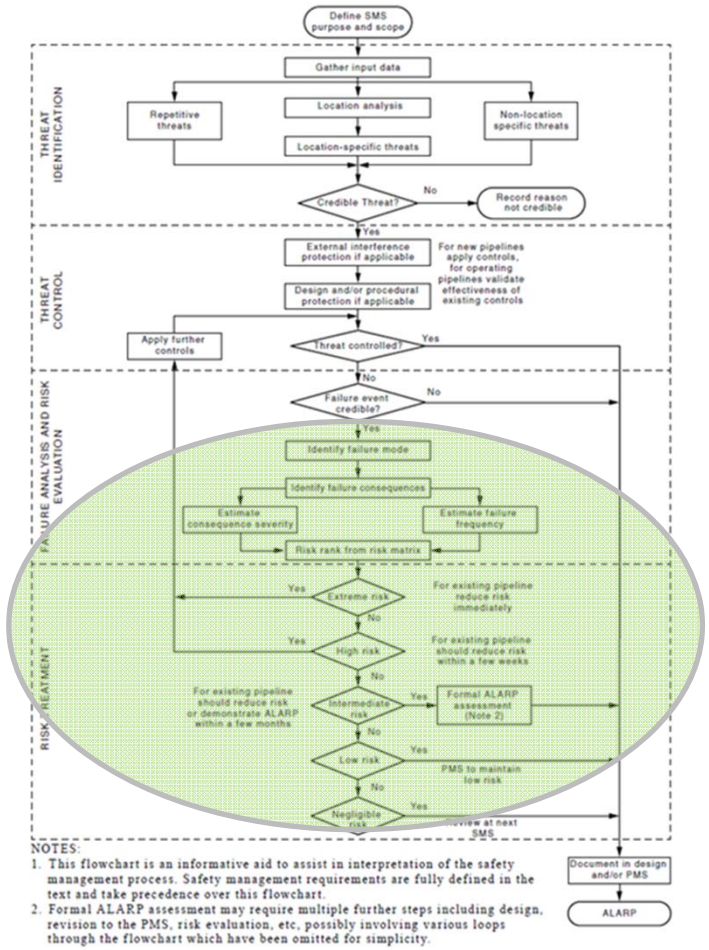



FIGURE A1 SAFETY MANAGEMENT PROCESS FLOWCHART

AS2885.6 Figure A1 Pipeline Safety Management Process

# 6c. Risk Assessment Methodology

**TABLE 3.1**

**SEVERITY CLASSES**

| Dimension | Severity class | | | | |
|---|---|---|---|---|---|
| | Catastrophic | Major | Severe | Minor | Trivial |
| | Measures of severity | | | | |
| People | Multiple fatalities result | One or two fatalities; or several people with life-threatening injuries | Injury or illness requiring hospital treatment | Injuries requiring first aid treatment | Minimal impact on health and safety |
| Supply (see Note) | Widespread or significant societal impact, such as complete loss of supply to a major city for an extended time (more than a few days) | Widespread societal impact such as loss of supply to a major city for a short time (hours to days) or to a localized area for a longer time | Localized societal impact or short-term supply interruption (hours) | Interruption or restriction of supply but shortfall met from other sources | No loss or restriction of pipeline supply |
| Environment | Impact widespread; viability of ecosystems or species affected; or permanent major changes | Major impact well outside PIPELINE CORRIDOR or site; or long-term severe effects; or rectification difficult | Localized impact, substantially rectified within a year or so | Impact very localized and very short-term (weeks), minimal rectification | No effect; or minor impact rectified rapidly (days) with negligible residual effect |

NOTE: Appendix G provides guidance on assessment of consequence severities.

