Visual Assessment Report

Wandoan Coal Project
Western coal seam methane water supply pipeline

A report prepared

Integral
landscape architecture
& visual planning

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This report was prepared by:

INTEGRAL
Landscape Architecture & Visual Planning

20/8 Bunton Street
Scarborough QLD 4020
Phone: 07 3880 0847
Fax: 07 3880 1659
john@ilavp.com.au

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Glossary

contrast	The degree to which a development component differs visually from its landscape setting
Integration	The degree to which a development component can be blended into the existing landscape without necessarily being screened from view
Screen	The degree to which a development element is unseen due to intervening landscape elements such as topography or vegetation.
Visual Effect	A measure of the visual interaction between a development and the landscape setting within which it is located
Visual Impact	A measure of a joint consideration of both visual sensitivity and visual effect that considered together determine the visual impact of a development
Visual Sensitivity	The degree to which a change to the landscape will be perceived in an adverse way
VMU	Visual Management Unit is a landscape area with similar visual characteristics

Executive summary

The Wandoan Coal Project proposes to develop thermal coal resources situated immediately west of the Wandoan township, located in Dalby Regional Council. That Project's requirement for raw water for processing purposes requires such supplies to be sourced from areas outside the MLA areas. The western coal seam methane (CSM) water pipeline is one of three potential raw water supply options.

This report evaluates the visual implications of the proposed western coal seam methane (CSM) water pipeline. This pipeline will supply raw water for production purposes to the Wandoan Coal Project. The 91 km pipeline generally follows existing road alignments between the Wandoan Coal Project MLA areas and Origin Energy's Spring Gully Reverse Osmosis Plant and associated infrastructure.

The visual assessment of the proposed pipeline project evaluated the condition of the existing landscape and the visual character of the proposed construction of the pipeline to determine visual effects. The visual sensitivity of views on to the pipeline was considered in terms of general land use and distances of potential sensitive receptors to the pipeline project. A consideration of these two factors, visual effect and sensitivity, determined impact levels.

Although high visual effects may be created during the construction process, this is limited in time and even views from sensitive receptors will experience little long-term effect or impact. The greatest visual effect will be created where there is a need to clear shrub and or tree cover, particularly along creek lines and flood plains.

Visual impact for this type of pipeline project is easily mitigated. Seven landscape mitigation strategies have been developed to ensure that significant visual impacts are avoided. Treatments relate to the easement, however if such treatment is not sufficient and in exceptional circumstance, treatment can be carried out at the point of viewing, such as a homestead adjacent to the pipeline easement. A limited number of air valves will be an above ground element but will only have localised effects, because of their small scale, that are easily mitigated.

1. INTRODUCTION

As part of the assessment of the Wandoan Coal Project on behalf of the Wandoan Joint Venture (WJV), Parsons Brinckerhoff (PB) has been commissioned to undertake a route selection for a proposed western CSM water supply pipeline (the Project) between the Wandoan Coal Project mining lease application (MLA) areas and Origin Energy's Spring Gully Reverse Osmosis Plant and associated infrastructure. The Project locality is shown in Figure 1-1. The proposed western CSM water supply pipeline forms one of three potential raw water supply options which are being considered for the Wandoan Coal Project. The other two potential raw water supply options will be investigated and reported in separate documents.

Parsons Brinckerhoff completed an assessment of six route options. This assessment led to Option 1 being defined as the preferred option.

This report prepared by Integral *landscape architecture and visual planning* addresses the visual and landscape aspects of the Western CSM Water Supply Pipeline Project along Route Option 1.

1.1 Project background

The Wandoan Coal Project proposes to develop thermal coal resources situated immediately west of the Wandoan township, located in the Dalby Regional Council area. The Wandoan Coal Project site is located approximately 350 km north-west of Brisbane and 60 km south of Taroom as shown in Figure 1-1. The coal reserves for the Wandoan Coal Project exist within the area of three mining lease applications (MLA), MLA 50229, 50230 and 50231 and will be developed as an open cut mine and related infrastructure. The Wandoan Coal Project covers an area of approximately 32,000 ha.

The mining of the coal resources will be developed using a combination of truck, shovel and excavator, dozer and dragline mining equipment. Coal will be mined at a rate of around 30 million tonnes per annum (Mt/a) run of mine (ROM) coal. The coal will be crushed, sized and washed before being transported by rail to ports in the Gladstone area.

The Wandoan Coal Project will include on-site coal handling and processing which will require a constant and reliable water supply. It is anticipated that water requirements at the Wandoan Coal Project will be typically less than 8,400 ML/a, with demand peaking at 9,100 ML/a. A potential water resource to help satisfy this demand has been identified at Origin Energy's Spring Gully Reverse Osmosis Plant and associated infrastructure.

Coal seam methane development involves extraction of methane from coal seams by reducing groundwater pressure that keeps the methane adsorbed to the coal. Water is the primary by-product of coal seam methane development and this water is often rich in salts and other constituents that render it unsuitable for many direct beneficial uses. The poor quality of the water makes the management of this water one of the major concerns associated with coal seam methane development.

