



**Investigations of
land use around
pipelines to guide
initial location
classification under
AS 2885 guideline**

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1 Introduction

Transmission pipelines have long operational lives, in excess of 40 years, and the environments around them change over time. These changes are likely to have effects on a pipeline. In the short term, change will be associated with increased construction activity and its associated risk, in the long term change may alter the risk profile of a pipeline. This is particularly true on the urban fringe of towns and cities where population growth and housing pressures lead to increasing expansion of urban boundaries and the transformation of rural and semi-rural land into suburban and urban environments containing residential, commercial and industrial communities.

Under Part 1 of the Australian Standard for gas and liquid petroleum pipelines, AS 2885, a pipeline licensee must, at the time of construction, design a pipeline to have due consideration of the risks to the pipeline from the surrounding environment and the potential management of consequences associated from a pipeline failure. Due consideration of the risks is achieved through the conducting of a safety management study (SMS).

AS 2885 further requires the pipeline licensee to classify the type of wide-ranging geographic and demographic characteristics at all points along the pipeline for a specified distance, the measurement length either side of the pipeline. These characteristics are defined within two categories:

- a Primary Location Classification; and, where necessary,
- a Secondary Location Classification.

A thorough initial investigation should also be taken as an opportunity to build relationships with planning and development stakeholders that can influence future land use around the pipeline. It should be used as an important first step in raising awareness of the pipeline, risk management and the requirements of AS 2885 with relevant stakeholders. Pipeline licensees should note that ongoing engagement with relevant stakeholders is a requirement of AS 2885 Part 3 and the land use investigation can be used to establish the relationships that will be required to do so.

If there is a change in the pipeline location classification, or construction activity is proposed on or adjacent to a pipeline corridor/easement, AS 2885 requires an additional SMS to be undertaken. The SMS should incorporate a location class review, pipeline risk assessment and a review of the possible mitigation measures set out in AS 2885.1 Section 4.7.4. As a location classification changes, the level of pipeline protection required may increase to ensure the risk to persons, property and the environment are minimised.

2 Purpose

The purpose of this guideline is to provide advice to pipeline designers and other stakeholders on the conducting of investigations into land use around pipelines (hereafter called land use investigation), both existing and future, to ensure the best available information is used through the land use investigation to assign location classifications.

The location classifications that are assigned to sections of the pipeline from the information in the land use investigations area are a fundamental input to a pipeline's design parameters and so it is

important that the land use investigations are robust for the long term. The consequences of an inadequate land use investigation can result in significant cost to a pipeline and the community over the lifetime of the pipeline.

AS 2885 Part 1 sets out:

4.2 ROUTE

4.2.1 General

The route of a pipeline shall be selected having regard to public safety, pipeline integrity, environmental impact, and the consequences of escape of fluid.

A new pipeline shall be designed in accordance with the requirements of this Standard –

(a) for the land use existing at the time of design; and

(b) for the future land use that can be reasonably determined by research of public records and consultation with land planning agencies in the jurisdiction through which the pipeline is proposed.

The land use for which the pipeline is designed shall be documented and approved.

For an existing pipeline, changes in land use from those for which the pipeline was designed introduce an obligation for a safety management study of the pipeline and where required, the implementation of design and/or operational changes to comply with the safety obligations of the Standard.

4.2.2 Investigation

A detailed investigation of the route and the environment in which the pipeline is constructed shall be made. The appropriate authorities shall be contacted to obtain details of any known or expected development or encroachment along the route, the location of underground obstructions, pipelines, services and structures and all other pertinent data.

This guideline is specifically targeted at ensuring the pipeline design shall be informed by the best available information pertaining to:

- land use existing at the time of design;
- future land use that can be reasonably determined by research and consultation; and
- known, proposed or expected development or encroachment along the route.

It will not address other elements of the route investigation required under AS 2885 Part 1, including key considerations such as native title, cultural heritage and environmental issues.

It should be noted that this guideline is primarily focussed on the land use investigation required by AS 2885 during pipeline design. AS 2885 also requires ongoing location classification reviews. While much of the information presented in this guideline will be useful to a location classification review, those reviews are more focussed on existing land use rather than future land use as an existing pipeline will base its risk management on current land use only.

3 Persons conducting land use investigations

As for all aspects of AS 2885, it is necessary that pipeline licensees ensure land use investigations are informed and signed off by appropriately qualified and experienced persons.

It is recommended that a multi-disciplinary team is assembled to conduct a land use investigation, bringing together a range of views and expertise to guide the project. In particular, the persons conducting the investigation should be aware of the expertise that may be lacking, so that particular attention can be given to those areas where additional guidance may be necessary.

The complexity of environments that a pipeline will pass through must be understood and accounted for when determining the qualifications and skills required to conduct a thorough land use investigation. Urban environments and their fringes will have more planning issues to be explored and understood than remote regions (which may offer their own complexity in terms of environmental requirements). It is appropriate that all land use investigations have some level of guidance from property and/or planning professionals, with land use investigations in and around urban environments requiring a high level of engagement from professionals with these skill sets.