# 6d. Risk Assessment Methodology

**TABLE 3.2**

**FREQUENCY CLASSES**

| Frequency class | Frequency description |
|---|---|
| Frequent | Expected to occur once per year or more |
| Occasional | May occur occasionally in the life of the pipeline |
| Unlikely | Unlikely to occur within the life of the pipeline, but possible |
| Remote | Not anticipated for this pipeline at this location |
| Hypothetical | Theoretically possible but would only occur under extraordinary circumstances |

# 6e. Risk Assessment Methodology

AS2885.1 2012 - Risk Matrix

| CONSEQUENCES | Typical Severity Classes | | Catastrophic | Major | Severe | Minor | Trivial |
|---|---|---|---|---|---|---|---|
| | People | | Multiple fatalities result | Few fatalities, or several people with life-threatening injuries | Injury or illness requiring hospital treatment | Injuries requiring first aid treatment | Minimal impact on health & safety |
| | Supply | | Long term interruption of supply | Prolonged interruption; long term restriction of supply | Short term interruption; prolonged restriction of supply | Short term interruption; restriction of supply but shortfall met from other sources | No impact; no restriction of pipeline supply |
| | Environment NOTE: Significant environmental consequences may occur in locations which are relatively small & isolated | | Effects widespread; viability of ecosystems or species affected; permanent major changes | Major off-site impact; long term severe effects; rectification difficult. | Localised (<1 ha) & short-term (<2 yr) effects, easily rectified. | Effect very localised (<0.1 ha) and very short term (weeks), minimal rectification | No effect; minor on-site effects rectified rapidly with negligible residual effect |
| FREQUENCY | Frequent | Expected to occur once per year or more. | Extreme | Extreme | High | Intermediate | Low |
| | Occasional | May occur occasionally in the life of the pipeline | Extreme | High | Intermediate | Low | Low |
| | Unlikely | Unlikely to occur within the life of the pipeline, but possible. | High | High | Intermediate | Low | Negligible |
| | Remote | Not anticipated for this pipeline at this location. | High | Intermediate | Low | Negligible | Negligible |
| | Hypothetical | Theoretically possible, but has never occurred on a similar pipeline | Intermediate | Low | Negligible | Negligible | Negligible |

**TABLE F4**

**RISK MATRIX**

| | Catastrophic | Major | Severe | Minor | Trivial |
|---|---|---|---|---|---|
| **Frequent** | Extreme | Extreme | High | Intermediate | Low |
| **Occasional** | Extreme | High | Intermediate | Low | Low |
| **Unlikely** | High | High | Intermediate | Low | Negligible |
| **Remote** | High | Intermediate | Low | Negligible | Negligible |
| **Hypothetical** | Intermediate | Low | Negligible | Negligible | Negligible |

# 6f. Threat Identification

**AS2885.6 Threat Identification**

The following list presents some of the most commonly identified threats:

(i) External Interference

(ii) Corrosion.

(iii) Natural events.

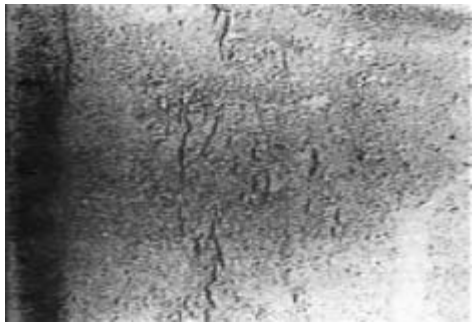
(iv) Operations and maintenance.

(v) Design defects.

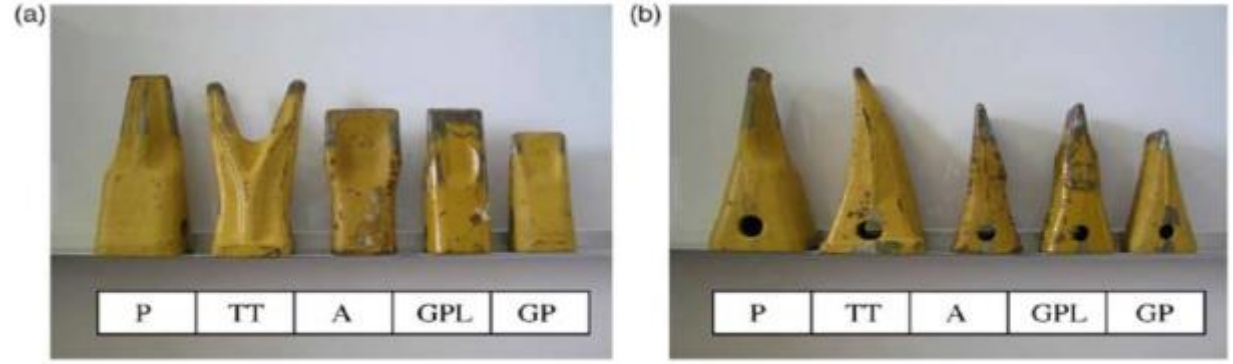
(vi) Material defects.