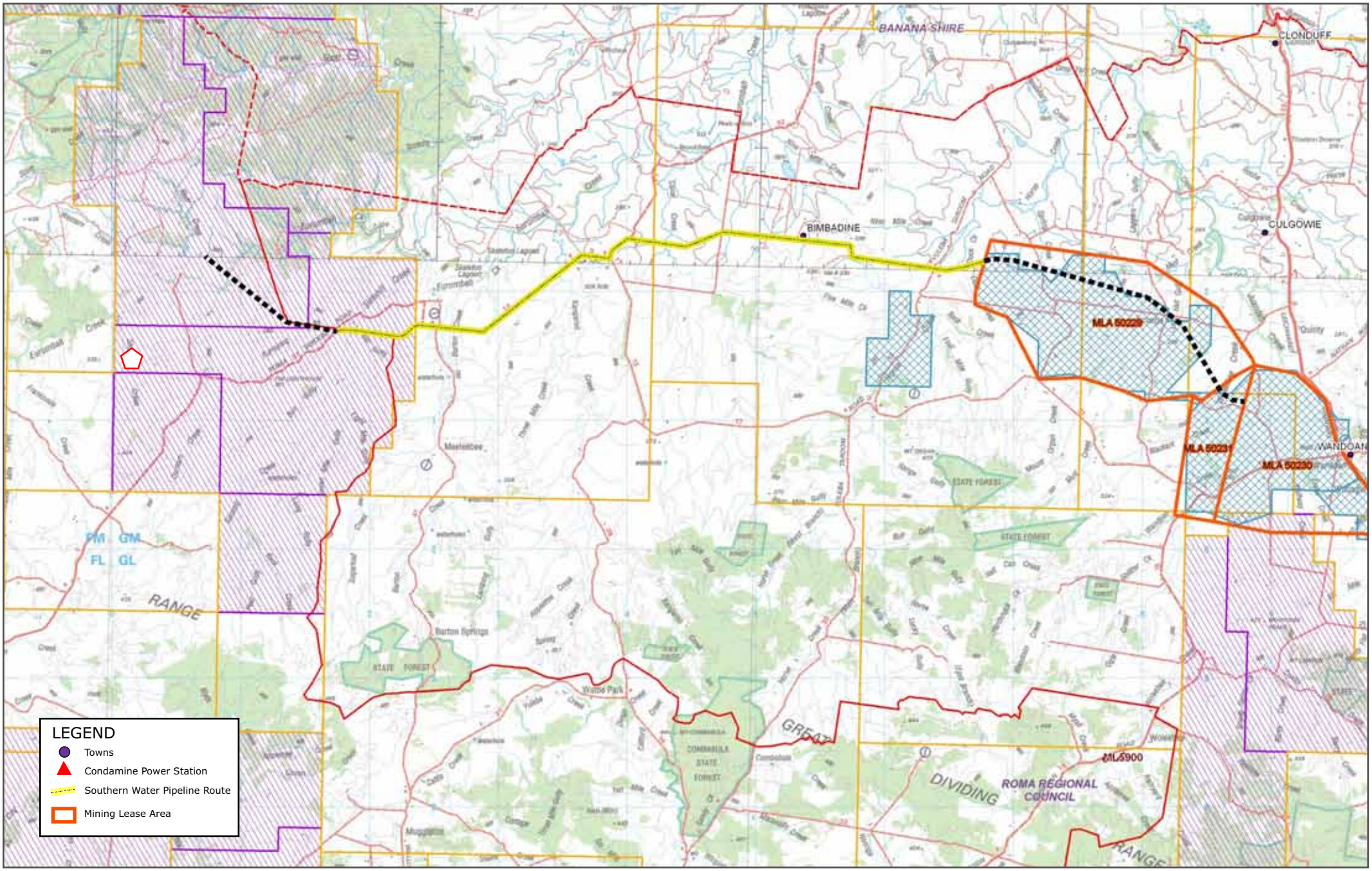


Figure 1-1
Project Location

However, in order to beneficially re-use coal seam methane water and secure a water supply for the Wandoan Coal Project, it is proposed to establish the western CSM water supply pipeline and pipe the water from infrastructure associated with the Spring Gully Reverse Osmosis Plant to the Wandoan Coal Project MLA areas. If necessary, treatment of the coal seam methane water to a standard suitable for use in coal handling and processing will be undertaken prior to the water leaving the Spring Gully Reverse Osmosis (RO) Plant and associated infrastructure.

Initial design concepts indicate that the pipeline will be 91 km in length and will require a single lift pump station at the point of supply nominated by Origin Energy, likely adjacent to the existing Spring Gully reverse osmosis plant. The pipeline will generally be located underground, constructed using a section trench and backfill method.

1.2 Description of study area

The existing land uses within the study area are predominantly agricultural and resource based. The proposed Wandoan Coal Project is located to the east of the study area. The Spring Gully and Fairview CSM extraction wells, operated by Origin and Santos, are located within the western portion of the study area, approximately 100 km to the west of Wandoan. The balance of land within the study area is utilised for agricultural purposes, including grazing and cropping activities.

The western portion of the study area is elevated and constitutes the foothills of the Carnarvon Range which is part of the Great Dividing Range. The plains within the central and eastern portions of the study area are generally open and slightly undulating traversed by a number of watercourses creating narrow alluvial plains.

The pipeline route alignment runs predominantly within the private properties to the north of road reserves. The roads adjacent to the pipeline route alignment are Goldens Bimbadeen Road and Roma-Taroom Road. These roads are narrow two-lane gravel carriageways with small bitumen sections.

Historical land-use patterns within the study area have resulted in significant clearance of vegetation. Frequent tree cover however is scattered throughout, often within the road reserves. This tree cover provides a degree of enclosure and containment of views.

There are a number of rural allotments of varying size, which support predominantly agricultural land use activities within the study area. Some of these rural residences may have views to the pipeline route across cropping and live-stock grazing lands.

2. METHODOLOGY OF ASSESSMENT

2.1 Relevant legislation and guidelines

The proposed pipeline, outside existing petroleum lease areas, is subject to assessment under the Queensland Integrated Planning Act, 1997 (IP Act) and Environmental Protection Act 1994 (EP Act). It is also subject to provisions of the Planning Scheme for the former Taroom Shire 2006 and the Planning Scheme for the former Bungil Shire Council 2006.

This visual assessment, see Figure 2-1, is part of an overall environmental assessment being completed by Parson Brinkerhoff to meet the requirements of the IP Act, EP Act and the local Planning Schemes. This was achieved by assessing the visual character of the receiving environments, the visual character of the development, location of sensitive receptors to define visual impacts and as needed develop landscape mitigation strategies.