4 Components of a land use investigation

There are three key components in a land use investigation:

- Desktop review of existing planning systems, land uses and appropriate documents (strategies, policies, zoning controls, etc) in the vicinity of the pipeline;
- Consultation with stakeholders that can improve the understanding developed through the desktop review and provide further insight; and
- Assessment of the information obtained and of the land in the vicinity of the pipeline.

These components are not strictly sequential; it is likely some overlap will occur across all three. Before commencing the land use investigation, a specification document should be prepared, detailing the process to be followed and outcomes to be achieved.

5 Desktop Review

The desktop review focusses on developing an understanding of the existing planning systems and land uses in the vicinity of the pipeline through a review of published information. The information reviewed should cover:

- the planning framework;
- zoning controls and policies;
- existing land uses;
- proposed zoning and policy changes; and
- strategic future plans across Federal, State and local governments.

There are a range of published sources that should be considered when researching current and future land use around a pipeline. These can broadly be categorised into two categories:

- strategic planning documents; and
- regulatory 'control' planning documents.

The exact nature of each will vary across jurisdictions.

5.1 The planning framework

To conduct an effective land use investigation, it is necessary to understand the planning framework in the jurisdiction(s) in which the pipeline is to be located. Relevant aspects of planning frameworks include:

Statutory framework

- the role of State and local government regulations;
- the hierarchy of state, regional and local plans; and
- treatment of pipelines in jurisdictional planning regulations.

Decision makers/influencers

- government stakeholders in planning decisions; (ie councils, statutory planning authorities, referral agencies with directive powers such as the EPA , transport departments, growth area authorities)
- responsibilities of the State Planning Minister, other Ministers and Parliament;
- responsibilities of the Federal Government
- responsibilities of the State Government;
- responsibilities of Local Government in the jurisdiction;
- peak bodies such as local government associations, the Property Council, National Growth Areas Alliance, Urban Development Institute of Australia; and
- major land owners.

There should be particular emphasis on recognising elements of the planning framework that have relevancy in determining future land use.

A clear understanding of the planning framework in the jurisdiction(s) will assist with identifying documents for research and stakeholders for consultation.

As an example, a stakeholder road map will assist in identifying key government/business departments and agencies that have direct influence over future land use, thus enabling design and future consultation to be targeted to appropriate constituent organisations in order to achieve the clearest understanding of potential changes.

5.2 Strategic planning documents

Strategic planning documents are an important source of information for existing and future land use, setting out a vision for future development uses such as:

- areas of urban growth and redevelopment;
- transport/infrastructure corridors;
- business and industrial centres; and
- other areas of interest such as environment corridors etc.

Strategic planning documents are typically long term in vision, with an outlook ranging up to 30 years, setting forward a pathway for development. They are likely to also include short-term and medium-term strategies with information detailing actions and priorities to achieve the overall long-term objective and vision. This is an excellent starting point for understanding the potential land uses identified for a particular area for the future.

It is essential that relevant strategic planning documents are identified and their hierarchy is understood. In a jurisdiction there may be strategic planning documents at varying levels including:

- Commonwealth;
- State or Territory;
- regional;
- local government jurisdiction;
- capital cities or major urban centres;
- industrial centres; and
- development master plans.

Any draft plans available should also be reviewed. These are generally notified in classified advertisements of major newspapers for the area and on the relevant council's website. (Note: It would be prudent to check council's websites monthly for this material as it may not coincide with a pipeline investigation process).

The Council of Australian Governments Reform Council conducted a review of capital city strategic planning systems in 2011¹. This document sets out the purpose of strategic planning systems, their importance and summarises and assesses the strategic planning systems of each capital city in Australia. It is a useful introductory document for those wishing to better understand strategic planning systems.

5.3 Local planning regulations

Local or town planning regulations (also development plans, zoning plans and overlays) define the zoning of each region in the jurisdiction setting out the permitted land uses. This instrument is the primary source of currently anticipated land uses and will often flag future developments at a local level. Detailed understanding of permitted or contemplated land uses is essential to developing an effective land use investigation.

The zoning framework of a local planning regulation typically defines characteristics that are fundamental to performing a location classification under AS 2885:

- population density; permitted land uses; and
- structure or concept plans for future land use and infrastructure.

Land use zone definitions will typically include a qualitative objective which should be documented in the investigation to provide an understanding of land use intentions.

The management of local planning regulations is typically overseen at a local government level. Each State and Territory has high level planning policies that establish a level of consistency across local planning regulations. However, there can be a range of different approaches local governments take to manage particular issues. The role and flexibility of local planning regulations differs across States and this must also be accounted for.

Most pipeline corridors will cross multiple local planning jurisdictions and will need to be cognisant of the differences that exist between local government jurisdictions.