(vii) Construction defects.

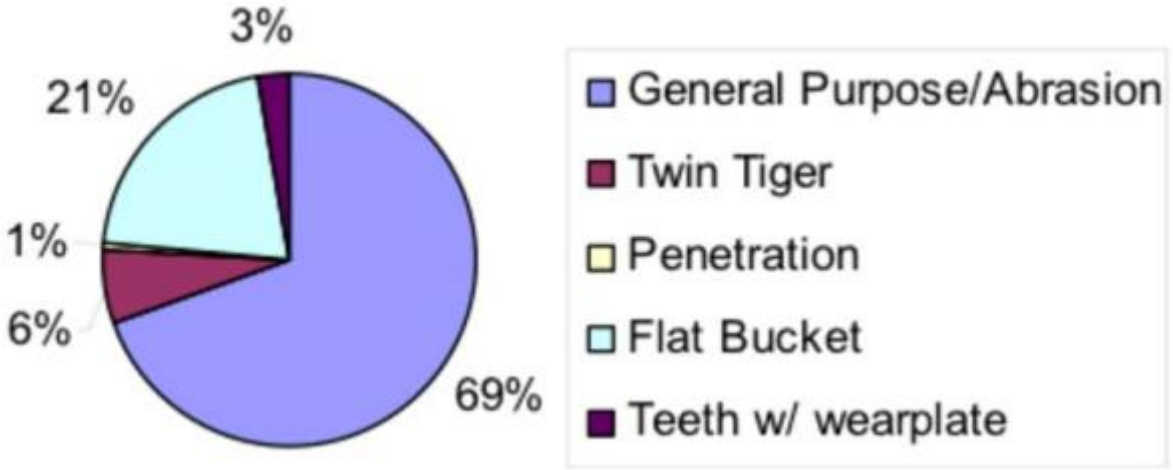
(viii) Intentional damage.

# 6g. Resistance to Penetration




(Front and side views of typical excavator teeth. Image from report Pipeline Resistance to External Interference Phase III, UWA, November 2004.)




Source - https://pipelinesoz.wordpress.com/2011/10/04/penetration-teeth/

# 6h. Resistance to Penetration

| Excavator | GP Teeth | Single Point of TT | Both Points of TT |
|---|---|---|---|
| 5T | No Penetration | No Penetration | No Penetration |
| 10T | No Penetration | No Penetration | No Penetration |
| 15T | No Penetration | No Penetration | No Penetration |
| 20T | No Penetration | No Penetration | No Penetration |
| 25T | No Penetration | No Penetration | No Penetration |
| 30T | No Penetration | No Penetration | No Penetration |
| 35T | No Penetration | Leak | No Penetration |
| 40T | No Penetration | Leak | No Penetration |
| 55T | No Penetration | Leak | No Penetration |

**No Excavator** **with General Purpose teeth can puncture the pipeline**
**A 35 tonne excavator** **with Single Point/Tiger teeth can puncture the pipeline**
**No Excavator** **can push both points of a Tiger tooth into the pipeline**

Example – Source - https://pipelinesoz.wordpress.com/2011/10/04/penetration-teeth/

# 6i. External Interference Protection

## Controls

- Design features
- O&M Procedures
- External Interference Protection

TABLE 5.5.4(A)

EXTERNAL INTERFERENCE PROTECTION—PHYSICAL CONTROLS

| Controls | Methods |
|---|---|
| Separation | Burial<br>Exclusion<br>Barrier |
| Resistance to penetration | Wall thickness<br>Barrier to penetration |

## Evaluation

- Is AS2885.1 5.5.4 minimum satisfied?
- Are the controls effective?
- Is failure still possible?