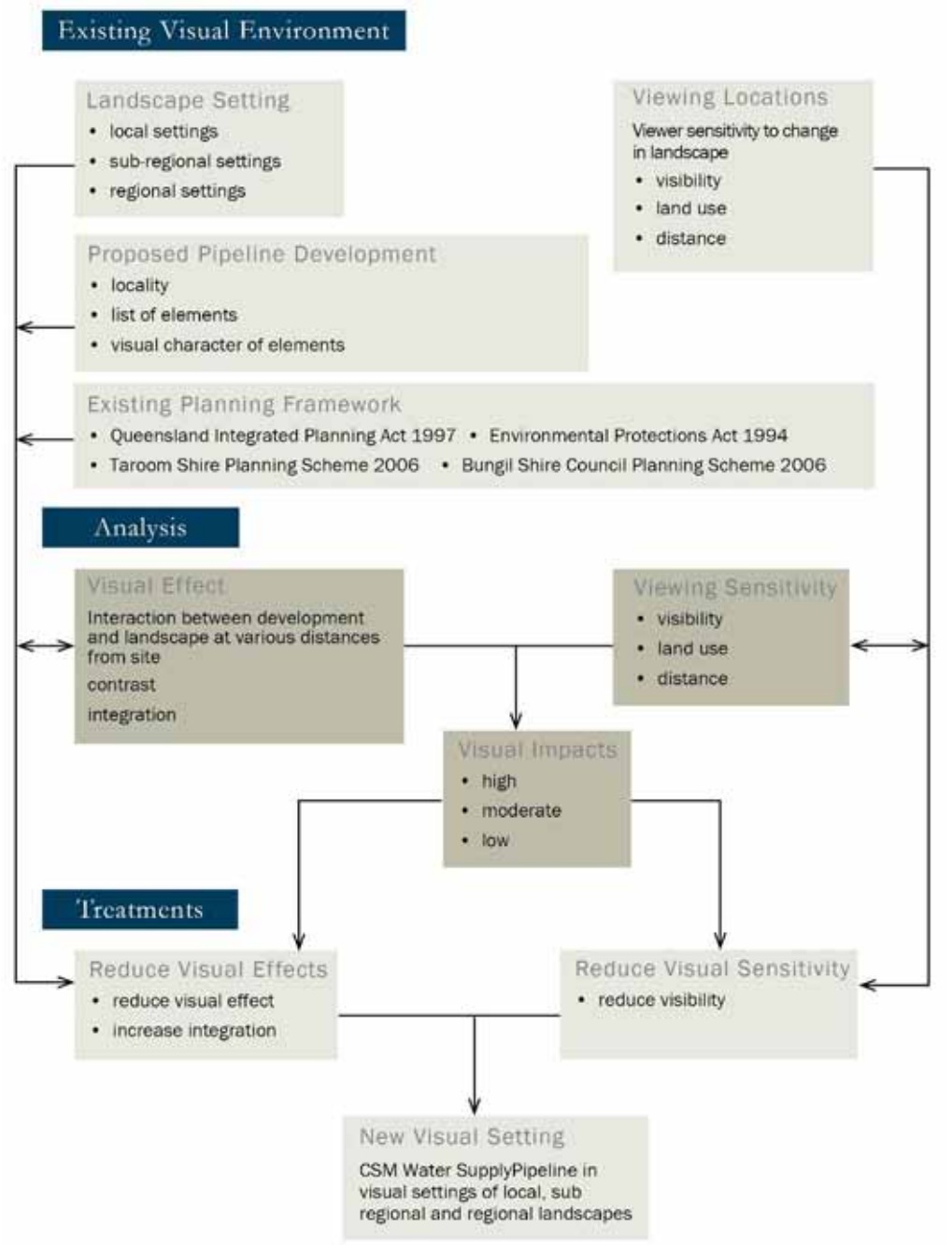


Figure 2-1: *Visual Assessment Methodology.*

2.2 How the study was conducted and information obtained

In order to review the visual significance and magnitude of the proposed project on the landscape, a baseline study was completed. The purpose of baseline studies is to record and analyse the existing character, quality and sensitivity of the landscape and any visual resources in the vicinity of the Project. On completion of the baseline study a comprehensive analysis and evaluation can be undertaken.

In general terms, there were four key stages to the landscape visual assessment study:

Stage 1: Desktop study

A desktop study of relevant background reports, aerial photography and mapped information was undertaken to collect data on topography, land use, field pattern and settlement pattern. This allowed an understanding of the proposed pipeline route and the landscape characteristics of the study area.

Stage 2: Fieldwork

A comprehensive field study was undertaken and photographic records obtained. The field survey was carried out on-site, by two people to gain a consensus opinion.

Field work was completed to collect visual data relating to landform, land use, vegetation, boundaries and more perceptual aspects like scale, enclosure and visual unity. At the same time information was collected on the condition of landscape features and elements that contribute to the overall character of the area.

Stage 3: Classification

This stage refined and finalised the desktop study and field work output by classifying the landscape into Visual Management Units (VMU). VMUs are large tracts of landscape based on locations of various roads, road segments and broad changes in landscape character.

Stage 4: Analysis and evaluation

The interaction of the visual character of the development and the visual character of the receiving environment create the visual effect of the Proposal. The type of land use of the visual receptors and distances from visual receptors to the pipeline defines the visual sensitivity to the project. When both visual effect and visual sensitivity are considered together the visual impact can be determined, see Figure 2-2.

These impact levels can be reduced by altering either visual effect or visual sensitivity. In the case of pipeline construction, the visual effects are generally greatly reduced following the completion of the construction phase. Visual sensitivity can be reduced as needed, by application of screening at viewing points. However, this is generally not needed for pipeline construction.

To assist in the appreciation of the visual effects of the proposed pipeline route and its interactions with various landscape settings, a series of photomontage imagery was completed.

Visual Effect	Visual Sensitivity		
	High	Moderate	Low
High	High visual Impact	High/Moderate Visual Impact	Moderate/Low Visual Impact
Moderate	High /Moderate Visual Impact	Moderate Visual Impact	Moderate/Low Visual Impact
Low	Moderate/Low visual Impact	Moderate/Low Visual Impact	Low Visual Impact

Figure 2-2: *Visual Impact.*

2.3 Limitations

The assessment was limited to the defined route and did not consider alternatives outside of the proposed pipeline route alignment.

Analysis of sensitive receptors was limited to evaluation of the aerial photo coverage. On-site assessment of these receptors was not always possible due to vegetation and in some locations topographic elements screening residences from roadside views.

Assessment was for the far greater part based on photographic data collected along the preferred option.

Assessment of the development was based on descriptions of the pipeline and construction techniques provided by Parsons Brinkerhoff.

3. EXISTING ENVIRONMENT

3.1 General

The country through which the pipeline route alignment passes are rural lands that are generally cleared or with scattered tree cover and open woodland tree cover along some creek and drainage lines.

The pipeline route crosses the topography in that its alignment is generally east-west and the dendritic pattern is north south. Within this context there are two major creek systems, Eurombah Creek and Horse Creek. Each of these creeks is feed by numerous other creeks and drainage lines and feed into the Dawson River. These drainage lines and adjoining lands are dominated by open red gum woodland that contrasts with adjoining rural lands because of the tree cover and creek lines.

