Land use and proposed Western Outer Ring Main (WORM) high pressure gas pipeline.

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APA are proposing a High Pressure Gas Pipeline (HPGP) between Plumpton and Wollert, in Victoria. The approximately 51km long pipeline will address a key capacity constraint in the Victorian Transmission System (VTS) by providing a new high pressure connection between existing sources of natural gas supply in the north and east, with those in the west of the State.

High Pressure Gas Pipelines are located in many growth areas in Victoria. As both new and proposed HPGPs increasingly come into closer proximity with urbanising areas (both current and forecast), more parties are asking questions about both pipeline industry terminology and the practical implications of developing land proximate to a HPGP. Terms such as **Pipeline Corridor**, **Measurement Length**, **Land Use Classification**, **Safety Management Study** and **Area of High Consequence** are often quoted.

Each of these terms are explained on the following pages.

Land use and proposed high pressure gas pipelines – Victorian Urban Growth Areas

Existing HPGPs have been incorporated into a number of Precinct Structure Plans (PSP) within the Victorian Planning System with little impact on the ability to develop adjacent land for urban purposes. Recent PSP's include:

- Kororoit PSP
- Plumpton PSP
- Wollert PSP
- Pakenham East PSP

These existing pipelines designed and constructed many years ago were not necessarily designed to be in an urban environment and provide a useful reference for interested parties as to what can occur around other existing or planned pipelines. Typical urban housing, for example, is able to be located abutting the pipeline easement in each of these PSP's. As will be explained, the key areas for new pipeline design is understanding foreseeable land use changes.

How is land use classified?

Pipelines are designed in accordance with Australian Standard AS 2885 Pipelines – Gas and liquid petroleum (AS2885). AS2885 requires APA to take account of the current and reasonably foreseeable land uses along the proposed pipeline corridor, for the design life of the pipeline, as a central input to the pipeline design.

In reviewing reasonably foreseeable land use, APA activities typically include such things as:

- reviewing applicable land zoning;
- reviewing applicable planning scheme provisions;
- reviewing any available longer term land use plans held by State and local government authorities,
- Meeting with State and Local government planning authorities;
- Meeting directly with impacted landowners within the corridor to understand both current land use and any future plans they may hold.

AS2885 sets out land use classifications. The above research underpins what land use classification is applicable to any given area within a proposed pipeline corridor. These land use classifications include:

- R1 – Rural
- R2 – Rural Residential
- T1– Suburban
- T2 – High Density Urban

In addition to the core land use classifications above, AS2885 sets out subclasses including

- I – Industrial
- S – Sensitive

The 'Pipeline Corridor' is the initial area of study for the potential future location of a pipeline. Both the State Government and directly impacted landowners are provided a notice once a corridor of investigation is identified for formal investigation including potential physical surveys.

How are land use classifications used?

A core process to inform the design of the pipeline is a Safety Management Study (SMS). This study uses the above land use classifications applied within the pipeline corridor to inform both direct threats to the pipeline and the consequence of a pipeline failure to adjacent existing and foreseeable land uses. An outcome of this consideration of threat / consequence / likelihood is for the risk of a pipeline rupturing to be designed out or mitigated to as low as reasonably practicable.

What is the Pipeline Measurement Length?

The area of land around the pipeline where APA must consider the existing and reasonably foreseeable land uses for the purpose of pipeline design considerations is referred to as the Measurement Length (ML).

The ML is determined primarily by the Maximum Allowable Operating Pressure (MAOP) and the pipeline diameter.

The ML is the area of consequence in the extremely unlikely event of a full loss of containment of the gas (full-bore rupture of the pipeline) plus the gas being ignited. The ML defines the area where location classes must be identified and the geographical extent of the SMS considerations. There is a misconception that the ML is just the area of consequence in the event of a worse case pipeline failure. This is not strictly true, with the ML more accurately defined as the area where risks associated with the pipeline is assessed and consequently designed out or mitigated to as low as reasonably practical so to minimise any such event from occurring.