TABLE 5.5.4(B)

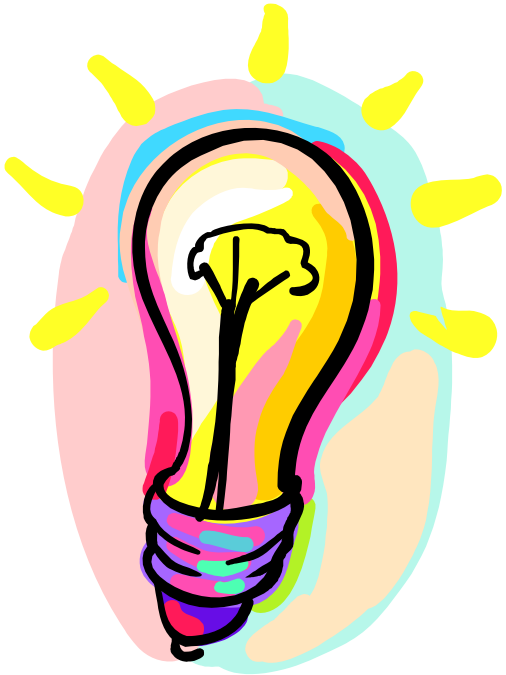
EXTERNAL INTERFERENCE PROTECTION—PROCEDURAL CONTROLS

| Controls | Methods |
|---|---|
| Pipeline awareness | Landowner<br>Third party liaison<br>Community Awareness program<br>One-call service<br>Marking<br>Activity agreements with other entities |
| External interference detection | Planning notification zones<br>Patrolling<br>Remote intrusion monitoring |

## Residual Risk Rating

- Is risk ranking ALARP?

# 6j. Review Existing SMS Threat Register



* SMS Risk Assessment – review current Jemena Threats & control information if impacted by UAP activities

# 7a. New location specific threats

* SMS Risk Assessment – identify potential new Threats & required controls

# 7b. Rank Residual Risks

**Rank from worksheet filter…**

| Risk Management Actions | |
|---|---|
| Extreme: | Modify the threat, the frequency or the consequences so that the risk rank is reduced to 'intermediate' or lower. For an in-service pipeline the risk shall be reduced immediately. |
| High: | Modify the threat, the frequency or the consequences so that the risk rank is reduced to Intermediate or lower. For an in service pipeline the risk shall be reduced as soon as is possible, typically within a timescale of not more than a few weeks. |
| Intermediate: | Repeat threat identification and risk evaluation processes to verify and, where possible, quantify the risk estimation; determine the accuracy and uncertainty of the estimation. Where the risk rank is confirmed to be 'intermediate', if possible modify the threat, the frequency or the consequence to reduce the risk rank to 'low' or 'negligible'.<br>Where the risk rank can not be reduced to 'low' or 'negligible', action shall be taken to-<br>(a) remove threats, reduce frequencies and/or reduce severity of consequences to the extent practicable; and<br>(b) demonstrate ALARP.<br>For an in-service pipeline the reduction to 'low' or 'negligible' or demonstration of ALARP shall be completed as soon as possible, typically within a timescale of not more than a few months. |
| Low: | Determine the management plan for the threat to prevent occurrence and to monitor changes that could affect the classification. |
| Negligible: | Review at the next review interval. |

* SMS Risk Assessment – record risk assessment and ranking

# 7c. Risk Treatment - Controls

**AS2885.6 Risk treatment during operation**

Risk treatment actions at operating pipeline stage may include one or more of the following:

(a) Installation of modified physical external interference protection methods.