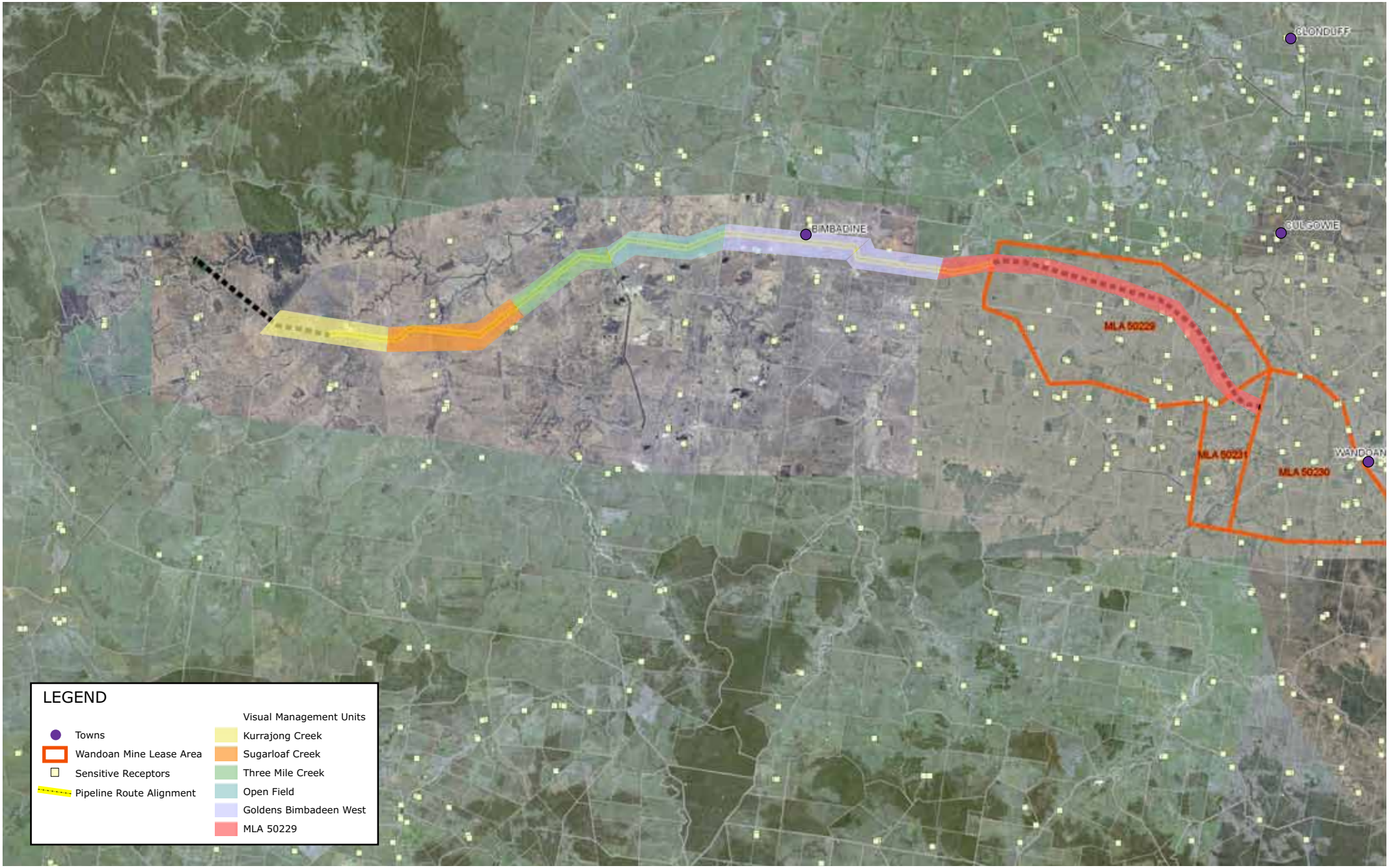
Topographic relief is limited and varies from 250-260m along creek lines to 280-300m on adjoining spurs and ridges. As a result of this, the roads and pipeline route cross this topography. The topography is such that the view sheds are generally limited to the roads themselves and the immediate adjoining lands.

View Sheds are defined by adjoining spurs that the road easements run between. These are often up to 3-5km apart and can be up to 10km apart. It is only within the creek woodlands that views are restricted.

Due to the similarity of the terrain and land cover, rather than establish visual character units (VCU) as is normally the case, Visual Management Units (VMU) have been established based on locations of various roads, road segments and open paddock locations, see Figure 3-1.

Local Visual Management Units include:

- Spring Hill Petroleum Lease Area VMU
- Roma to Taroom Road - Kurragong Creek Section VMU
- Roma to Taroom Road - Box Gully Section VMU
- Roma to Taroom Road – Three Mile Creek Section VMU
- Open Fields – Canal Creek Section VMU
- Golden Bimbadeen Road VMU
- MLA 50229 section VMU



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Kilometres

Figure 3-1
Visual Management Units

3.2 Visual Management Units

3.2.1 Spring Hill Petroleum Lease Area VMU

This section of the pipeline route is within the petroleum lease area. It consists of gently undulating topography with open grassland with scattered trees as land cover.

Just to the east of the Spring Gully RO Plant, the pipeline route crosses Eurombah Creek and proceeds in a south-easterly direction to the tributary that separates the main creek catchment from that of the adjoining Kurrajong Creek.

At the tributary, the pipeline route runs due east down to the Roma Taroom Road in that location. Again this section of the route consists of grazing land with scattered tree cover.

3.2.2 Roma Taroom Road / Kurrajong Creek VMU

In this VMU section, the route crosses though a number of creeks and gullies that are part of Kurrajong Creek. The slopes and crests tend to be cleared for the greater part, see Figure 3-2, with the creek and drainage lines having varying degrees of tree cover in the form of red gum woodland, see Figure 3-3.

This VMU has one homestead close to the alignment that would have a high sensitivity if the homestead is orientated to the pipe alignment.

The pipeline alignment is on the northern side of the road reserve in private property.

3.2.3 Roma Taroom Road / Sugarloaf Creek VMU

The road alignment crosses the main creek mid-way through the section. The road alignment is generally across the contour, leading into Sugarloaf Creek in the middle of the VMU, see Figure 3-4.

Road reserve areas to the north are generally clear as are the adjacent grazing lands.

There are two homesteads close to the road and pipeline alignment.

The pipeline is in grazing land on the northern edge of the road easement, see Figure 3-5.

Figure 3.2: *Most of the road reserves and adjoining lands are dominated by grazing lands with scattered low tree cover.*

Figure 3.3: *Creek lines are generally dominated by open River Red Gum Woodland that contrasts with the open grasslands with scattered trees away from creek lines*

3.2.4 Roma Taroom Road / Three Mile Creek VMU

Again this section includes creek crossings, with the main creek crossing occurring just to the north of a major billabong. These creek crossings and flats are generally dominated by red gum woodland, see Figure 3.4.

The other sections of the route are both along the contour and across it. However the gentle slopes within the VMU ensure that no side cuts are created by the road. Again the road reserves and lands adjoining are dominated by grazing lands with scattered tree cover, see Figure 3.5.

3.2.5 Open Fields / Canal Creek VMU

In this section the route crosses open fields between the Roma Taroom Road and Goldens Bimbaden Road, see Figure 3-8.

This VMU has scattered small tree and shrub cover over gentle slopes. The gentle terrain of the area is such that there has been no cut for road construction, therefore there will be no need for side cutting during construction of the pipeline.

3.2.6 Goldens Bimbadeen Road VMU

Goldens Bimbadeen Road is located along a tributary between Canal and Nine Mile Creeks, both draining west into Eurombah Creek. As with much of the pipeline route, this section of the pipeline alignment is dominated by grazing land with scattered tree cover. This unit differs from others to the west in that it does not cross creek lines. See Figures 3-9 and 3-10.