The ML is not a 'buffer' in the sense that all land use needs to be kept a distance from the pipeline, it is the area of study and assessment.

How does the Measurement Length impact land use?

A pipelines ML generally does not impact on urban development from occurring around it. This is because the process outlined above requires the proposed pipeline to be designed to respond to the foreseeable land uses. Where there is potential for a proposed pipeline to influence future land uses is in the case of 'Sensitive' land uses.

For proposed pipelines, AS2885 requires the proposed pipeline corridor to either avoid 'Sensitive' land uses or to design for them where they cannot be avoided. Post construction of the pipeline, AS2885 discourages any further 'Sensitive' uses coming into the ML. Similarly, where urbanisation is occurring around an existing HPGP, it is preferable that Sensitive land uses be planned outside of the ML.

Western Outer Ring Main Pipeline Design

The proposed pipeline design, for the vast majority of its proposed length, adopts the design criteria consistent with a T1-Residential location class, regardless of the actual land use classification applicable to any given area. This means the pipeline, along its entire length, is designed as if it were traversing a T1- Residential land use even though, for a small section of the alignment, an R2-Rural Residential location classification is applicable. This means the entire length of the pipeline will satisfy the 'no rupture' requirements of AS 2885 (see later note on this term).

What are Sensitive Uses?

In addition to primary location classification along the route, APA needs to identify existing 'Sensitive' land uses as a key secondary location classification to be considered in the pipeline design process. AS2885 defines a 'Sensitive' land use as one that may increase the consequence of a pipeline failure due to its use by members of the community that may be unable to protect themselves from the consequence of a pipeline failure. AS2885 requires the pipeline alignment and the associated ML to avoid 'Sensitive' land uses in the first instance. If avoidance cannot be achieved, to design the pipeline appropriately. In addition AS2885 seeks to discourage further 'Sensitive' uses from locating within an established ML.

There are examples in Victorian PSP Planning where the discouragement of 'Sensitive' land use has not been applied to the full extent of the ML for an existing HPGP but a lesser area. This situation has arisen on the basis that a full-bore rupture of the pipeline, based on a risk assessment through an SMS, has been found to not be a credible event (such pipelines are referred to as no-rupture pipelines). In these instances, the worst-case credible scenario (such as a puncture of the pipeline for example) can have a significantly reduced area of consequence and it is this area (the consequence area) where Sensitive land uses are discouraged from locating post construction.

Whilst the WORM Pipeline is designed on a T1 location classification basis and is a no-rupture design, any reduced area of interest (less than the ML) for 'Sensitive' uses would be determined on a case by case basis and would be dependent on an SMS being undertaken at the time of any future land classification change or introduction of 'Sensitive' use into the ML. There are many variables and land use design responses that an SMS can consider to see what 'Sensitive' uses can be located within the ML.

Continued overleaf

APA's position is that the land uses listed below, as defined in the Victorian Planning Provisions, should be located outside of the ML on account of being 'Sensitive':

- Aged Care Facilities;
- Retirement villages;
- Child care / family day care centres;
- Cinema based entertainment facility;
- Schools or other educational establishments;
- Prisons / corrective institutions;
- Hospitals and medical centres;
- Place of assembly or worship; and
- Higher density residential uses (above 50 dwellings per hectare).

Conclusion

The onus is on APA to design proposed pipelines to account for existing and foreseeable land uses. This is not a science. Whilst new pipelines and their associated ML's will not sterilise land for urban development purposes, it may influence the ability to establish 'Sensitive' uses within it after the pipeline has been constructed. A case-by-case assessment of any proposed 'Sensitive' uses or broader Land Use Classification change within the ML of the WORM Pipeline, a no-rupture design based on a T1 location classification, would be required at the time of their consideration. If such an outcome cannot achieve an acceptable management of risk, as evidenced through an SMS process, APA may resist such a change of land use from being permitted by planning authorities.

If you have an interest in either existing or potential future 'Sensitive' land uses or development generally, you are encouraged to contact APA to discuss your plans in more detail.

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