(b) Modification of procedural external interference protection methods in operation.

(c) Specific actions in relation to identified activities (e.g., presence of operating personnel during activities on the easement).

(d) Modification to pipeline marking.

(e) Changes to the isolation plan.

(f) Changes to the design or operation to satisfy the requirements of this Standard when there is a change to the location class of the pipeline.

(g) Specific operational or maintenance procedures.

# 8. Workshop Conclusions

**Parking Lot Items**

1. All items cleared

**Agreed next steps**

- ❑ PDA to issue draft workshop results (as-built ppt, SMS Action Plan) to SCC & Jemena
- ❑ SCC to include SMS Workplan action items in planning proposal submission to DPIE

# Thank you to all participants…


# SMS Workshop

## AS2885.6 Preliminary Safety Management Study – Validation Workshop & Risk Assessment
## Location Design Features

| Feature | SMS Section | Comment | SMS Action |
|---|---|---|---|
| Route & easement corridor | SMS Section constrained to segment adjacent to the UAP site, incldluing ML distance upstream & downstream for Location Class assessment. | Jemena hold easement over current landowner title & council road deeds. | Tenure (Jemena access) of pipeline corridor is to be confirmed as part of URA planning eg 88b mechanism or VPA.<br><br>SCC to ensure pipeline route & measurement length is shown on Indicative Layout Plan and other relevant drawings.. |
| General terrain | | rises NE and flattens out, with surface drainage | URA to prohibit pipeline easement to be used for drainage flows<br><br>URA to consider zoning of pipeline corridor for community access and passive protection eg walkways, bike paths, limited landscaping. |
| Maintenance & Repair Access | | current access via locked landowner gates | Access arrangement to be confirmed with Jemena. |
| Pigging Sections / Launchers | | unaffected | |
| Existing Location Class | | Current primary = R2 | Refer to Worksheet 6 |
| Potential Release (for Threat Consequence) | | potential ignited major gas leak through 50mm penetration hole from largest credible threat | Consider disclosure mechanism of pipeline to future developers, landowners & other stakeholders.<br><br>Jemena to advise noise levels associated with ERP or planned blowdown from adjacent valve site. |
| Isolation ability | | Upstream & downstream SCADA MLV's. | |
| Depth of Cover | | as-constructed minimum 1m. Recent pot-pole examples. | |
| Road & Creek Crossings | | Section does include existing crossings. Future roads also proposed in URA. | All road crossings will require Jemena approval of Council road upgrade design. Ref AS2885 & Jemena Guideline.<br><br>Jemena to provide typical DBYD response information to inform council & URA of requirements.. |
| Special Crossings | | URA will require utility connections across easement. Endeavour Energy may require crossings depending upon final sub-station location. | Council to investigate best practise opportunities for URA to include provision for common utility infrastructure crossings. |

**AS2885.6 Preliminary Safety Management Study – Validation Workshop & Risk Assessment**

Current Land Use

| Person 1 | | | | Workshop Team | | Person 2 | | Workshop Team | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Section | | KP | | Section Description | Predominant Land Use | Secondary Land Uses | As-built Alignment | | Location Class | | | | Review of Controls Required? | Comment | Review HC Assessment? | Comment |
| | | | | | | | | | Primary | | Secondary | | | | | |
| Old | New | From | To | | | | Grade | Thickness | Current | Change | Current | Change | | | | |
| | | 648.5 | 650.0 | Pipeline section adjacent to URA | Proposed low to medium density residential developments | | | | R2 | T1 | | | yes | Confirm physical & procedural controls required to meet T1 | Yes | |
| | | | | | | Small section (assumed less than 10%) high density & commercial. | | | | T1 | | | yes | Confirm physical & procedural controls required to meet T1 | Yes | ALARP assessment has been previously completed by Jemena and is based on the largest credible threat of HDD resulting in 50mm hole size<br>1. no-rupture pipe is satisfied (150% threat length < CDL)<br>2. Maximum energy release for T2 is satisfied |
| | | | | | | Possible application for child-care centres, aged care etc | | | | | | S | yes | Confirm physical & procedural controls required to meet T2 | Yes | |
| | | | | | | Potential inclusion of playing fields etc resulting in Crowds | | | | | | C | No | Covered by T2 above | | |