Figure 3.4: *Creekside locations support riparian strips and adjoining woodland*

Figure 3.5: *Road reserve and adjoining grazing lands are dominated by grassland with scattered low tree cover.*

Figure 3.6: *Creek lines within the VMU are generally dominated by open River Red Gum.*

Figure 3.7: *Away from creeks and flats, a more open landscape adjoins roadways and are dominated by grazing lands.*

Figure 3.8: *The pipeline route crosses open fields with scattered low tree cover.*

Figure 3.9: *Northern side of the road reserve and adjoining fields are dominated by grassland with scattered tree cover in some locations.*

Figure 3.10: *Northern side of road reserve and adjoining fields are dominated by grassland with scattered tree cover in some locations.*

3.2.7 MLA 50229 VMU

Within the MLA the route crosses across open grazing land with scattered trees. The route although not fixed is across the dendritic pattern. However due to the gentle terrain this will have little effect. There is more tree cover along the drainage lines. However, the openness of the woodland will allow for easy vehicle movement minimising the need for clearing.

Figure 3.11: *The open fields and the tree-lined creek typify some of the landscapes within the MLA.*

Figure 3.12: *Improved pasture and unimproved grazing land occur along the route adjacent to Booral Road.*

4. DESCRIPTION OF PROPOSED DEVELOPMENT

4.1 Route Alignment

A number of route options were considered by PB as part of the route selection process and option 1 was selected as the preferred option.

The pipeline route, see Figure 4-1, begins at the existing reverse osmosis (RO) plant at the Spring Gully coal seam methane fields and will traverse the existing petroleum leases (PLs) generally in a south-easterly direction. The alignment through the PLs has not as yet been finalised and will be the subject of future negotiations between the PL holders and the WJV. At some point within the PLs the alignment is proposed to intersect with the Roma-Taroom Road. The proposed pipeline then follows Roma-Taroom Road in a north-easterly direction until the north-western property boundary of Lot 9 on plan AB127. The proposed alignment then turns east along the property boundary between Lot 9 on plan AB127 and Lot 8 on plan AB127. The eastern 'L' section of Lot 9 on plan AB127 is proposed to be traversed to meet the Goldens Bimbadeen Road from which the proposed alignment travels east until the intersection with Ferrets Road. From this point, the proposed alignment continues in an easterly direction and utilises the southern property boundary of Lot 132 on plan SP121742. The south-eastern corner of this same allotment is then proposed to be traversed, then onto the south-western corner of Lot 58 on plan FT556 until it meets the western boundary of the Wandoan Coal Project MLA. The proposed alignment within the MLA area to the termination point at the proposed mine infrastructure area of the Wandoan Coal Project site is not yet finalised and will be determined dependent on the final mine layout in order to avoid proposed pit areas and other mine infrastructure.

Visual Significance

The visual significance of the pipeline location is that it determines the types of landscape that will be crossed and that creates the basis for landscape interaction and visual effect. Alignment is also significant in defining the relationship between the pipeline and potential sensitive visual receptors such as homesteads.

4.2 Pipeline Construction

The western pipeline will be approximately 91 km in length and will generally be located underground, constructed using a section trench and backfill method. Depth of cover will be between 0.6m to 1m and will vary subject to site specific conditions and land uses.

The pipeline will require a lift pump station at the Spring Gully RO Plant area. Air release points will be at high points along the pipeline at approximately 800m spacing as well as scour outlets at approximately 1 to 2km apart.