Areas covered by local planning regulations that can increase the potential for location classifications to change over time include zoning for sensitive uses and the permissible density of a block.

5.3.1 Sensitive use

The permissible uses of each zoning type defined in a local planning regulation should be understood clearly. The 'sensitive use' secondary location classification in AS 2885 covers a wide range of uses, some of which, such as aged care facilities, schools, community centres and child care centres, are often encouraged under residential zoning classes.

5.3.2 Permissible density of a block

It is important that the land use investigation record the permissible density of blocks. Many zones allow for a variety of densities within the one zone. Land that is currently rural and used solely for agricultural purposes may be zoned such that it allows sub-division to semi-rural density without public consultation or special approval processes. Similarly, a location that is largely low-density housing may be zoned such that it could evolve to medium-density housing over the life of a pipeline without any planning changes. It is critical to identify minimum lot sizes if stipulated.

¹ <http://www.coagreformcouncil.gov.au/reports/capital-cities/review-capital-city-strategic-planning-systems>

6 Consultation

In addition to published sources of information, consultation and enquiries are essential to achieve the best possible understanding of current and future land uses in an area.

Relevant stakeholders and their responsibilities should be identified and engaged to access detailed understanding of existing and future land uses. Stakeholder consultation with State and local planning agencies is especially important to understand the likelihood of future land uses as detailed in strategic plans and to gauge the potential for unforeseen land use changes to occur. Consultation with these stakeholders can also be used to detail processes to change zoning of land, which can help assess the likelihood of land use changes occurring in the future.

Inquiries should not only be limited to planning agencies. A variety of government departments and agencies either own large amounts of land and/or can influence land use in the future (such as Defence, water and electricity companies/departments, urban renewal authorities, education and economic development departments).

Consideration should be given to engaging private development and planning stakeholders. This may enable a licensee to develop an understanding of areas that have not been flagged for development but are subject to speculation by the development community, with a long-term intention of advocating for its development.

The consultation process should also include the landowners and adjacent/surrounding landowners. Understanding landowners' future plans for their properties is an essential aspect of gathering information for input to the SMS process. There is the potential for a landowner's future plan to be inconsistent with the information gathered from planning stakeholders.

The land use investigation team should prepare a consultation strategy plan that clearly sets out the purpose of each consultation session and the areas of information that each stakeholder can usefully provide.

Multiple consultations with key stakeholders throughout the land use investigation will ensure information has been received, understood and interpreted correctly.

7 Land use assessment

Once an understanding of land use along a pipeline route has been developed, it should be assessed and documented. The process of assessing the information gathered during the desktop review and consultation components of the investigation is essential to forming a view on likely future land uses.

The assessment of the land under consideration should include:

- ownership patterns;
- current values (site and capital) and trends in land values;
- current uses and trends; and
- infrastructure and economic return.

This will ascertain:

- land uses that are under-performing; and
- the likely highest and best land use (ie the land use that provides the best economic return). This provides a good indication of land uses that are likely to be under pressure to change. Land on the fringes of townships and cities is most likely to be under pressure and the most likely future land use will be an urban use.

A detailed assessment allows the land use investigation to clearly set out current, permissible, proposed and possible future land uses for land in the vicinity of the pipeline route. Current and planned sensitive uses and major infrastructure should also be documented.

When documenting possible future land uses, an attempt should be made to assign probabilities, even if high level (high, medium, low), and timeframes to assist with risk assessment and pipeline design. An area that is assessed as having a medium probability of changing in the long term may be deemed an acceptable risk that addressed in the initial design.

As a further consideration, a pipeline's design life is often longer than the forward timeframes considered in planning documents. It is highly likely that a land use investigation will have to draw conclusions about future land use further out than the typical maximum 30-year outlook provided in high-level strategic planning documents.

8 Location Classification mapping

The location classifications defined in AS 2885 are qualitative in nature to allow them to be readily adapted to the wide range of planning jurisdictions that pipelines pass through.

The process of mapping location classifications to the land uses identified in a land use investigation should be rigorous and documented to ensure it can be understood in the future. It is recommended the location classification mapping exercise explicitly recognise the planning, land use and zoning definitions of relevant jurisdictions and map these definitions to location classifications. This will enable improved communication between the pipeline and planning stakeholders.

Particular attention should be paid to current, permitted and proposed and possible future land use, the likelihood of change and the potential for any change to impact the pipeline design. In rural regions, land that is currently used for agriculture purposes may already be zoned to allow subdivision to a density that would change a location classification from R1 to R2. A pipeline licensee will have to analyse the likelihood of this, and other possibilities (such as a rezoning), happening and the costs associated with managing the risk in initial design or at a later date.

Where future land use differs from existing land use and is readily identifiable (ie documented in a strategic planning document), location classifications must be based on the future land use. Where future land use is not readily identifiable, a pipeline licensee must use judgement when assigning location classification.