**Risk Assessment:** Propsoed Moss Vale URA adjacent to existing Jemena EGP

**As per AS2885.6 - 2018 Section 3.2**

**Safety Management Process as per AS2885.6 - 2018 Section 3.3**

| Threat | | Threat Identification | | | | | | | Threat Control | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | LS/NLS | Category | Source | Description (cause of harm, what/how) | Potential Impact/s (for Failure analysis) | Dimension | Credible? | Reason | Key Design Control | EIP Applicable? | Physical Controls | Procedural Controls | | Minimum Satisfied? | Other Controls | Threat Controlled? |
| 1 | LS | External Interference | Loading over pipeline | Construction equipment, laydown area etc. | ovality of pipeline, requiring future repair | Supply | Yes | | Material / Wall thickness | | | | | | 1. URA will include location of pipeline and requirement for DA compliance with Jemena Land Crossing Agreement. | Yes |
| 2 | LS | External Interference | Excavation | Earth moving, Foundations etc | contact with pipeline if excavate in wrong location, resulting in coating damage or penetration with ignited loss of containment | All | Yes | | Material / Wall thickness | Yes | Separation - Burial | Resistance - Wall thickness | EID - Patrolling | Aware - Pipeline Marking | Yes | 1. URA to establish protocol (ref Jemena Guidelines for working on or near Easement) for construction focused SMS to be held with developers involved in construction adjacent to easement. | Yes |
| 3 | LS | External Interference | Utilities Crossings | HDD activity could go wrong and across pipeline | contact with pipeline and resultant coating damage or penetration hole with loss of containment which could ignite | All | Yes | | Material / Wall thickness | Yes | Separation - Burial | Resistance - Wall thickness | EID - Patrolling | Aware - Pipeline Marking | Yes | 1. URA to establish protocol (ref Jemena Guidelines for working on or near Easement) for construction focused SMS to be held with developers involved in construction adjacent to easement. | Yes |
| 4 | LS | External Interference | Water & Sewer Tie-ins | Major crossing of pipeline required, requiring excavation and pipeline interface works. | Contact with pipeline if excavate in wrong location, resulting in coating damage or penetration with ignited loss of containment | All | Yes | | Material / Wall thickness | Yes | Separation - Burial | Resistance - Wall thickness | EID - Patrolling | Aware - Pipeline Marking | Yes | 1. SCC to provide high-level concept plan for Jemena consideration and design approvals | Yes |
| 5 | LS | Corrosion | New Sub-station | Stray currents from sub-station could impact CP effectiveness and electrical safety of pipeline workers | Reduced CP effectiveness can lead to external corrosion and potential failure of pipeline, requiring pipeline repair. | Supply | Yes | | | | | | | | 1. Sub-station design will include confirmation of no stray current or electrolysis impact to CP effectiveness.<br>2. Low frequency induction study is required for pole asset relocation parallel to pipeline easement. | Yes |
| 6 | LS | Operations and maintenance | New Sub-station | Transfer voltages from sub-station earthing faults to pipeline discharge | Earthing issues could lead to personnel safety incidents | People | Yes | | | | | | | | 1. Earthing study to be undertaken as part of Endeavour Energy design process<br>2. Electrical hazards study to ensure safety of pipeline O&M (ref AS4853) | Yes |