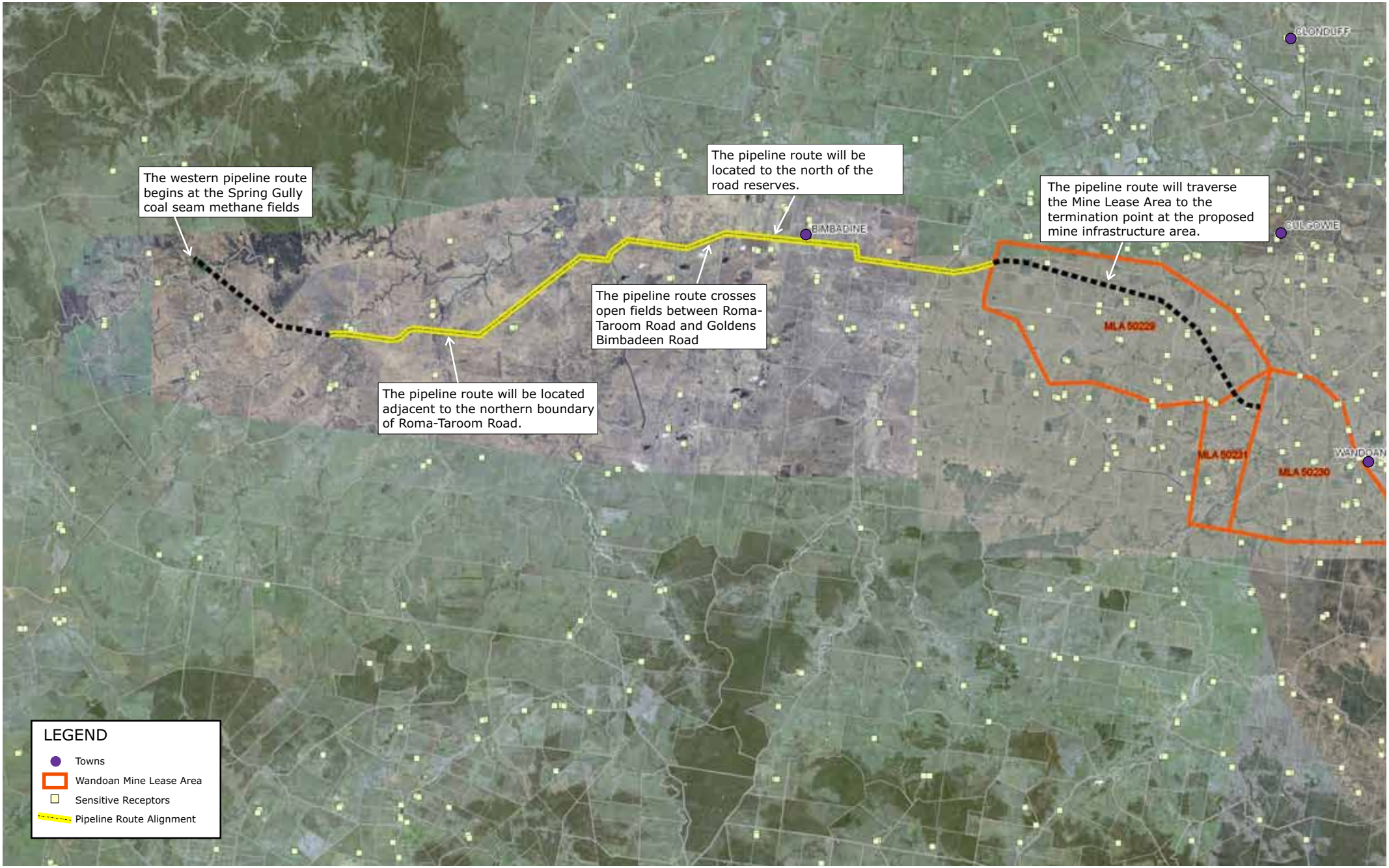

Figure 4-1
Western Pipeline Route Alignment

The construction corridor will be approximately 20m wide with the construction period of approximately nine months. Construction will involve delivery of pipe sections to lay down points along the pipeline route. Typical machinery used for pipeline construction and installation will involve delivery trucks for pipe, trucks for importing bedding sand, backhoe/excavator and mobile crane.

Visual Character of Pipeline Construction

The creation of a 20m wide construction footprint and the construction of a pipeline will contrast with the existing landscape settings through which the pipeline passes

The visual contrast between the pipeline construction and the adjoining landscape will be created by the removal of ground cover, be it grass or shrub cover. The resultant exposure and then excavation of the trench will create strong colour contrast with the adjoining landscape area. The extended linear character of this change through the landscape will create strong line contrast.

If tree cover occurs, the clearing of trees will also increase the level of contrast between the existing landscape and that of the pipeline easement creating a strong visual effect.

Much of the visual change is only experienced during the construction period as form and colour contrast is removed when restoration of ground cover is completed. Should there be tree removal associated with construction, the diminution of the visual change will not be as great, unless some tree restoration is undertaken off the pipeline alignment but along the edges of the easement.

5. POTENTIAL IMPACTS

Visual Impacts resulting from the pipeline in any location are a product of both visual effects and visual sensitivity as illustrated in Figure 2.2.

5.1 Visual Effects

Visual effects will result from the pipeline construction include the removal of ground cover in all locations and temporary earthworks associated with trenching. This removal of vegetation and topsoil will create a colour and minor form contrast to areas untouched and may detract from the landscape character of the roadway and surrounding landscape settings. This contrast, at least during the construction phase will also create a strong line in the landscape and a high visual effect. This will however reflect the alignment of roadways and fence lines in a locality.

In some locations, in addition to disturbance of ground covers, there will also be removal of shrub, including Brigalow and tree cover generally in the form of scattered trees or open woodland along creeks, drainage lines and flood plains. This will increase the level of contrast and depending on the extent of “feathered edge” to the vegetation clearing may create longer term linear elements in the landscape.

The construction of the pipeline will require up to 20m clear space. This will allow for trenching equipment, pipe laying equipment as well as pipe delivery truck and general vehicle movement. However where possible, vegetation clearing will be restricted to less than 20m.

The removal of grass, trenching, etc is temporary and the visual effect of this is removed once restoration and re-grassing is accomplished. However where woodland or dense shrub is removed the linear effect of vegetation clearing will be more long lasting.

The visual effects of the pipeline construction have been illustrated in Figures 5-1 – 5-3. These photomontages illustrate the visual effects in different visual settings along the pipeline route.

Visual effects will in the short term be high due to strong contrast created by ground cover removal, trenching and pipe laying activity. However this visual effect is short term and is reduced to low once restoration and re-grassing has been completed.

In treed areas visual effects will remain at moderate levels where there is a strong edge to vegetation clearing. Otherwise similar low visual effect levels will be experienced once ground covers are re-established.

Visual Effects may also stay at a somewhat elevated level if there is a restriction to management of the easement and that this will create a linear visual difference between the easement and adjoining farm areas.

5.2 Visual Effects as illustrated by Photomontage

The visual effect of the pipeline along the western alignment have been illustrated by a number of photomontage. The location of the view points is illustrated in Figure 5.1.

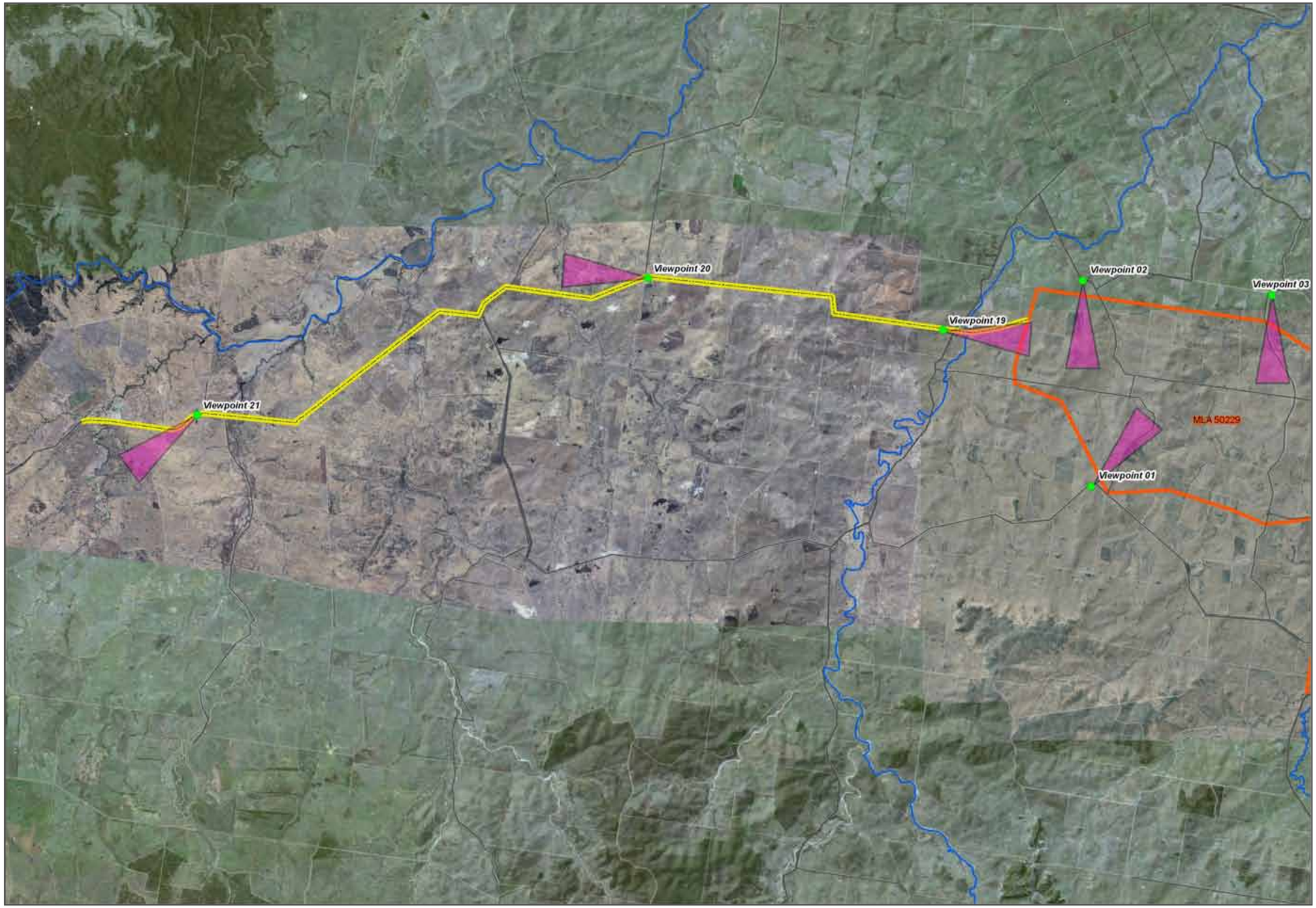

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Figure 5-1
Photomontage Viewpoint Locations
A series of photomontage images illustrating what is seen of the pipeline works has been completed from various vantage points along the pipeline route.

5.2.1 Figure 5.2 - Grazing areas east of Golden Bimbadeen Road

In this location the pipeline route crosses grazing lands to the west of the MLAs. In this location the pipeline also crosses Horse Creek that is defined by the Red Gum Woodland along the creek line, see figure 5.3a. The selected route utilises a break in the creek line trees to ensure that tree clearing is avoided in this location, Figure 5.3b.

The visual effect is created by the disturbance to the pattern of grassland and sedges in this locality. While this will pattern will take some time to re-establish the visual effect is considered to be low following the completion of pipeline construction and restoration.

5.2.2 Figure 5.3 - Open Fields to the south of Golden Bimbadeen Road

In this locality the pipeline crosses open fields to the south of Golden Bimbadeen Road. The existing visual setting is dominated by grassland with scattered tree cover, see Figure 5.3a. Construction of the pipeline will create a temporary change in the visual setting, see Figure 5.3b but this effect, see Figure 5.3b is short lived until grass cover is restored over the newly laid pipeline.

The visual effect of the pipeline in this situation is low.

5.2.3 Figure 5.4 - Roma Taroom Road

At this location the pipeline passes through an open field, see figure 5.4a. The construction works for the pipeline will create a temporary line in the landscape that is created by the colour contrast of the soil against the existing grassland, see Figure 5.4b. This visual effect is temporary.

The visual effect of the pipeline construction in this location is low following completion of restoration works.

Figure 5-2a
Location 19 - Goldens Bimbadeen Road, crossing of Horse Creek | existing
The pipeline alignment has been finalized to utilize gaps within the trees that are part of the Riparian vegetation adjoining Horse Creek in this locality

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Figure 5-2b
Location 19 - Goldens Bimbadeen Road, crossing of Horse Creek | proposed pipeline

Figure 5-3a
Location 20 - Open Fields west of Golden Bimbaden Road | existing
The visual effect of a pipeline in an open paddock is minimal once grassland is restored over the construction strip.

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Figure 5-3b
Location 20 - Open Fields west of Golden Bimbaden Road | proposed pipeline

Figure 5-4a
Location 21 - Roma Taroom Road | existing
The visual effect of the pipeline in this location is minimal as it crosses open grassland. However some trees are removed from the tree line adjoining the paddock.

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Figure 5-4b
Location 21 - Roma Taroom Road | proposed pipeline

5.3 Visual Sensitivity

Visual sensitivity to the pipeline construction, that will only be constructed during the day, is due to two sources, views from the adjacent roadways and from adjoining homesteads and farm areas.

The Roma Taroom Road is considered to have moderate sensitivity, given its regional linkage status, while other roads are considered to have low sensitivity due to their local road status.

Views from homesteads are considered to have potentially high visual sensitivity, while adjoining farm lands have low sensitivity. The locations of homesteads close to the pipeline route are illustrated in Figure 5.5.

5.4 Visual Impacts

Visual Impacts in the short term during the construction period will be moderate to high due to the high visual effect levels and close proximity of the road and potentially some homesteads.

However this impact will reduce to low when restoration and ground cover vegetation is restored. This will also be the case in treed areas unless a strong edge is created in the clearing process. In such cases a moderate visual impact may continue as it relates to the roadway. A high impact may remain if there are homestead views along such a clearing line for some distance. The latter scenario is unlikely given the nature of the terrain, vegetation structure and the visual orientation of homesteads.