**AS2885.6 Safety Management Study – Validation Workshop & Risk Assessment**
**SMS Work Plan -** agreed actions to be entered in Licensee SMS Action Register

| Item | SMS Workshop Item | Proposed Action | Accountable | Due Date |
|---|---|---|---|---|
| **WS3. Location Features** | | | | |
| 1 | Pipeline easement corridor | Tenure (Jemena access) of pipeline corridor is to be confirmed as part of URA planning eg 88b mechanism or VPA. | SCC | Planning Proposal |
| 2 | | SCC to ensure pipeline route & measurement length is shown on Indicative Layout Plan and other relevant drawings. | SCC | Input into Planning Proposal |
| 3 | General terrain | URA to prohibit pipeline easement to be used for drainage flows. | SCC | DA condition |
| 4 | Easement O&M Access | URA to consider the appropriate zoning of pipeline corridor for community access and pipeline passive protection eg walkways, bike paths, limited landscaping. | SCC | Planning Proposal |
| 5 | | Easement access arrangement to be confirmed with Jemena. | SCC | Input into Planning Proposal |
| 6 | Potential release consequences | Consider disclosure mechanism of inherent pipeline hazard to future developers, landowners & other stakeholders. | SCC | Planning Proposal |
| 7 | Isolation ability | Jemena to advise noise levels associated with ERP or planned blowdown from adjacent isolation valve site, for SCC to determine if potential noise emission requires consideration in URA. | Jemena | Input into Planning Proposal |
| 8 | Road Crossings | All road crossings will require Jemena approval of Council road upgrade design. Ref AS2885 & Jemena Guideline. | SCC | DA condition |
| 9 | Utility Crossings | Jemena to provide typical DBYD response information to inform council & URA of 3rd party activity requirements.. | Jemena | Input into Planning Proposal |
| 10 | | Council to investigate best practise opportunities for URA to include provision for common utility infrastructure crossings. | SCC | Input into Planning Proposal |
| **WS6. Location Class Review - Review change of land use from URA** | | | | |
| 11 | Proposed low to medium density residential developments | Recognise T1 primary LC. Confirm physical & procedural controls required to meet T1 design requirements. | Jemena | DA approval |
| 12 | Small section (assumed less than 10%) high density & commercial development | Confirm proposed retail & high-density residential is less than 10% in ML area | Jemena | Input into Planning Proposal |
| 13 | Possible application for child-care centres, aged care etc | Recognise Sensitive secondary LC. Confirm physical & procedural controls required to meet T2 design requirements. | Jemena | DA approval |
| 14 | Potential inclusion of playing fields etc resulting in Crowds | Recognise Crowd secondary LC. | Jemena | DA Approval |
| 15 | High Consequence Assessment | Jemena to confirm (Licensee to approve) High Consequence Assessment is AS2885 compliant for URA Land Use Change | Jemena | Input into Planning Proposal |
| **WS10. Threats - Controlled** | | | | |
| 16 | **Threat #1 - External Interference** Loading over pipeline | URA will include location of pipeline and requirement for DA compliance with Jemena Land Crossing Agreement. | SCC | Input into Planning Proposal |
| 17 | **Threat #2 - External Interference** Excavation impacting pipeline | URA to establish protocol (ref Jemena Guidelines for working on or near Easement) for construction focused SMS to be held with developers involved in construction adjacent to easement. | SCC | Input into Planning Proposal |
| 18 | **Threat #3 - External Interference** Utility crossings impacting pipeline | URA to establish protocol (ref Jemena Guidelines for working on or near Easement) for construction focused SMS to be held with developers involved in construction adjacent to easement. | SCC | Input into Planning Proposal |
| 19 | **Threat #4 - External Interference** Major Water/Sewer tie-ins impacting pipeline | SCC to provide high-level concept plan for Jemena consideration and design approvals | SCC | Input into Planning Proposal |
| 20 | **Threat #5 - Corrosion** New sub-station stray currents | Sub-station design will include confirmation of no stray current or electrolysis impact to CP effectiveness. | SCC | DA Condition |
| 21 | | Low frequency induction study is required for pole asset relocation parallel to pipeline easement. | SCC | DA Condition |
| 22 | **Threat #6 - Electrical Hazards** New sub-station earthing | Earthing study to be undertaken as part of Endeavour Energy design process | SCC | DA condition |
| 23 | | Electrical hazards study to ensure safety of pipeline O&M (ref AS4853) | SCC | DA condition |

**Addendum:** Shoalhaven City Council response to PDA's Safety Management Study

Action 1. **Agreed.** Council will ensure the current easement is maintained during any subdivision of the release area and, if necessary, confirmed with a *Section 88B Instrument.* It's likely the land covered by the pipeline corridor will be rezoned *RE1 Public Recreation* and dedicated (through a voluntary planning agreement) to Council as part of the open space network.