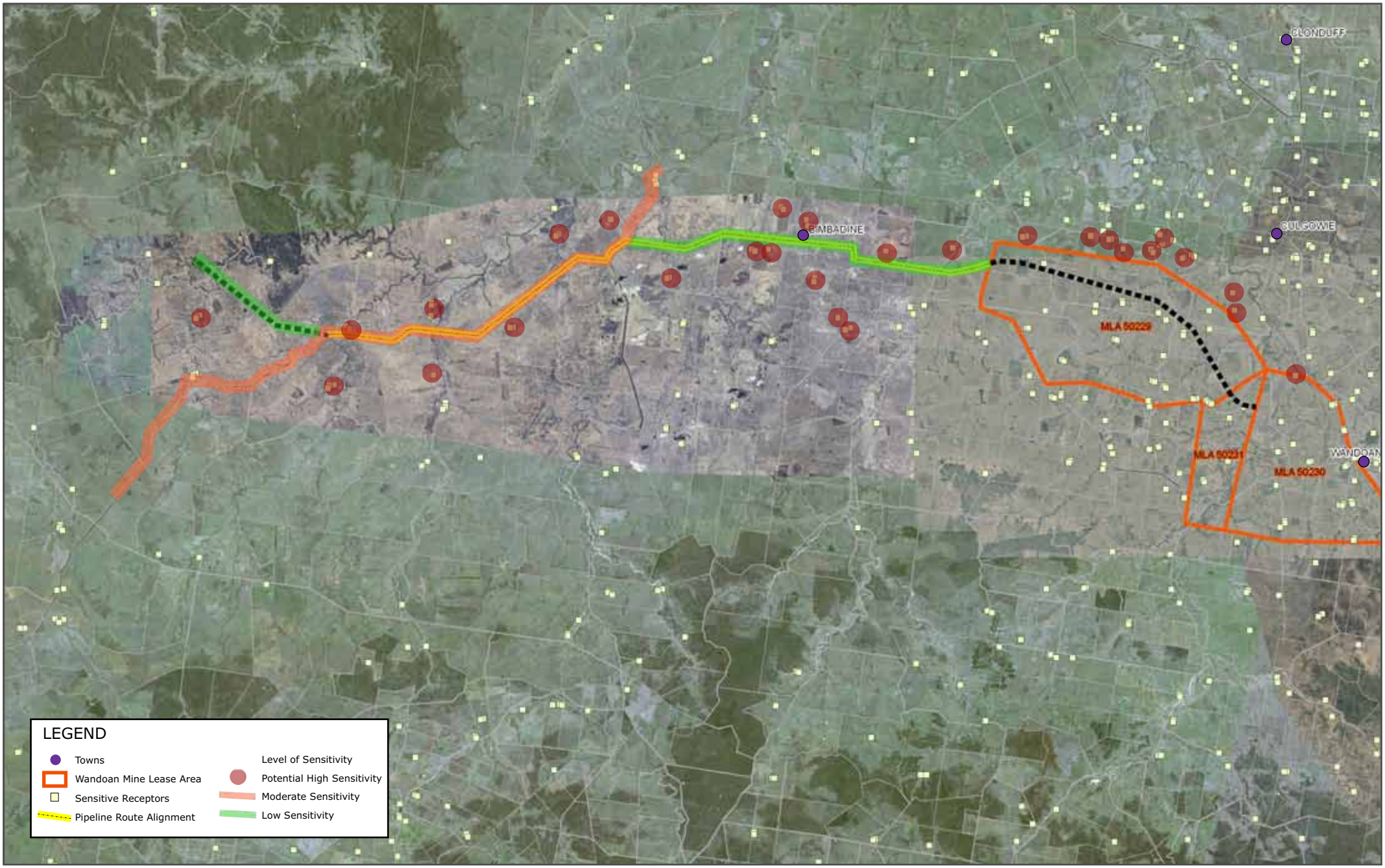

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Figure 5-5
Potential Sensitive Receptors

6. MITIGATION MEASURES

6.1 General

Visual mitigation strategies will reduce the visual effect of pipeline construction and aim to reduce contrast created by clearing and earthworks.

Visual mitigation strategies include:

- Easement location
- Minimise easement clearing
- Sectionalising work areas
- Fragmenting construction functions in easement by multiple use of the same easement area, e.g. for truck movements and then for trenching where this is possible in sensitive locations
- Management of topsoil
- Pest management (especially of weed and other invasive species)
- Re-establishment of ground cover
- Re-establishment of shrub and tree cover
- Screening of sensitive receptors.

6.2 Sectionalising Work Areas

The establishment of a pipeline has the potential to create a high visual effect along the length of the pipeline. Establishing the pipeline in sections to enable early restoration will minimise the length of impact and the time over which it is experienced.

6.3 Minimise Easement Clearing

Although an easement width of 20m will be established, not all of this easement may need to be cleared in sensitive locations. In may not be necessary in all locations to clear this width. Apart from basic operations of trench construction, pipe delivery, pipe laying, backfilling and restoration, all other operations such as pipe lay down areas and storage areas should avoid sensitive areas.

Further as needed staggering of operations in sensitive locations may remove the need to clear wide easement areas.

6.4 Fragmenting Construction Easement Functions

The construction easement is required for many functions that will be carried out simultaneously. This will include trenching, trucking in pipes, placing bedding materials, laying the pipe and backfilling. The functions that are not immediately involved with trenching are usually immediately adjacent to the trench, such as trucking in pipes.

It is suggested that in sensitive locations where heavy tree cover is found that, as needed, this function and others like it could be moved laterally. This would minimise tree clearing and help to achieve the “feathered easement” edge that will avoid the creation of a visual gun barrel through wooded areas.

6.5 Feathering Easement Clearing

Where there are long and sensitive views along easements it may be possible to “feather” the easement edge to prevent hard and regular edges to clearings.

This would require marginal under-clearing in some locations to provide variety to areas that are cleared to the maximum width.

6.6 Managing Topsoil

Management of topsoil and surface mulch so that it can be reused when trenching has been completed will allow for topsoil nutrient, micro flora and fauna and seed to assist in the rehabilitation process. Similarly existing mulch will contain indigenous seed and provide good ground cover during rehabilitation.

6.7 Re-establishment of Ground Cover

In most cases, and unless indicated otherwise by ecology studies, initial restoration will involve the establishment of grass cover. This should be of the type that occurs in adjoining field areas or, in the case of bushland areas, where mulch is not used, sterile grasses that will provide soil protection values.

This will reduce the major visual effect created by colour contrast between exposed soil and adjoining grasslands or other vegetation types.

6.8 Pest management (especially of weed and other invasive species)

Effective management of invasive species as part of ground, shrub and tree cover re-establishment will preserve the visual amenity and value of the land. Pest management strategies are detailed in Chapter 17 and associated technical reports.

6.9 Re-establishment of Shrub and Tree Cover

Re-establishment of shrub and tree cover should be completed according to the prescriptions outlined by ecological studies. Such restoration will remove the more subtle contrast factor between the pipeline easement and the adjoining vegetation. While it is appreciated that the reestablishment of large trees on the pipeline is not desirable, use of indigenous shrubs and small trees will remove the linear visual effect of clearing through native vegetation.

Should cultural planting, such as those found along homesteade driveways, be removed, such plantings should be re-established in close proximity based on mutual agreement with the landowner.

6.10 Screening of Sensitive Receptors

In the unlikely circumstance that a homestead is adversely affected by the post re-habilitated landscape, plantings should be carried out adjacent to the affected viewing area to provide screening of visual integration of the affected landscape.

7. RESIDUAL IMPACTS

It is considered that there will be no significant residual visual impact created by the pipeline construction. This is due to the underground location of the pipeline and the ability to restore surface areas to blend in with the adjoining landscapes.

Even where tree clearing is needed, it is considered that the open woodland character of the landscapes and the unlikelihood of critical view lines being parallel to such clearings would minimise potential for lasting high visual impacts.

If critical and ongoing visual impacts are created in isolated situations, the implementation of mitigation strategies including at viewing points and landscape treatments will ensure that no significant residual visual impacts are experienced.

8. CONCLUSIONS

The western coal seam methane water supply pipeline generally follows road alignments outside of Origin Energy's Petroleum Lease Area and that of the Wandoan Coal Project MLA areas. This alignment generally avoids sensitive landscapes and has only localised visibility to adjacent road users and properties.

The character of the buried pipeline development ensures that visual impact is for the greater part limited to the construction process. Easily achieved landscape mitigation strategies will further limit any potential impact.

The limited time of the construction process and ability to restore landscape values as well as limited visibility to sensitive receptors ensure that the visual impacts of the project are not significant and can be appropriately mitigated.