Action 2. **Agreed.** Council will ensure the pipeline route and measurement length is identified on indicative layout plans and within the Development Control Plan. Inclusion in the Development Control Plan allows us to apply controls for road and utility crossings, subdivision activities, and consultation with Jemena on development proposals for sensitive uses.

Action 3. **Agreed with recommended modification.** Council's integrated water management strategy for the release area is based on the principle of excluding all drainage infrastructure (storage, conveyance, and discharge) from the easement. This approach will be reflected in subsequent indicative layout plans and the documents coordinating the delivery of the infrastructure - the Development Control Plan and Development Contributions Framework. There will be no need for conditions of development consent.

Action 4. **Agreed.** The land covered by the pipeline corridor will be rezoned *RE1 Public Recreation* and options for low-key passive recreation activities will be examined in the open space masterplan (embellishment to be agreed with Jemena).

Action 5. **Agreed.** Council's future management plan for the open space (once dedicated) will confirm Jemena's access arrangements. Noting (i) improved access will be provided by the new road network and (ii) opportunities for shared access points for Council's maintenance activities.

Action 6. **Agreed with recommended modification.** Council will action disclosure mechanisms following completion of land-use planning work and delivery of planning documents. Council will include a notation on planning certificates (issued under section 10.7 of the *Environmental Planning & Assessment Act 1979*) disclosing the presence of the pipeline and associated hazards. This will be applied to all properties within the measurement length. Council will require developer(s) to disclose the pipeline and associated hazards in any marketing material, potentially secured through a voluntary planning agreement.

Action 7. **Agreed.**

Action 8. **Agreed with recommended modification.** Council will set design standards for road crossings in the Development Control Plan based on AS2885 and Jemena's Guideline. Council will also set a control requiring consultation with Jemena on any proposed crossing. This will negate the need for conditions of development consent.

Action 9. **Agreed with recommended modification.** Council will set design standards for utility crossings in the Development Control Plan based on Jemena's Guideline. Council will also set a control requiring consultation with Jemena on any proposed crossing. This will negate the need for conditions of development consent.

Action 10. **Agreed with recommended modification.** Council will also include the requirement for common utility infrastructure crossings in the Development Control Plan.

Action 11. **Agreed.**

Action 12. **Agreed.**

Action 13. **Agreed with recommended modification.** Council will include controls in the Development Control Plan requiring development proposals for sensitive land uses (to be determined with Jemena) within the measurement length to consult with Jemena.

Action 14. **Agreed.**

Action 15. **Agreed.**

Action 16. **Agreed with recommended modification.** As per Actions 8 and 9.

Action 17. **Agreed with modification.** Council will include controls in the Development Control Plan requiring subdivision proposals adjacent to and crossing the pipeline to conduct a construction focussed Safety Management Study.

Action 18. **Agreed with recommended modification.** Council will include controls in the Development Control Plan requiring proposed road and utility crossings of the pipeline to conduct a construction focussed Safety Management Study.

Action 19. **Agreed with recommended modification:** Council (Shoalwater) will consult Jemena on water/sewer infrastructure during design and construction including the preparation of a construction focussed Safety Management Study.

Action 20. **Agreed with recommended modification:** Endeavour Energy is responsible organisation.

Action 21. **Agreed with recommended modification:** Endeavour Energy is responsible organisation.

Action 22. **Agreed with recommended modification:** Endeavour Energy is responsible organisation.

Action 23. **Agreed with recommended modification:** Endeavour Energy is responsible organisation.